NAVFAC SOUTHEAST

# SUPPLEMENTAL PACKAGE B

## SOF RIVERINE AND COMBATANT CRAFT OPERATIONS FACILITY

**N 62467-05-D-0096**

**FINAL DESIGN ISSUE**
**SEPTEMBER 4, 2009**

**US DEPARTMENT OF THE NAVY – NAVFAC SOUTHEAST**

*Prepared by:*
Dammon Engineering
1095 Florida Avenue
Slidell, La. 70458
985-649-5832
dammonengineering.com

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Dammon # 30



REVIEWED FOR APPR. MDE 13 FEB 09

# VP Buildings

3200 Players Club Circle
Memphis, TN 38125-8843

# STRUCTURAL DESIGN DATA

Project: Riverine and Combatant Craft Operations Facility
Name: 08-28914 EP1
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County: Hancock
Country: United States

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STEPHEN L. CARR REGISTERED PROFESSIONAL PE. 11895 STATE OF MISSISSIPPI ENGINEER

Project Name: Stennis Riverine
Contract: N6945O-05-D-0096
Brem Proj.: 3013-70
Submittal: 13125-06
Reviewed
Reviewed by: J. Collins
Date: 2/17/09

## Letter of Certification

Contact:
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

This is to certify that the above referenced VP BUILDINGS project has been designed for the applicable portions of the following Building Code and in accordance with the order documents which have stipulated the following applied environmental loads and conditions:

**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Operations Building | 58/0/0 | 120/6/0 | 6989 | 8153 | 8461 | 24/7/0 | 24/7/0 | 5.000:12 | 5.000:12 | 36/8/0 |
| Operations Building Lean-to | 27/6/0 | 58/0/0 | 1595 | 1796 | 1791 | 22/10/0 | 13/8/0 | 4.000:12 | | |
| Total For All Shapes | | | 8584 | 9949 | 10252 | | | | | |

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Operations Building : Mezzanine 1 @ 12/9/0**

| Floor Type | Non-Composite | Loading Type | Office |
|---|---|---|---|
| Top of Floor | 12/9/0 | Floor Dead Load | 50.00 psf |
| Total Thickness of Deck + Topping | 0/3/0 | Floor Live Load | 100.00 psf Not Reducible |
| Top of Joist | 12/6/0 | Collateral Load | 5.00 psf |
| Min. Clearance from Floor to Joist | 11/4/0 | Partition Load: | 10.00 psf |
| Min. Clearance from Floor to Rafter | 9/6/0 | Floor Live Load Deflection | 360 |
| Mezzanine Category | Entire Floor | Floor Dead + Floor Live Deflection | 240 |
| Bracing Category | Unbraced | | |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour

Building Use: Standard Occupancy Structure

Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf

Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

The steel design is in accordance with VP BUILDINGS standard design practices, which have been established based upon pertinent procedures and recommendations of the following organizations:

American Institute of Steel Construction (AISC)
American Iron and Steel Institute (AISI)
American Welding Society (AWS)
American Society for Testing and Materials (ASTM)
Canadian Standards Association
CSA W59-Welded Steel Construction
Limit State Design of Steel Structures
Metal Building Manufacturers Association (MBMA)
VP Buildings is certified by:
- CSA A660 Certified (Design and Manufacturing)
- IAS Approved Fabricator
- Canadian Welding Bureau Div. 1 Certified

VP Buildings has designed the structural steel components of this building in accordance with the Building Code, Steel Specifications, and Standards indicated above. Steel components are designed utilizing the following steel grades unless noted otherwise:

3 Plate members fabricated from plate, bar, strip steel or sheets
ASTM A529, A572, A1011 - All Grade 55 ksi
Hot Rolled Shapes (W, S, C, Angles, etc)
ASTM A36, or ASTM A36Mod50, A529, A572, A588, A709, A992-All Grade 50 ksi
Tube and Pipe Sections ASTM A500, Grade B (Fy - 42 ksi pipe, Fy - 46 ksi tube)
Light Gage Sections ASTM A1011 SS Grade 55 ksi, A653 SS Grade 60 ksi
Round Rod Bracing ASTM A572 Grade 50 ksi

This certification DOES NOT apply to the design of the foundation or other on-site structures or components not supplied by VP BUILDINGS, nor does it apply to unauthorized modifications to framing systems provided by VP BUILDINGS.

Furthermore, it is understood that certification is based upon the premise that all components furnished by VP BUILDINGS will be erected or constructed in strict compliance with pertinent documents furnished by VP BUILDINGS.

Sincerely,

REGISTERED PROFESSIONAL ENGINEER PE. 11895 STATE OF MISSISSIPPI

_____ P.E. Prepared by: MDE Reviewed by: _____

VP BUILDINGS
3200 Players Club Circle, Memphis TN 38125-8843

## Building Loading - Summary Report

### Shape: Operations Building

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

**Operations Building : Mezzanine 1 @ 12/9/0**

| Floor Type | Non-Composite | Loading Type | Office |
|---|---|---|---|
| Top of Floor | 12/9/0 | Floor Dead Load | 50.00 psf |
| Total Thickness of Deck + Topping | 0/3/0 | Floor Live Load | 100.00 psf Not Reducible |
| Top of Joist | 12/6/0 | Collateral Load | 5.00 psf |
| Min. Clearance from Floor to Joist | 11/4/0 | Partition Load: | 10.00 psf |
| Min. Clearance from Floor to Rafter | 9/6/0 | Floor Live Load Deflection | 360 |
| Mezzanine Category | Entire Floor | Floor Dead + Floor Live Deflection | 240 |
| Bracing Category | Unbraced | | |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |

| | | | | |
|---|---|---|---|---|
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SS | D + CG + S + SS |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 12) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 12) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 8 and 9) |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 9 and 10) |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 10 and 11) |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 11 and 12) |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |
| 4 | System | 1.000 | 0.700 E> | E> |
| 5 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations - Roof - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 L | D + L |
| 2 | System | 1.000 | 1.0 D + 1.0 S | D + S |
| 3 | System | 1.000 | 1.0 D + 1.0 S + 1.0 SD | D + S + SD |
| 4 | System | 1.000 | 1.0 D + 1.0 S + 1.0 SS | D + S + SS |
| 5 | System | 1.000 | 1.0 D + 1.0 US1* | D + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 *US1 | D + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 W1> | D + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 <W2 | D + <W2 |
| 9 | System | 1.000 | 0.600 D + 1.0 W1> | D + W1> |
| 10 | System | 1.000 | 0.600 D + 1.0 <W2 | D + <W2 |

**Design Load Combinations - Wall - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 14 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 15 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 18 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 19 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 20 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 23 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 24 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 25 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 26 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 27 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 28 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 S + 1.0 SD | S + SD |
| 6 | System | 1.000 | 240 | 1.0 S + 1.0 SS | S + SS |
| 7 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 8 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 9 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 0.500 <E | <E |

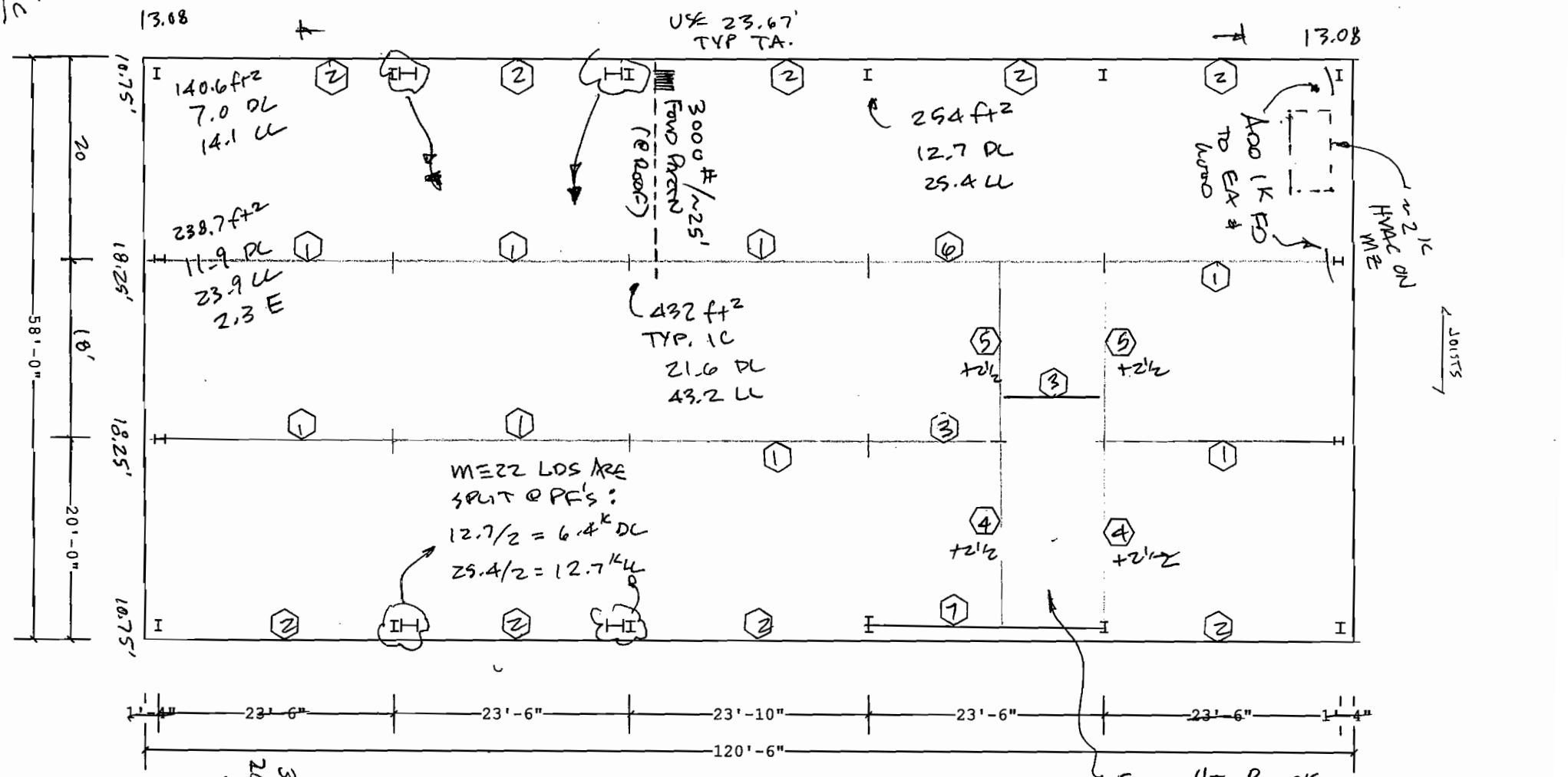
**Deflection Load Combinations - Roof - Panel**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 1.0 S | S |
| 2 | System | 1.000 | 150 | 150 | 1.0 S + 1.0 SD | S + SD |
| 3 | System | 1.000 | 150 | 150 | 1.0 S + 1.0 SS | S + SS |
| 4 | System | 1.000 | 150 | 150 | 1.0 US1* | US1* |
| 5 | System | 1.000 | 150 | 150 | 1.0 *US1 | *US1 |

**User Applied Surface Loads (Local Coordinate System)**

| Side | Shape | Units | Type | Description | Mag | X-Loc | Y-Loc | Frm | Brc | Grt | Pur | Pnl | Supp. | Dir. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | LN | plf | CG | Folding Partition | 120.00 | 69/0/0 | -2/0/0 | Y | N | N | N | N | N | IN | OF |
| B | LN | plf | CG | Folding Partition | 120.00 | 69/0/0 | -27/0/0 | Y | N | N | N | N | N | IN | OF |
| B | PT | k | CG | Folding Partition (open) | 3.00 | 69/0/0 | -24/0/0 | Y | N | N | N | N | N | IN | OF |

LOADING WORKSHEETS
& MEZZANINE
CALCS FOLLOW →




• PT. LOS @ 12.5' EL

AUX COL TUBE - MAX P = 36.2 + 32.6 = 68.8

L ≤ 11' ⇒ TS 5 x 5 x 1/4 MIN.
(CAP = 86.5, #4-ST)

INT. SEISMIC-LONGIT.
V = 120.5 (18.25) (50/1000)
= 110.0 K
V = 110 (.042) = 4.6
+ ADD 2.3K @ EA OF (4) ENDPOST/LC
@ PF: 4.6 / 10.75 = ~ 7K

FL. DL
3" C = 27 #
2@ADK = 2 #
JOIST = 3 #
BMS ≤ 3 #
35 #
(< 50, ∴ CAN 5# CAP. ING IN SO')

FULL HT BLOCK ENCLOSES STAIR TOWER, TO BE SAFE, BEAMS AT PERIM STILL GET "HANGING" LOADING.

# ENGINEERING DATA SHEET

VP BUILDINGS
VARCO-PRUDEN
Arkansas Service Center
P. O. Box 6868
Pine Bluff, Ar. 71611
Phone: (870) 534-6030
Fax: (870) 540-1638

FLOOR BEAMS — 18" MAX DEPTH

| | |
|---|---|
| Page: | 1 of |
| Job #: | 08-28914 |
| Date: | 4 FEB 09 |
| By: | |

1 SPAN ≤ 23.8' TA = 18.25 $w_{TL} = .15(18.25) = 2.74$ klf

L/240 TTL LD = 1.2" MX = 2328 in-k, V = 32.6

IR = 568 $L_y = lb \leq 5'$ (≈2')

USE: 1/2 X 8 X 3/16 X 18

2 SP = 23.8 TA = 10.75 w = 1.61 klf

L/240 = 1.2" MX = 1370, V = 19.2

IREQ = 334 $L_y = lb \leq 5'$

USE: 1/2 X 6 X 3/16 X 18

3 SP ≤ 13.2' TA ≤ 38/2 = 19' w = 2.85 klf

L/240 = .66" MX = 745 V = 18.8

IREQ = 102 $L_y = lb \leq 5'$

USE: 5/16 X 6 X 1/8 X 11

4 SP ≈ 18.5' TA ≤ 14.2/2 = 7.1 w = 1.07 klf

L/240 = 0.93 MX = 549 V = 9.9

IR = 105 $L_y = lb \leq 12'$ (USED LARGER VALUE DUE TO UNCERTAINTY RE: STAIR SUPPORT. DECKING CONN. DIRECTLY TO BEAM IS EQ SOME SUPPORT)

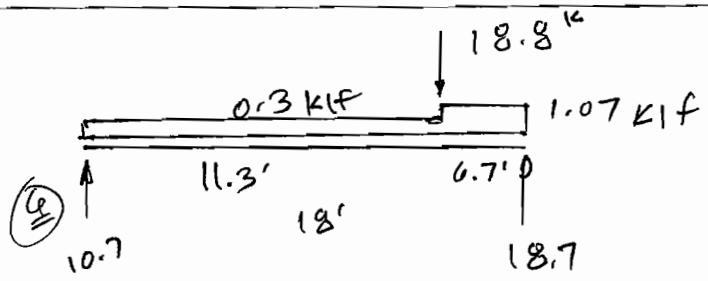
USE: 5/16 X 6 X 1/8 X 12

VP BUILDINGS
VARCO-PRUDEN

**ENGINEERING DATA SHEET**
Arkansas Service Center
P. O. Box 6868
Pine Bluff, Ar. 71611
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| | |
|---|---|
| Page: | 2 of |
| Job #: | |
| Date: | |
| By: | |

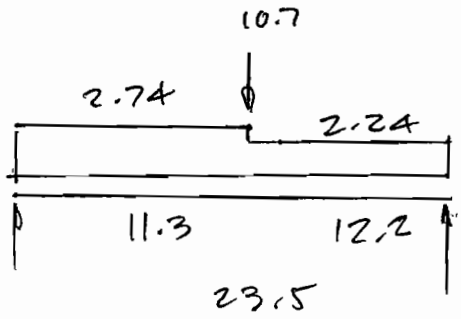
5




$M_x = 1214$
$V = 18.6$
$L_x = l_b = 11.3'$

USE: 3/8 X 8 X 3/16 X 14

4

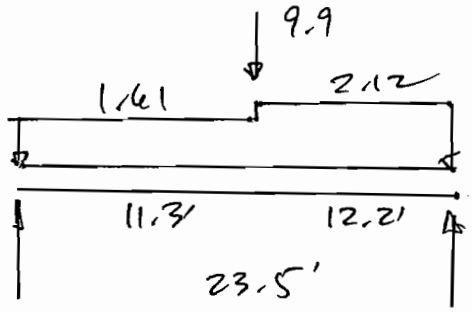



$M_x = 2800$
$V = 36.2$
$L_y = l_b \leq 5'$

11.25
18.5
29.8/2
*.15
2.24 klf

USE: 1/2 X 8 X 1/4 X 18

7




$M_x = 2240$
$V = 28.2$
$L_y = l_b = 12.2$

6.25
+18.5
/2
+1.5
*.15
= 2.12 klf

USE: 5/8 X 8 X 3/16 X 18

Mz Bm #1

```
 Design Data:
     AXIAL      =   -1.00 K
     SHEAR      =   32.60 K
     X MOMENT   = 2328.00 "-K
     KLX        =   23.80 FT
     KLY        =    5.00 FT
     LB         =    5.00 FT
     RT         =    0.00
     CB         =    1.00
     CMX        =    1.00
     FLANGE FY  =   55.00 KSI
     WEB FY     =   55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.5000 X  8.0 FLG   0.1875 WEB   18.00 DEPTH
     AREA   =   11.19
     IX     =  689.43    SX =  76.60    RX =   7.85    ZX =  83.55
     IY     =   42.68    SY =  10.67    RY =   1.95    ZY =  16.15
     QS     =    1.00
     QA     =    0.85
     WEIGHT =   38.07 #/FT

     FORCES
     ACTUAL P =     1.00 K        ALLOWABLE P =   295.92 K
           MX =  2328.00 "-K                MX =  2462.31 "-K
            V =    32.60 K                 V =    32.36 K
     COMBINED STRESS RATIO =  0.897
     SHEAR    STRESS RATIO =  1.007
```

Mz Bm #2

```
 Design Data:
     AXIAL      =    -1.00 K
     SHEAR      =    19.20 K
     X MOMENT   = 1370.00 "-K
     KLX        =    23.80 FT
     KLY        =     5.00 FT
     LB         =     5.00 FT
     RT         =     0.00
     CB         =     1.00
     CMX        =     1.00
     FLANGE FY  =    55.00 KSI
     WEB FY     =    55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.5000 X  6.0 FLG   0.1875 WEB   18.00 DEPTH
     AREA   =    9.19
     IX     =  536.27    SX =  59.59    RX =   7.64    ZX =  66.05
     IY     =   18.01    SY =   6.00    RY =   1.40    ZY =   9.15
     QS     =    1.00
     QA     =    0.83
     WEIGHT =   31.26 #/FT

     FORCES
     ACTUAL P =     1.00 K        ALLOWABLE P =   229.19 K
           MX =  1370.00 "-K                MX =  2158.83 "-K
            V =    19.20 K                 V =    32.36 K
     COMBINED STRESS RATIO =  0.637
     SHEAR    STRESS RATIO =  0.593
```

Mz Bm #3

```
 Design Data:
     AXIAL      =    -1.00 K
     SHEAR      =    18.80 K
     X MOMENT   =   745.00 "-K
     KLX        =    13.20 FT
     KLY        =     5.00 FT
     LB         =     5.00 FT
     RT         =     0.00
     CB         =     1.00
     CMX        =     1.00
     FLANGE FY  =    55.00 KSI
     WEB FY     =    55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.3125 X  6.0 FLG    0.1345 WEB    11.00 DEPTH
     AREA   =     5.15
     IX     =   119.63     SX =  21.75     RX =   4.82     ZX =  23.66
     IY     =    11.25     SY =   3.75     RY =   1.48     ZY =   5.67
     QS     =     1.00
     QA     =     0.88
     WEIGHT =    17.51 #/FT

     FORCES
     ACTUAL P =      1.00 K          ALLOWABLE P =   138.74 K
           MX =    745.00 "-K                MX =   753.30 "-K
            V =     18.80 K                   V =    19.60 K
     COMBINED STRESS RATIO =  0.993
     SHEAR    STRESS RATIO =  0.959
```

Mz Bm #4

```
 Design Data:
     AXIAL      =   -1.00 K
     SHEAR      =    9.90 K
     X MOMENT   =  549.00 "-K
     KLX        =   18.50 FT
     KLY        =   12.00 FT
     LB         =   12.00 FT
     RT         =    0.00
     CB         =    1.00
     CMX        =    1.00
     FLANGE FY  =   55.00 KSI
     WEB FY     =   55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.3125 X  6.0 FLG   0.1345 WEB   12.00 DEPTH
     AREA   =    5.28
     IX     =  144.59    SX =  24.10    RX =   5.23    ZX =  26.26
     IY     =   11.25    SY =   3.75    RY =   1.46    ZY =   5.68
     QS     =    1.00
     QA     =    0.91
     WEIGHT =   17.97 #/FT

     FORCES
     ACTUAL P =     1.00 K        ALLOWABLE P =    77.71 K
           MX =   549.00 "-K                MX =   584.84 "-K
            V =     9.90 K                 V =    17.79 K
     COMBINED STRESS RATIO =  0.894
     SHEAR    STRESS RATIO =  0.557
```

# Beam Analysis

| | | | |
|---|---|---|---|
| Job #: | | | |
| Page: | | of | |
| Date: | 2/5/2009 | | |
| Designer: | | Ctr: | |

References: none

Author: Arlo Hulick | Rev. 5 | 3/25/2004

**Description:**
Mz Bm #5

| **Support Points** | | |
|---|---|---|
| beam length | 18 | ft |
| first support | 0 | ft. |
| second support | 18 | ft. |

Note: The beam may be cantilevered at either end.

Do not add self weight to uniform load

| **Uniform loads:** | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| starting value | 300 | plf | 1070 | plf | | plf |
| ending value | 300 | plf | 1070 | plf | | plf |
| starting: x = | 0 | ft | 11.3 | ft | | ft |
| ending: x = | 11.3 | ft | 18 | ft | | ft |

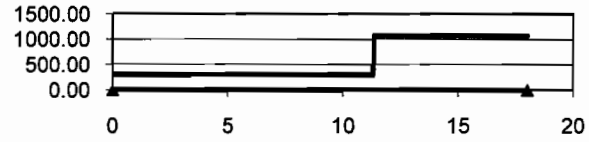
| **Point loads:** | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| magnitude | 18.8 | k | | k | | k |
| location | 11.3 | ft | | ft | | ft |

| **Moment Loads** | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| magnitude | | k" | | k" | | k" |
| location | | ft | | ft | | ft |

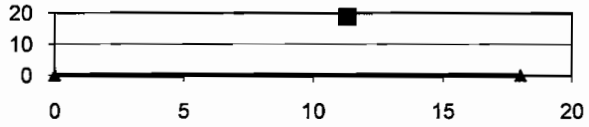
| **Output** | **value** | | **location** | |
|---|---|---|---|---|
| reaction 1 | 10.66 | kips | 0.00 | ft. |
| reaction 2 | 18.70 | kips | 18.00 | ft. |
| max. moment | 1214.0 | k-in. | 11.22 | ft. |
| neg. moment | -0.04 | k-in. | 17.94 | ft. |
| max stress | 26.99 | ksi | 11.22 | ft. |
| max. shear | 18.59 | kips | 17.94 | ft. |
| max. deflection | 0.535 | in. | 9.54 | ft. |
| Deflection Ratio | L / 404 | | | |

| **For beam design:** | | |
|---|---|---|
| 3-plate depth at max stress | 14 | in. |
| shear at max stress | 7.30311 | k |
| 3-plate depth at max shear | 0 | in. |
| Max allowable stress | | ksi |
| overstressed segment start | | ft. |
| overstressed segment end | | ft. |

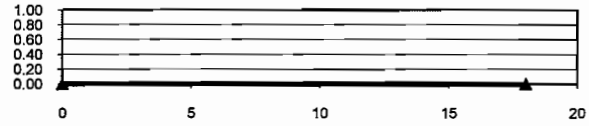
**Unif. load plus self wt**



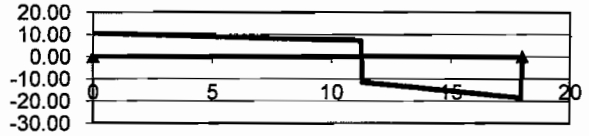

**Point Loads**



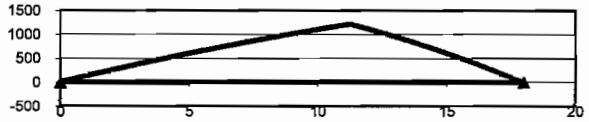

**Moment Loads**



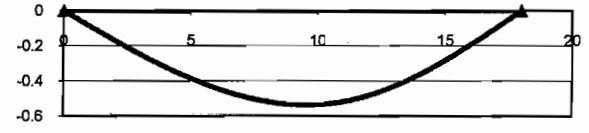

**Shear**




**Moment**




**Deflection**



Mz Bm #5

```
 Design Data:
     AXIAL      =    -1.00 K
     SHEAR      =    18.60 K
     X MOMENT   = 1214.00 "-K
     KLX        =    18.00 FT
     KLY        =    11.30 FT
     LB         =    11.30 FT
     RT         =     0.00
     CB         =     1.00
     CMX        =     1.00
     FLANGE FY  =    55.00 KSI
     WEB FY     =    55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.3750 X  8.0 FLG    0.1875 WEB    14.00 DEPTH
     AREA   =    8.48
     IX     =  314.88     SX =  44.98     RX =   6.09     ZX =  49.10
     IY     =   32.01     SY =   8.00     RY =   1.94     ZY =  12.12
     QS     =    0.98
     QA     =    0.89
     WEIGHT =   28.87 #/FT

     FORCES
     ACTUAL P =     1.00 K          ALLOWABLE P =   222.61 K
           MX =  1214.00 "-K                MX =  1498.59 "-K
            V =    18.60 K                 V =    41.43 K
     COMBINED STRESS RATIO =  0.812
     SHEAR    STRESS RATIO =  0.449
```

# Beam Analysis

| | | | |
|---|---|---|---|
| Job #: | | | |
| Page: | | of | |
| Date: | 2/5/2009 | | |
| Designer: | | Ctr: | |

References: none

Author: Arlo Hulick | Rev. 5 | 3/25/2004

**Description:**
Mz Bm #6

| **Support Points** | | |
|---|---|---|
| beam length | 23.5 | ft |
| first support | 0 | ft. |
| second support | 23.5 | ft. |

Note: The beam may be cantilevered at either end.

Do not add self weight to uniform load

| **Uniform loads:** | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| starting value | 2740 | plf | 2240 | plf | | plf |
| ending value | 2740 | plf | 2240 | plf | | plf |
| starting: x = | 0 | ft | 11.3 | ft | | ft |
| ending: x = | 11.3 | ft | 23.5 | ft | | ft |

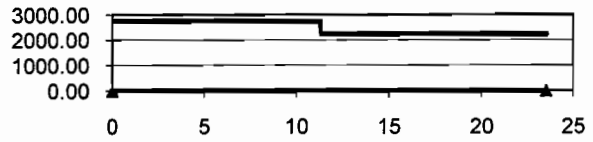
| **Point loads:** | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| magnitude | 10.7 | k | | k | | k |
| location | 11.3 | ft | | ft | | ft |

| **Moment Loads** | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| magnitude | | k" | | k" | | k" |
| location | | ft | | ft | | ft |

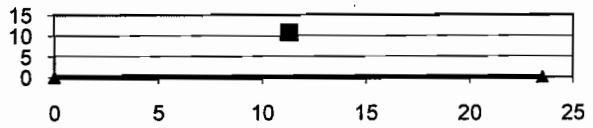
| **Output** | **value** | | **location** | |
|---|---|---|---|---|
| reaction 1 | 36.17 | kips | 0.00 | ft. |
| reaction 2 | 32.82 | kips | 23.50 | ft. |
| max. moment | 2800.0 | k-in. | 11.20 | ft. |
| neg. moment | -0.35 | k-in. | 23.50 | ft. |
| max stress | 35.24 | ksi | 11.20 | ft. |
| max. shear | 36.17 | kips | 0.00 | ft. |
| max. deflection | 1.057 | in. | 11.59 | ft. |
| Deflection Ratio | L / 267 | | | |

| **For beam design:** | | |
|---|---|---|
| 3-plate depth at max stress | 18 | in. |
| shear at max stress | 5.57589 | k |
| 3-plate depth at max shear | 0 | in. |
| Max allowable stress | | ksi |
| overstressed segment start | | ft. |
| overstressed segment end | | ft. |

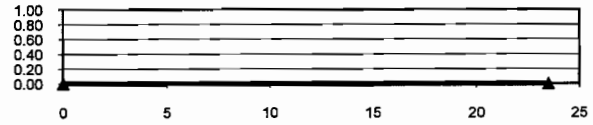
**Unif. load plus self wt**



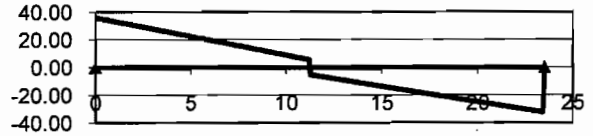

**Point Loads**



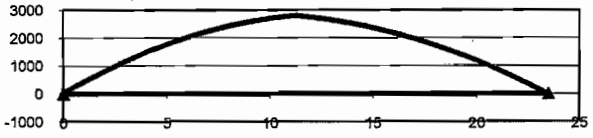

**Moment Loads**



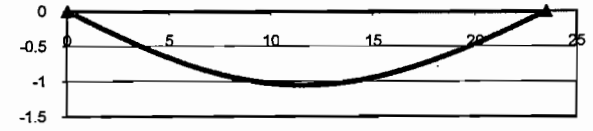

**Shear**




**Moment**




**Deflection**



Mz Bm #6

```
 Design Data:
     AXIAL      =   -1.00 K
     SHEAR      =   36.20 K
     X MOMENT   = 2800.00 "-K
     KLX        =   23.50 FT
     KLY        =    5.00 FT
     LB         =    5.00 FT
     RT         =    0.00
     CB         =    1.00
     CMX        =    1.00
     FLANGE FY  =   55.00 KSI
     WEB FY     =   55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.5000 X  8.0 FLG   0.2500 WEB   18.00 DEPTH
     AREA   =   12.25
     IX     =  715.02    SX =  79.45    RX =   7.64    ZX =  88.06
     IY     =   42.69    SY =  10.67    RY =   1.87    ZY =  16.27
     QS     =    1.00
     QA     =    0.88
     WEIGHT =   41.68 #/FT

     FORCES
     ACTUAL P =     1.00 K        ALLOWABLE P =   321.41 K
           MX =  2800.00 "-K                MX =  2906.06 "-K
            V =    36.20 K                 V =    74.01 K
     COMBINED STRESS RATIO =  0.965
     SHEAR    STRESS RATIO =  0.489
```

# Beam Analysis

| | | | |
|---|---|---|---|
| Job #: | | | |
| Page: | | of | |
| References: none | Date: | 2/5/2009 | |
| Author: Arlo Hulick / Rev. 5 / 3/25/2004 | Designer: | Ctr: | |

**Description:**
Mz Bm #7

| Support Points | | |
|---|---|---|
| beam length | 23.5 | ft |
| first support | 0 | ft. |
| second support | 23.5 | ft. |

Note: The beam may be cantilevered at either end.

Do not add self weight to uniform load

| Uniform loads: | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| starting value | 1610 | plf | 2120 | plf | | plf |
| ending value | 1610 | plf | 2120 | plf | | plf |
| starting: x = | 0 | ft | 11.3 | ft | | ft |
| ending: x = | 11.3 | ft | 23.5 | ft | | ft |

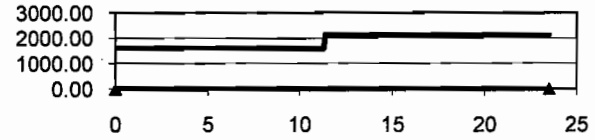
| Point loads: | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| magnitude | 9.9 | k | | k | | k |
| location | 11.3 | ft | | ft | | ft |

| Moment Loads | #1 | | #2 | | #3 | |
|---|---|---|---|---|---|---|
| magnitude | | k" | | k" | | k" |
| location | | ft | | ft | | ft |

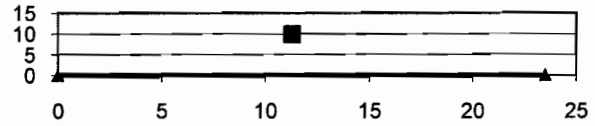
| Output | value | | location | |
|---|---|---|---|---|
| reaction 1 | 25.67 | kips | 0.00 | ft. |
| reaction 2 | 28.28 | kips | 23.50 | ft. |
| max. moment | 2239.6 | k-in. | 11.20 | ft. |
| neg. moment | -0.28 | k-in. | 23.42 | ft. |
| max stress | 24.33 | ksi | 11.20 | ft. |
| max. shear | 27.96 | kips | 23.42 | ft. |
| max. deflection | 0.727 | in. | 11.75 | ft. |
| Deflection Ratio | L / 388 | | | |

| For beam design: | | |
|---|---|---|
| 3-plate depth at max stress | 18 | in. |
| shear at max stress | 7.69738 | k |
| 3-plate depth at max shear | 0 | in. |
| Max allowable stress | | ksi |
| overstressed segment start | | ft. |
| overstressed segment end | | ft. |

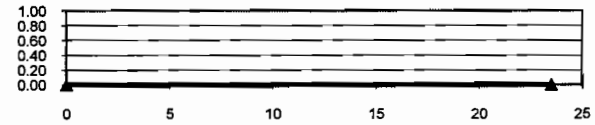
**Unif. load plus self wt**



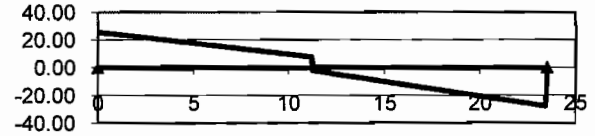

**Point Loads**



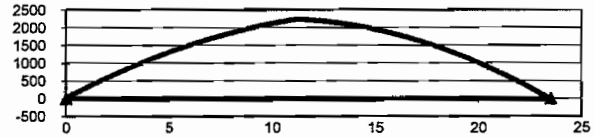

**Moment Loads**



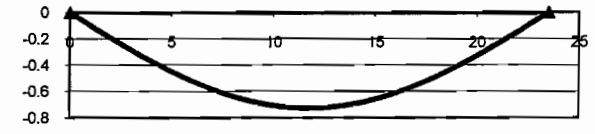

**Shear**




**Moment**




**Deflection**

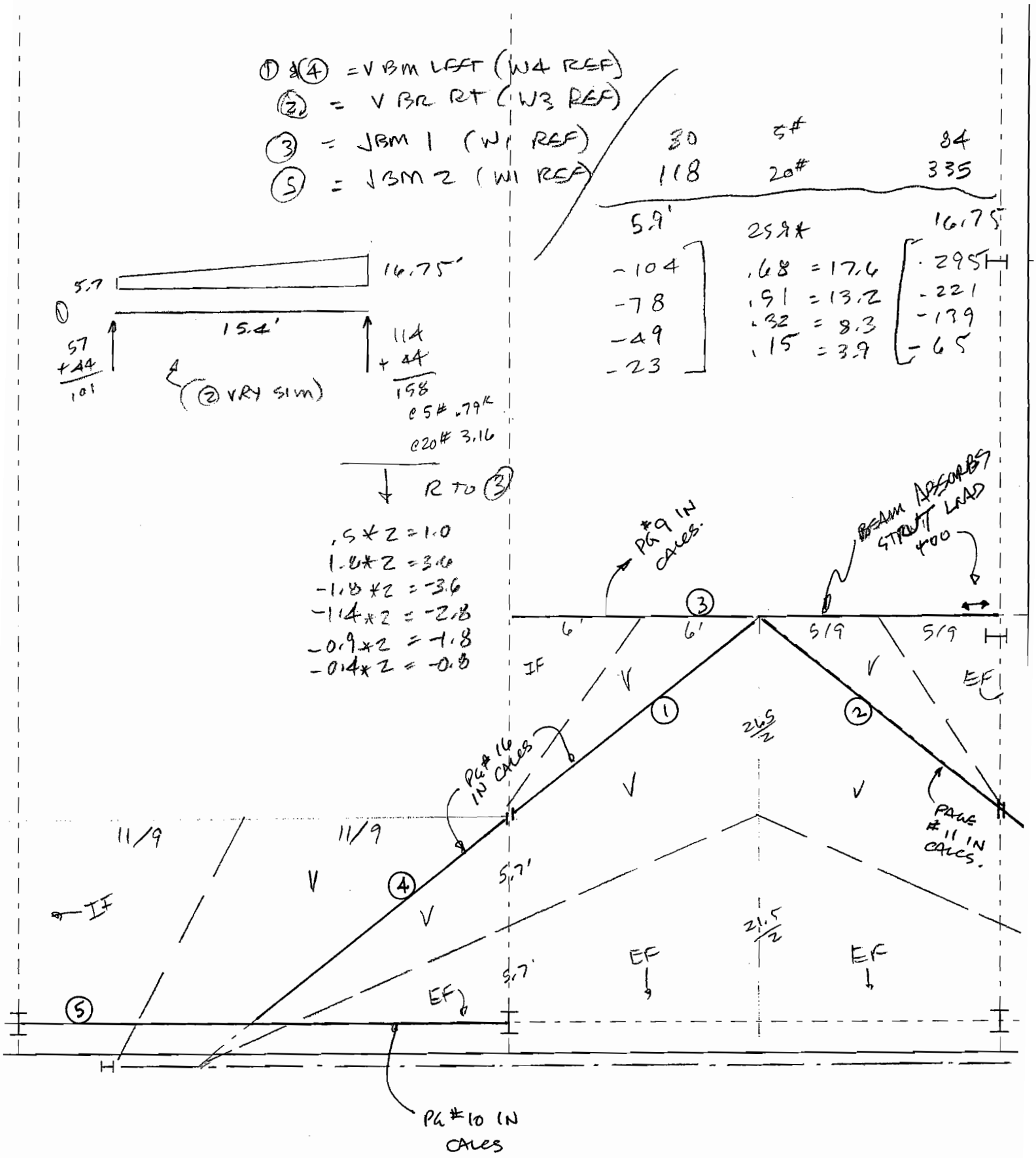


Mz Bm #7

```
 Design Data:
     AXIAL      =   -1.00 K
     SHEAR      =   28.20 K
     X MOMENT   = 2240.00 "-K
     KLX        =   23.50 FT
     KLY        =   12.20 FT
     LB         =   12.20 FT
     RT         =    0.00
     CB         =    1.00
     CMX        =    1.00
     FLANGE FY  =   55.00 KSI
     WEB FY     =   55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.6250 X  8.0 FLG   0.1875 WEB   18.00 DEPTH
     AREA    =  13.14
     IX      =  828.48    SX =  92.05    RX =   7.94    ZX = 100.03
     IY      =   53.34    SY =  13.34    RY =   2.01    ZY =  20.15
     QS      =    1.00
     QA      =    0.90
     WEIGHT =   44.71 #/FT

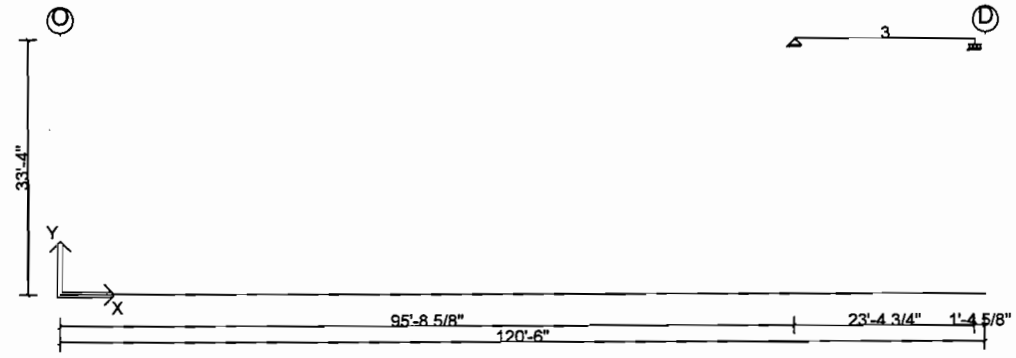
     FORCES
     ACTUAL P =     1.00 K        ALLOWABLE P =   265.58 K
           MX =  2240.00 "-K                MX =  2190.53 "-K
            V =    28.20 K                 V =    33.33 K
     COMBINED STRESS RATIO =  1.024
     SHEAR    STRESS RATIO =  0.846
```




VALLEY LOADS & EP2 PORTION

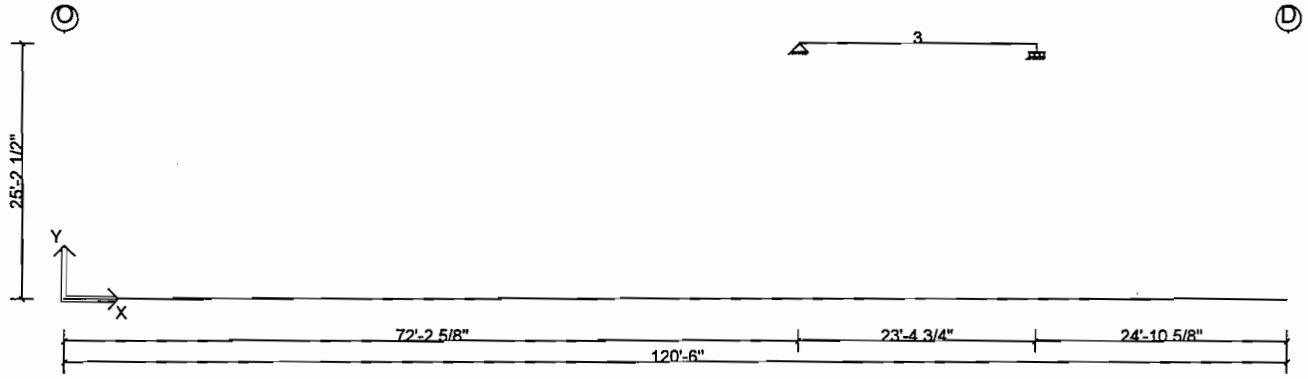
**User Defined Frame Point Loads for Cross Section: 4**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | p | D | support point TLK | -1.00 | 107/7/0 | NA | NA | Y | DOWN | 1.000 | OF |
| 3 | k | CG | | -1.00 | 107/8/1 | NA | NA | N | DOWN | 1.000 | OF |
| 3 | k | L | | -3.60 | 107/8/1 | NA | NA | N | DOWN | 1.000 | OF |
| 3 | k | W1> | TO CORRECT SYSTEM | 3.60 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |
| 3 | k | <W1 | APPLIED LOADING | 2.80 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |
| 3 | k | W2> | | 1.80 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |
| 3 | k | <W2 | | 0.80 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |



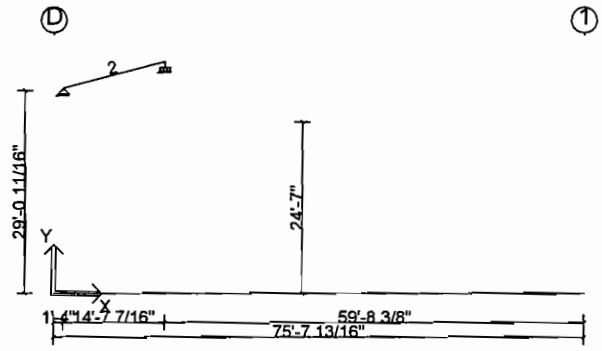
**User Defined Frame Point Loads for Cross Section: 7**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | p | D | support point TLK | -1.00 | 90/11/10 | NA | NA | Y | DOWN | 1.000 | OF |



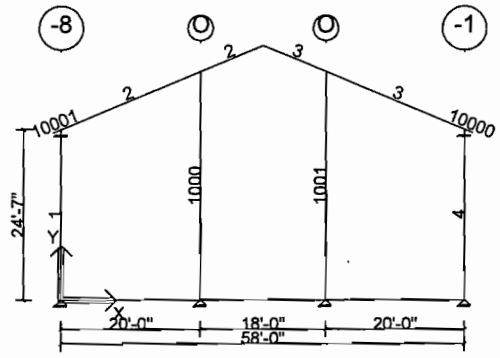
**User Defined Frame Line Loads for Cross Section: 6**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | CG | TO CORRECT SYSTEM APPLIED LOADING | -84.00 | 13/8/10 | -30.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | L | | -335.00 | 13/8/10 | -118.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | | 295.00 | 13/8/10 | 104.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W1 | | 221.00 | 13/8/10 | 78.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | W2> | | 139.00 | 13/8/10 | 49.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W2 | | 65.00 | 13/8/10 | 23.00 | 28/9/15 | N | UP | 1.000 | OF |



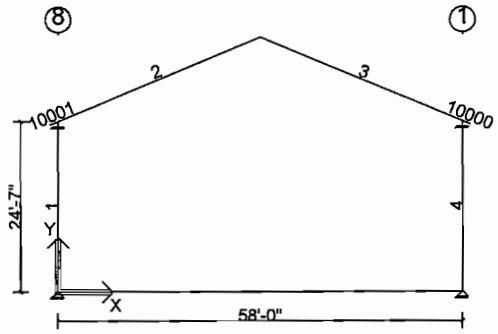
**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -7.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -7.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1000 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | FD | Mezz | -11.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1000 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1001 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | FD | Mezz | -11.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1001 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |



**User Defined Frame Point Loads for Cross Section: M**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |

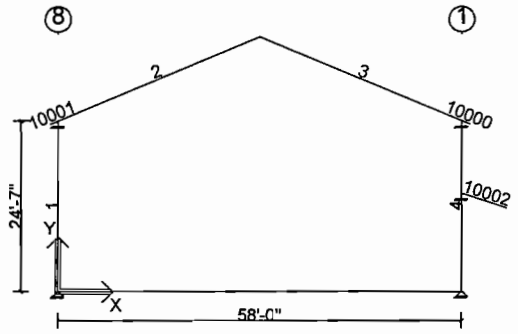


**User Defined Frame Point Loads for Cross Section: L**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 3 | k | CG | Folding Partition (open)->Resolved From Plane | -2.60 | 24/0/0 | NA | NA | N | DOWN | 1.000 | OF |
| 4 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |

**User Defined Frame Line Loads for Cross Section: L**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | plf | CG | Folding Partition->Resolved From Plane | -104.06 | 2/0/0 | -104.06 | 27/0/0 | N | DOWN | 1.000 | OF |

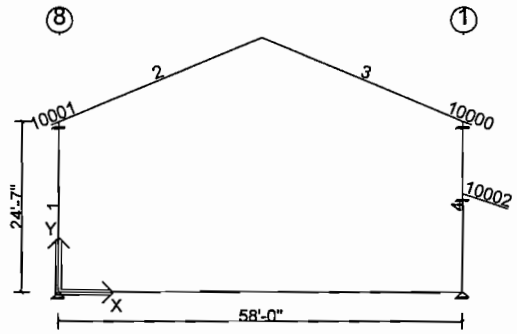


**User Defined Frame Point Loads for Cross Section: K**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 3 | k | CG | Folding Partition (open)->Resolved From Plane | -0.40 | 24/0/0 | NA | NA | N | DOWN | 1.000 | OF |
| 4 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |

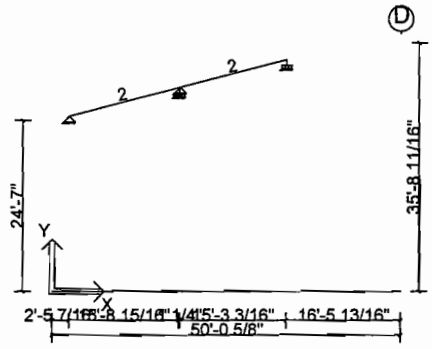
**User Defined Frame Line Loads for Cross Section: K**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | plf | CG | Folding Partition->Resolved From Plane | -15.94 | 2/0/0 | -15.94 | 27/0/0 | N | DOWN | 1.000 | OF |



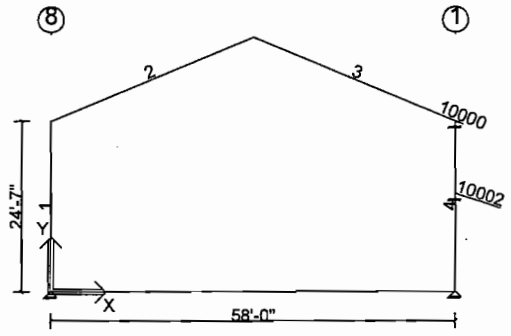
**User Defined Frame Line Loads for Cross Section: 8**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | CG | TO CORRECT SYSTEM APPLIED LOADING | -84.00 | 13/8/10 | -30.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | L | | -335.00 | 13/8/10 | -118.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | | 295.00 | 13/8/10 | 104.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W1 | | 221.00 | 13/8/10 | 78.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | W2> | | 139.00 | 13/8/10 | 49.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W2 | | 65.00 | 13/8/10 | 23.00 | 28/9/15 | N | UP | 1.000 | OF |



**User Defined Frame Point Loads for Cross Section: H**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |




**Influence Areas for Cross Section:**

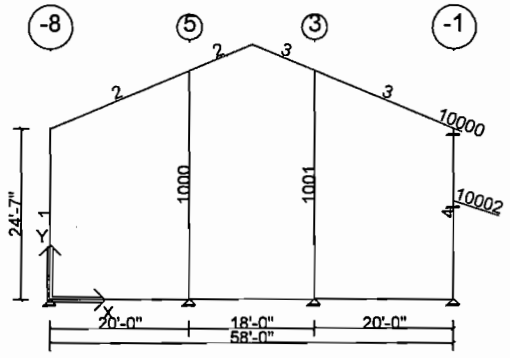
| Location | Distance | Left | Right | Total | Surface | Direction | Override | Area (sq. ft.) |
|---|---|---|---|---|---|---|---|---|
| 118/11/0 - Side 1 | 0/0/0 | 23/6/0 | 0/0/0 | 23/6/0 | Wall 4 (Operations Building) | Leeward | | 485.88 |
| | 24/7/0 | 23/6/0 | 0/0/0 | 23/6/0 | | | | |
| 118/11/0 - Side 1 | 0/0/0 | 0/0/0 | 28/10/0 | 28/10/0 | Wall 3 (Operations Building Lean-to) | Leeward | | 485.88 |
| | 13/8/0 | 0/0/0 | 28/10/0 | 28/10/0 | | | | |

**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -7.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -8.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 1000 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | FD | Mezz | -11.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1000 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1001 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | FD | Mezz | -12.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1001 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | plf | W1> | WIND FROM LEAN-TO SYSTEM OMITTED. | -146.57 | 13/8/0 | -0.00 | 22/10/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W1 | | 177.35 | 13/8/0 | 0.00 | 22/10/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | W2> | | -252.10 | 13/8/0 | -0.00 | 22/10/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W2 | | 71.82 | 13/8/0 | 0.00 | 22/10/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | WP | | 227.18 | 13/8/0 | 0.00 | 22/10/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | W1> | | -146.57 | 0/0/2 | -146.57 | 13/8/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W1 | | 177.35 | 0/0/2 | 177.35 | 13/8/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | W2> | | -252.10 | 0/0/2 | -252.10 | 13/8/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W2 | | 71.82 | 0/0/2 | 71.82 | 13/8/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | WP | | 227.18 | 0/0/2 | 227.18 | 13/8/0 | N | RIGHT | 1.000 | OF |



## Shape: Operations Building Lean-to

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |

| | | | | |
|---|---|---|---|---|
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 31 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 39 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 43 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 50 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 5) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 5) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 20 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 21 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 23 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |
| 4 | System | 1.000 | 0.700 E> | E> |
| 5 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations - Roof - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 L | D + L |
| 2 | System | 1.000 | 1.0 D + 1.0 S | D + S |
| 3 | System | 1.000 | 1.0 D + 1.0 S + 1.0 SD | D + S + SD |
| 4 | System | 1.000 | 1.0 D + 1.0 W1> | D + W1> |
| 5 | System | 1.000 | 1.0 D + 1.0 <W2 | D + <W2 |
| 6 | System | 1.000 | 0.600 D + 1.0 W1> | D + W1> |
| 7 | System | 1.000 | 0.600 D + 1.0 <W2 | D + <W2 |

**Design Load Combinations - Wall - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 5 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 6 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 7 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 8 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 9 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 13 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 14 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 15 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 16 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 17 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 18 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 22 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 23 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 24 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 S + 1.0 SD | S + SD |
| 6 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 0.500 <E | <E |

**Deflection Load Combinations - Roof - Panel**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 1.0 S | S |
| 2 | System | 1.000 | 150 | 150 | 1.0 S + 1.0 SD | S + SD |

## Reactions - Summary Report

### Shape: Operations Building

Builder Contact: Mr. Roy Mouledous
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State Zip: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State Zip: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Load Type Descriptions**

| | | | |
|---|---|---|---|
| D | Material Dead Weight | C | Collateral Load |
| CG | Collateral Load for Gravity Cases | CU | Collateral Load for Wind Cases |
| L | Live Load | ASL^ | Alternate Span Live Load, Shifted Right |
| ^ASL | Alternate Span Live Load, Shifted Left | PL2 | Partial Live, Full, 2 Spans |
| L> | Live - Notional Right | <L | Live - Notional Left |
| S | Snow Load | US1* | Unbalanced Snow Load 1, Shifted Right |
| *US1 | Unbalanced Snow Load 1, Shifted Left | US2* | Unbalanced Snow Load 2, Shifted Right |
| *US2 | Unbalanced Snow Load 2, Shifted Left | SD | Snow Drift Load |
| SS | Sliding Snow Load | RS | Rain Surcharge Load |
| PF1 | Partial Load, Full, 1 Span | PH1 | Partial Load, Half, 1 Span |
| PF2 | Partial Load, Full, 2 Spans | PH2 | Partial Load, Half, 2 Spans |
| S> | Snow - Notional Right | <S | Snow - Notional Left |
| MRS | Minimum Roof Snow | MRS> | Minimum Roof Snow - Notional Right |
| <MRS | Minimum Roof Snow - Notional Left | W | Wind Load |
| W1> | Wind Load, Case 1, Right | <W1 | Wind Load, Case 1, Left |
| W2> | Wind Load, Case 2, Right | <W2 | Wind Load, Case 2, Left |
| W3> | Wind Load, Case 3, Right | <W3 | Wind Load, Case 3, Left |
| W4> | Wind Load, Case 4, Right | <W4 | Wind Load, Case 4, Left |
| W5> | Wind Load, Case 5, Right | <W5 | Wind Load, Case 5, Left |
| W6> | Wind Load, Case 6, Right | <W6 | Wind Load, Case 6, Left |
| WP | Wind Load, Parallel to Ridge | WPR | Wind Load, \|\| Ridge, Right |
| WPL | Wind Load, \|\| Ridge, Left | WPA1 | Wind Parallel - Ref A, Case 1 |
| WPA2 | Wind Parallel - Ref A, Case 2 | WPB1 | Wind Parallel - Ref B, Case 1 |
| WPB2 | Wind Parallel - Ref B, Case 2 | WPC1 | Wind Parallel - Ref C, Case 1 |

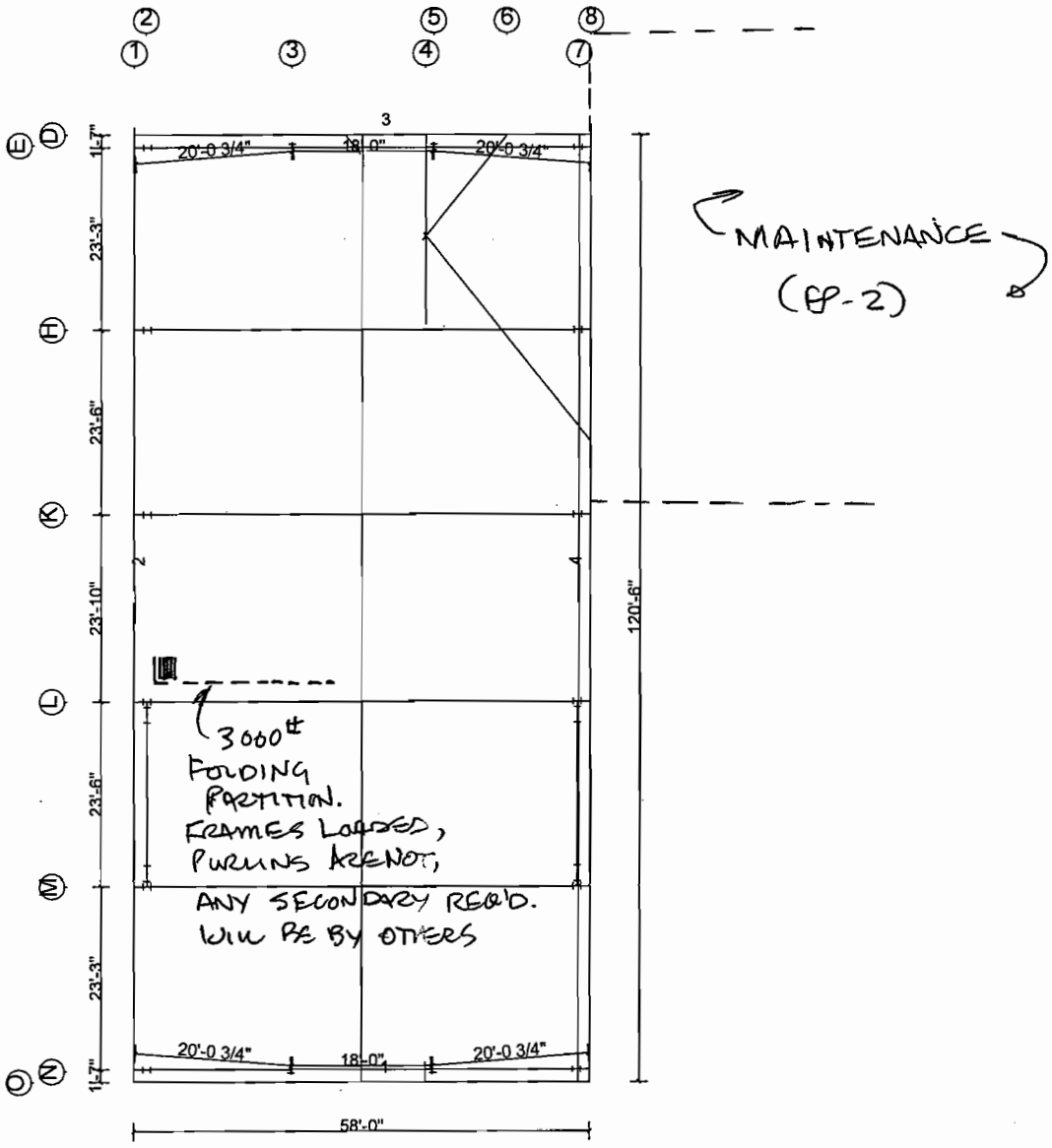
| | |
|---|---|
| WPC2 | Wind Parallel - Ref C, Case 2 |
| WPD2 | Wind Parallel - Ref D, Case 2 |
| <WB1 | Wind Brace Reaction, Case 1, Left |
| <WB2 | Wind Brace Reaction, Case 2, Left |
| <WB3 | Wind Brace Reaction, Case 3, Left |
| <WB4 | Wind Brace Reaction, Case 4, Left |
| <WB5 | Wind Brace Reaction, Case 5, Left |
| <WB6 | Wind Brace Reaction, Case 6, Left |
| MWB | Minimum Wind Bracing Reaction |
| E> | Seismic Load, Right |
| EG | Vertical Seismic Effect |
| EG- | Vertical Seismic Effect, Subtractive |
| <EB | Seismic Brace Reaction, Left |
| FL* | Alternate Span Floor Live Load, Shifted Right |
| FD | Floor Dead Load |
| AL*> | Auxiliary Live Load, Right, Right |
| <AL* | Auxiliary Live Load, Left, Right |
| AL* | Aux Live, Right |
| AL*>(1) | Auxiliary Live Load, Right, Right, Aisle 1 |
| <AL*(1) | Auxiliary Live Load, Left, Right, Aisle 1 |
| AL*(1) | Aux Live, Right, Aisle 1 |
| AL*>(2) | Auxiliary Live Load, Right, Right, Aisle 2 |
| <AL*(2) | Auxiliary Live Load, Left, Right, Aisle 2 |
| AL*(2) | Aux Live, Right, Aisle 2 |
| AL*>(3) | Auxiliary Live Load, Right, Right, Aisle 3 |
| <AL*(3) | Auxiliary Live Load, Left, Right, Aisle 3 |
| AL*(3) | Aux Live, Right, Aisle 3 |
| AL*>(4) | Auxiliary Live Load, Right, Right, Aisle 4 |
| <AL*(4) | Auxiliary Live Load, Left, Right, Aisle 4 |
| AL*(4) | Aux Live, Right, Aisle 4 |
| AL*>(5) | Auxiliary Live Load, Right, Right, Aisle 5 |
| <AL*(5) | Auxiliary Live Load, Left, Right, Aisle 5 |
| AL*(5) | Aux Live, Right, Aisle 5 |
| ALB | Aux Live Bracing Reaction |
| <ALB | Aux Live Bracing Reaction, Left |
| <WALB | Wind, Aux Live Bracing Reaction, Left |
| <ALB(1) | Aux Live Bracing Reaction, Left, Aisle 1 |
| <WALB(1) | Wind, Aux Live Bracing Reaction, Left, Aisle 1 |
| <ALB(2) | Aux Live Bracing Reaction, Left, Aisle 2 |
| <WALB(2) | Wind, Aux Live Bracing Reaction, Left, Aisle 2 |
| <ALB(3) | Aux Live Bracing Reaction, Left, Aisle 3 |
| <WALB(3) | Wind, Aux Live Bracing Reaction, Left, Aisle 3 |
| <ALB(4) | Aux Live Bracing Reaction, Left, Aisle 4 |
| <WALB(4) | Wind, Aux Live Bracing Reaction, Left, Aisle 4 |
| <ALB(5) | Aux Live Bracing Reaction, Left, Aisle 5 |
| <WALB(5) | Wind, Aux Live Bracing Reaction, Left, Aisle 5 |
| AD | Auxiliary Dead Load |
| U1 | User Defined Load - 1 |
| U3 | User Defined Load - 3 |
| U5 | User Defined Load - 5 |
| U7 | User Defined Load - 7 |
| U9 | User Defined Load - 9 |
| UB1 | User Brace Reaction - 1 |
| UB3 | User Brace Reaction - 3 |
| UB5 | User Brace Reaction - 5 |
| UB7 | User Brace Reaction - 7 |
| UB9 | User Brace Reaction - 9 |
| T | Temperature Load |
| WPD1 | Wind Parallel - Ref D, Case 1 |
| WB1> | Wind Brace Reaction, Case 1, Right |
| WB2> | Wind Brace Reaction, Case 2, Right |
| WB3> | Wind Brace Reaction, Case 3, Right |
| WB4> | Wind Brace Reaction, Case 4, Right |
| WB5> | Wind Brace Reaction, Case 5, Right |
| WB6> | Wind Brace Reaction, Case 6, Right |
| MW | Minimum Wind Load |
| E | Seismic Load |
| <E | Seismic Load, Left |
| EG+ | Vertical Seismic Effect, Additive |
| EB> | Seismic Brace Reaction, Right |
| FL | Floor Live Load |
| *FL | Alternate Span Floor Live Load, Shifted Left |
| AL | Auxiliary Live Load |
| *AL> | Auxiliary Live Load, Right, Left |
| <*AL | Auxiliary Live Load, Left, Left |
| *AL | Aux Live, Left |
| *AL>(1) | Auxiliary Live Load, Right, Left, Aisle 1 |
| <*AL(1) | Auxiliary Live Load, Left, Left, Aisle 1 |
| *AL(1) | Aux Live, Left, Aisle 1 |
| *AL>(2) | Auxiliary Live Load, Right, Left, Aisle 2 |
| <*AL(2) | Auxiliary Live Load, Left, Left, Aisle 2 |
| *AL(2) | Aux Live, Left, Aisle 2 |
| *AL>(3) | Auxiliary Live Load, Right, Left, Aisle 3 |
| <*AL(3) | Auxiliary Live Load, Left, Left, Aisle 3 |
| *AL(3) | Aux Live, Left, Aisle 3 |
| *AL>(4) | Auxiliary Live Load, Right, Left, Aisle 4 |
| <*AL(4) | Auxiliary Live Load, Left, Left, Aisle 4 |
| *AL(4) | Aux Live, Left, Aisle 4 |
| *AL>(5) | Auxiliary Live Load, Right, Left, Aisle 5 |
| <*AL(5) | Auxiliary Live Load, Left, Left, Aisle 5 |
| *AL(5) | Aux Live, Left, Aisle 5 |
| ALB> | Aux Live Bracing Reaction, Right |
| WALB> | Wind, Aux Live Bracing Reaction, Right |
| ALB>(1) | Aux Live Bracing Reaction, Right, Aisle 1 |
| WALB>(1) | Wind, Aux Live Bracing Reaction, Right, Aisle 1 |
| ALB>(2) | Aux Live Bracing Reaction, Right, Aisle 2 |
| WALB>(2) | Wind, Aux Live Bracing Reaction, Right, Aisle 2 |
| ALB>(3) | Aux Live Bracing Reaction, Right, Aisle 3 |
| WALB>(3) | Wind, Aux Live Bracing Reaction, Right, Aisle 3 |
| ALB>(4) | Aux Live Bracing Reaction, Right, Aisle 4 |
| WALB>(4) | Wind, Aux Live Bracing Reaction, Right, Aisle 4 |
| ALB>(5) | Aux Live Bracing Reaction, Right, Aisle 5 |
| WALB>(5) | Wind, Aux Live Bracing Reaction, Right, Aisle 5 |
| WALB | Wind, Aux Live Bracing Reaction |
| U0 | User Defined Load |
| U2 | User Defined Load - 2 |
| U4 | User Defined Load - 4 |
| U6 | User Defined Load - 6 |
| U8 | User Defined Load - 8 |
| UB | User Brace Reaction |
| UB2 | User Brace Reaction - 2 |
| UB4 | User Brace Reaction - 4 |
| UB6 | User Brace Reaction - 6 |
| UB8 | User Brace Reaction - 8 |
| R | Rain Load |
| V | Shear |

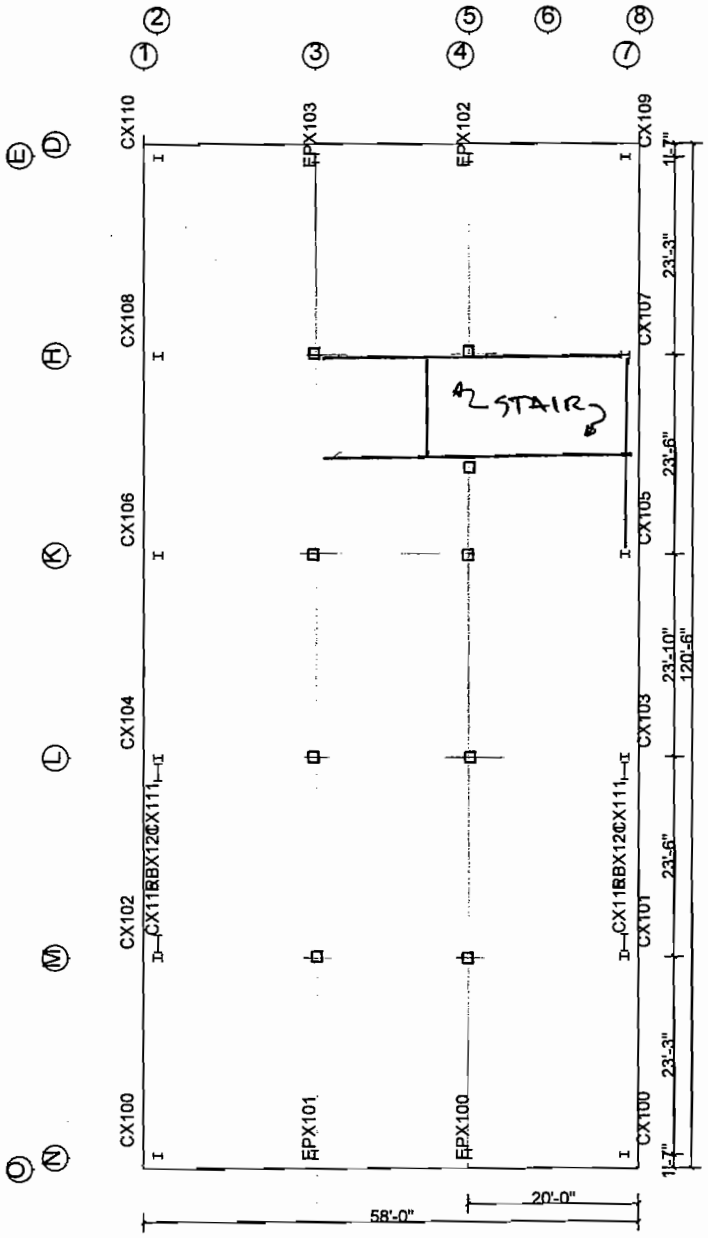
**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Operations Building | 58/0/0 | 120/6/0 | 6989 | 8153 | 8461 | 24/7/0 | 24/7/0 | 5.000:12 | 5.000:12 | 36/8/0 |
| Operations Building Lean-to | 27/6/0 | 58/0/0 | 1595 | 1796 | 1791 | 22/10/0 | 13/8/0 | 4.000:12 | | |
| Total For All Shapes | | | 8584 | 9949 | 10252 | | | | | |

**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | 1- | 1-O | 58/0/0 | 120/6/0 | 24/7/0 | 24/7/0 | 5.000:12 | 5.000:12 | 29/0/0 | 36/8/0 |






- FORM DECK BY VP. PROPERTIES SHOWN ON ERECTION DRAWINGS
- FLOOR LOAD CALCS & DESIGNS FOUND AFTER PG #8, THIS PKG.
- JOIST CALCULATIONS ARE NOT AVAILABLE WITH ORDER IS FINALIZED.

**Wall: 2**

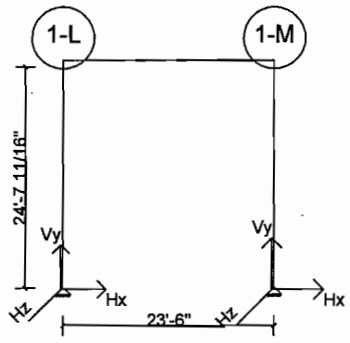
**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |

| | | | | |
|---|---|---|---|---|
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Wall: 2**
Frame ID:Portal Frame

Frame Type:Portal Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 1**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 23/6/0 | | | | |
| Grid1 - Grid2 | | 1-L | | 1-M | | | | |
| Base Plate W x L (in.) | | 11 x 25 | | 11 x 25 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.0 | 1.1 | -0.0 | 1.1 | - | - | - |
| FD | Frm | 0.3 | 6.4 | -0.3 | 6.4 | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.6 | 12.7 | -0.6 | 12.7 | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| E> | Frm | -1.6 | -2.0 | -1.6 | 2.0 | - | - | - |
| EG+ | Frm | - | 0.2 | - | 0.2 | - | - | - |
| <E | Frm | 1.6 | 2.0 | 1.6 | -2.0 | - | - | - |
| EG- | Frm | - | -0.2 | - | -0.2 | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | 4.4 | 10.2 | 4.2 | -10.2 | - | - | - |
| <WB1 | Brc | -4.5 | -11.0 | -4.8 | 11.0 | - | - | - |
| WB2> | Brc | 5.6 | 13.0 | 5.4 | -13.0 | - | - | - |
| <WB2 | Brc | -3.4 | -8.2 | -3.6 | 8.2 | - | - | - |
| EB> | Brc | 2.3 | 3.8 | 2.2 | -3.8 | - | - | - |
| <EB | Brc | -2.2 | -3.8 | -2.3 | 3.8 | - | - | - |

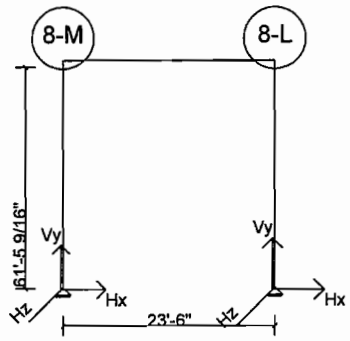
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 1-L | 4.4 | 54 | 5.9 | 59 | - | - | - | - | 6.5 | 54 | 26.7 | 63 | - | - | - | - |
| 23/6/0 | 1-M | 5.1 | 53 | 5.2 | 60 | - | - | - | - | 8.5 | 60 | 25.3 | 57 | - | - | - | - |

**Wall: 4**
Frame ID:Portal Frame

Frame Type:Portal Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 8**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 23/6/0 | | | | |
| Grid1 - Grid2 | | 8-M | | 8-L | | | | |
| Base Plate W x L (in.) | | 11 x 25 | | 11 x 25 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.0 | 1.1 | -0.0 | 1.1 | - | - | - |
| FD | Frm | 0.3 | 6.4 | -0.3 | 6.4 | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.6 | 12.7 | -0.6 | 12.7 | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| E> | Frm | 1.6 | 2.0 | 1.6 | -2.0 | - | - | - |
| EG+ | Frm | - | 0.2 | - | 0.2 | - | - | - |
| <E | Frm | -1.6 | -2.0 | -1.6 | 2.0 | - | - | - |
| EG- | Frm | - | -0.2 | - | -0.2 | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | -4.3 | -10.5 | -4.5 | 10.5 | - | - | - |
| <WB1 | Brc | 4.9 | 11.3 | 4.7 | -11.3 | - | - | - |
| WB2> | Brc | -5.5 | -13.3 | -5.8 | 13.3 | - | - | - |
| <WB2 | Brc | 3.7 | 8.4 | 3.5 | -8.4 | - | - | - |
| EB> | Brc | -2.2 | -3.8 | -2.3 | 3.8 | - | - | - |
| <EB | Brc | 2.3 | 3.8 | 2.2 | -3.8 | - | - | - |

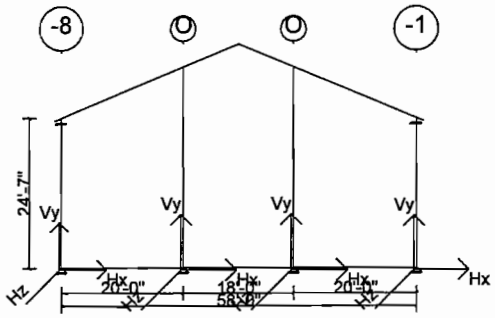
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 8-M | 5.3 | 60 | 5.2 | 53 | - | - | - | - | 8.8 | 60 | 25.5 | 57 | - | - | - | - |
| 23/6/0 | 8-L | 6.1 | 59 | 4.5 | 54 | - | - | - | - | 6.8 | 54 | 27.0 | 63 | - | - | - | - |

**Wall: 4, Frame at: 1/7/0**
Frame ID:CB2 End

Frame Type:Continuous Beam




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Exterior Column | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
| Grid1 - Grid2 | | -8 | | 5-O | | | 3-O | | | -1 | | |
| Base Plate W x L (in.) | | 9 x 13 | | 11 x 13 | | | 11 x 13 | | | 9 x 13 | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |
| D | Frm | 0.1 | 1.6 | - | - | 2.4 | - | - | 2.4 | -0.1 | 1.6 | - |
| FD | Frm | 0.1 | 7.1 | - | 0.2 | 11.8 | - | 0.2 | 11.8 | -0.1 | 7.1 | - |
| CG | Frm | 0.1 | 0.9 | - | - | 1.3 | - | - | 1.3 | -0.1 | 0.9 | - |
| L> | Frm | 0.2 | 3.4 | - | - | 5.3 | - | - | 5.3 | -0.2 | 3.4 | - |
| <L | Frm | 0.2 | 3.4 | - | - | 5.3 | - | - | 5.3 | -0.2 | 3.4 | - |
| S> | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| <S | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| S | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| SD | Frm | - | - | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - | - | - |
| US1* | Frm | - | 0.3 | - | - | 1.1 | - | - | 0.5 | - | 0.1 | - |
| *US1 | Frm | - | 0.1 | - | - | 0.5 | - | - | 1.1 | - | 0.3 | - |
| W1> | Frm | 4.7 | 0.5 | - | 7.4 | -9.7 | - | 7.3 | 2.9 | 4.8 | -7.8 | - |
| <W1 | Frm | -4.8 | -7.8 | - | -6.6 | 2.9 | - | -6.6 | -9.7 | -4.7 | 0.5 | - |
| W2> | Frm | 3.6 | 3.4 | - | - | -9.0 | - | - | 3.6 | 5.8 | -4.9 | - |
| <W2 | Frm | -5.8 | -4.9 | - | - | 3.6 | - | - | -9.0 | -3.6 | 3.4 | - |
| WP | Frm | 2.2 | -7.3 | - | - | -2.3 | - | - | -2.3 | -2.2 | -7.3 | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 14.3 | - | 0.4 | 23.7 | - | 0.4 | 23.7 | -0.2 | 14.3 | - |
| L | Frm | 0.2 | 3.4 | - | - | 5.3 | - | - | 5.3 | -0.2 | 3.4 | - |
| E> | Frm | 0.7 | 0.7 | - | 1.9 | -0.9 | - | 1.9 | 0.9 | 0.7 | -0.7 | - |
| EG+ | Frm | - | 0.2 | - | - | 0.4 | - | - | 0.4 | - | 0.2 | - |
| <E | Frm | -0.7 | -0.7 | - | -1.9 | 0.9 | - | -1.9 | -0.9 | -0.7 | 0.7 | - |
| EG- | Frm | - | -0.2 | - | - | -0.4 | - | - | -0.4 | - | -0.2 | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left | Load | Hrz Right | Load | Hrz In | Load | Hrz Out | Load | Uplift | Load | Vrt Down | Load | Mom cw | Load | Mom ccw | Load |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | (-Hx) (k) | Case | (Hx) (k) | Case | (-Hz) (k) | Case | (Hz) (k) | Case | (-Vy) (k) | Case | (Vy) (k) | Case | (-Mzz) (in-k) | Case | (Mzz) (in-k) | Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -8 | 5.7 | 17 | 4.9 | 9 | - | - | - | - | 2.6 | 15 | 25.4 | 36 | - | - | - | - |
| 20/0/0 | 5-O | - | - | - | - | 6.5 | 15 | 7.6 | 9 | 1.2 | 14 | 40.0 | 37 | - | - | - | - |
| 38/0/0 | 3-O | - | - | - | - | 6.5 | 15 | 7.5 | 9 | 1.1 | 15 | 40.0 | 36 | - | - | - | - |
| 58/0/0 | -1 | 4.9 | 10 | 5.7 | 16 | - | - | - | - | 2.6 | 14 | 25.5 | 37 | - | - | - | - |

**Wall: 4, Frame at: 24/10/0**

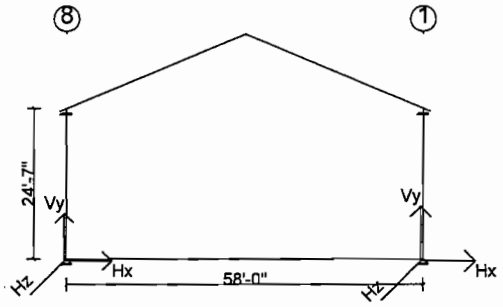
**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |

| | | | | |
|---|---|---|---|---|
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Wall: 4, Frame at: 24/10/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.
**Reactions - Unfactored Load Type at Frame Cross Section: M**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | M-8 | | M-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.8 | 4.8 | -0.8 | 4.9 | - | - | - |
| FD | Frm | 0.1 | 6.4 | -0.1 | 6.4 | - | - | - |
| CG | Frm | 0.8 | 3.5 | -0.8 | 3.5 | - | - | - |
| L> | Frm | 3.1 | 14.1 | -3.1 | 14.1 | - | - | - |
| <L | Frm | 3.1 | 14.1 | -3.1 | 14.1 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 1.6 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 1.6 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 1.6 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | 0.4 | 2.0 | -0.4 | 1.2 | - | - | - |
| *US1 | Frm | 0.4 | 1.2 | -0.4 | 2.0 | - | - | - |
| W1> | Frm | 6.7 | -7.4 | 10.4 | -14.7 | - | - | - |
| <W1 | Frm | -10.4 | -14.7 | -6.7 | -7.4 | - | - | - |
| W2> | Frm | 5.4 | -1.1 | 11.7 | -8.4 | - | - | - |
| <W2 | Frm | -11.7 | -8.4 | -5.4 | -1.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.3 | 12.7 | -0.3 | 12.7 | - | - | - |
| L | Frm | 3.1 | 14.1 | -3.1 | 14.1 | - | - | - |
| E> | Frm | 1.5 | 0.8 | 1.5 | -0.8 | - | - | - |
| EG+ | Frm | 0.0 | 0.3 | -0.0 | 0.3 | - | - | - |
| <E | Frm | -1.5 | -0.8 | -1.5 | 0.8 | - | - | - |
| EG- | Frm | -0.0 | -0.3 | 0.0 | -0.3 | - | - | - |
| WP | Frm | 3.3 | -11.7 | -3.3 | -11.7 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

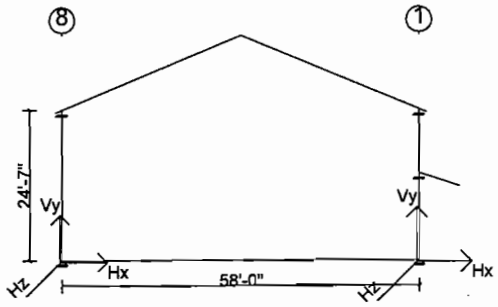
| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | M-8 | 11.2 | 16 | 9.3 | 30 | - | - | - | - | 8.0 | 14 | 34.9 | 27 | - | - | - | - |
| 58/0/0 | M-1 | 9.3 | 31 | 11.2 | 15 | - | - | - | - | 7.9 | 13 | 34.9 | 27 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | M-8 | Portal Frame is next to column. See portal frame section for reactions |
| 58/0/0 | M-1 | Portal Frame is next to column. See portal frame section for reactions |

**Wall: 4, Frame at: 48/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: L**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | L-8 | | L-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.9 | 4.8 | -0.9 | 5.7 | - | - | - |
| FD | Frm | 0.1 | 6.4 | -0.1 | 6.4 | - | - | - |
| CG | Frm | 1.4 | 4.4 | -1.4 | 8.2 | - | - | - |
| L> | Frm | 3.5 | 14.1 | -3.5 | 16.4 | - | - | - |
| <L | Frm | 3.5 | 14.1 | -3.5 | 16.4 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 2.0 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 2.0 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 2.0 | - | - | - |
| SD | Frm | -0.1 | -0.1 | 0.1 | 1.5 | - | - | - |
| SS | Frm | - | - | - | 0.1 | - | - | - |
| US1* | Frm | 0.5 | 2.0 | -0.5 | 1.3 | - | - | - |
| *US1 | Frm | 0.5 | 1.2 | -0.5 | 2.0 | - | - | - |
| W1> | Frm | 6.5 | -7.4 | 9.7 | -18.5 | - | - | - |
| <W1 | Frm | -10.9 | -14.9 | -6.8 | -8.6 | - | - | - |
| W2> | Frm | 5.2 | -1.0 | 10.9 | -12.1 | - | - | - |
| <W2 | Frm | -12.1 | -8.5 | -5.5 | -2.2 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 12.7 | -0.2 | 12.7 | - | - | - |
| L | Frm | 3.5 | 14.1 | -3.5 | 16.4 | - | - | - |
| E> | Frm | 1.6 | 0.9 | 1.7 | -1.0 | - | - | - |
| EG+ | Frm | 0.1 | 0.4 | -0.1 | 0.5 | - | - | - |
| <E | Frm | -1.6 | -0.9 | -1.7 | 1.0 | - | - | - |
| EG- | Frm | -0.1 | -0.4 | 0.1 | -0.5 | - | - | - |
| WP | Frm | 3.5 | -10.9 | -4.1 | -12.7 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | L-8 | 11.5 | 16 | 10.1 | 30 | - | - | - | - | 8.2 | 14 | 35.6 | 27 | - | - | - | - |
| 58/0/0 | L-1 | 10.3 | 31 | 10.4 | 15 | - | - | - | - | 11.2 | 13 | 42.2 | 27 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | L-8 | Portal Frame is next to column. See portal frame section for reactions |
| 58/0/0 | L-1 | Portal Frame is next to column. See portal frame section for reactions |

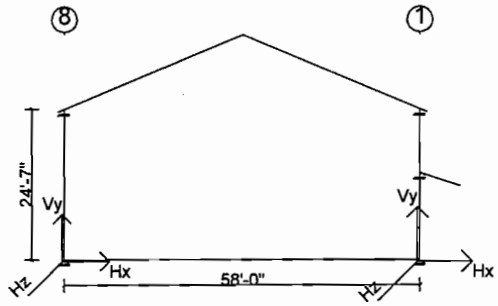
## Wall: 4, Frame at: 72/2/0

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Wall: 4, Frame at: 72/2/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: K**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | K-8 | | K-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.8 | 4.9 | -0.8 | 6.2 | - | - | - |
| FD | Frm | 0.2 | 12.7 | -0.2 | 12.7 | - | - | - |
| CG | Frm | 0.9 | 3.6 | -0.9 | 5.0 | - | - | - |
| L> | Frm | 3.4 | 14.0 | -3.4 | 17.6 | - | - | - |
| <L | Frm | 3.4 | 14.0 | -3.4 | 17.6 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 2.3 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 2.3 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 2.3 | - | - | - |
| SD | Frm | -0.2 | -0.2 | 0.2 | 2.3 | - | - | - |
| SS | Frm | -0.0 | -0.0 | 0.0 | 0.2 | - | - | - |
| US1* | Frm | 0.5 | 2.0 | -0.5 | 1.3 | - | - | - |
| *US1 | Frm | 0.5 | 1.2 | -0.5 | 2.0 | - | - | - |
| W1> | Frm | 6.5 | -7.4 | 9.0 | -20.4 | - | - | - |
| <W1 | Frm | -10.9 | -14.8 | -7.0 | -9.1 | - | - | - |
| W2> | Frm | 5.2 | -1.0 | 10.3 | -14.0 | - | - | - |
| <W2 | Frm | -12.2 | -8.4 | -5.7 | -2.7 | - | - | - |
| WP | Frm | 3.6 | -11.0 | -4.1 | -12.8 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.5 | 25.4 | -0.5 | 25.4 | - | - | - |
| L | Frm | 3.4 | 14.0 | -3.4 | 17.6 | - | - | - |
| E> | Frm | 1.8 | 1.0 | 1.9 | -1.0 | - | - | - |
| EG+ | Frm | 0.0 | 0.5 | -0.0 | 0.6 | - | - | - |
| <E | Frm | -1.8 | -1.0 | -1.9 | 1.0 | - | - | - |
| EG- | Frm | -0.0 | -0.5 | 0.0 | -0.6 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

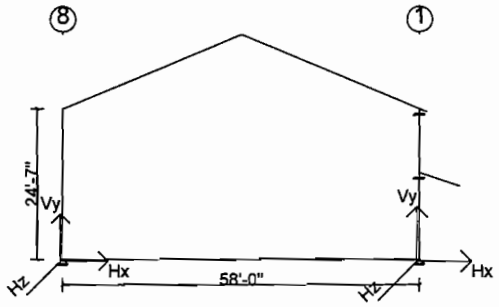
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | K-8 | 11.5 | 17 | 9.8 | 34 | - | - | - | - | 4.3 | 15 | 50.7 | 31 | - | - | - | - |
| 58/0/0 | K-1 | 10.2 | 35 | 9.6 | 16 | - | - | - | - | 9.1 | 14 | 56.1 | 31 | - | - | - | - |

**Wall: 4, Frame at: 95/8/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: H**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | H-8 | | H-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.9 | 5.0 | -0.9 | 6.3 | - | - | - |
| FD | Frm | 0.2 | 12.7 | -0.2 | 12.7 | - | - | - |
| CG | Frm | 1.1 | 4.2 | -1.1 | 4.8 | - | - | - |
| L> | Frm | 4.2 | 16.8 | -4.2 | 18.9 | - | - | - |
| <L | Frm | 4.2 | 16.8 | -4.2 | 18.9 | - | - | - |
| S> | Frm | 0.4 | 1.5 | -0.4 | 2.2 | - | - | - |
| <S | Frm | 0.4 | 1.5 | -0.4 | 2.2 | - | - | - |
| S | Frm | 0.4 | 1.5 | -0.4 | 2.2 | - | - | - |
| SD | Frm | -0.2 | -0.2 | 0.2 | 2.2 | - | - | - |
| SS | Frm | -0.0 | -0.0 | 0.0 | 0.2 | - | - | - |
| US1* | Frm | 0.5 | 1.9 | -0.5 | 1.2 | - | - | - |
| *US1 | Frm | 0.5 | 1.2 | -0.5 | 2.0 | - | - | - |
| W1> | Frm | 5.9 | -9.8 | 9.8 | -21.7 | - | - | - |
| <W1 | Frm | -11.4 | -16.5 | -6.2 | -10.4 | - | - | - |
| W2> | Frm | 4.9 | -1.8 | 10.5 | -14.5 | - | - | - |
| <W2 | Frm | -12.4 | -8.7 | -5.5 | -3.2 | - | - | - |
| WP | Frm | 3.2 | -11.4 | -3.9 | -13.5 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.5 | 25.4 | -0.5 | 25.4 | - | - | - |
| L | Frm | 4.2 | 16.8 | -4.2 | 18.9 | - | - | - |
| E> | Frm | 2.3 | 1.2 | 2.1 | -1.2 | - | - | - |
| EG+ | Frm | 0.0 | 0.5 | -0.0 | 0.6 | - | - | - |
| <E | Frm | -2.3 | -1.2 | -2.1 | 1.2 | - | - | - |
| EG- | Frm | -0.0 | -0.5 | 0.0 | -0.6 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

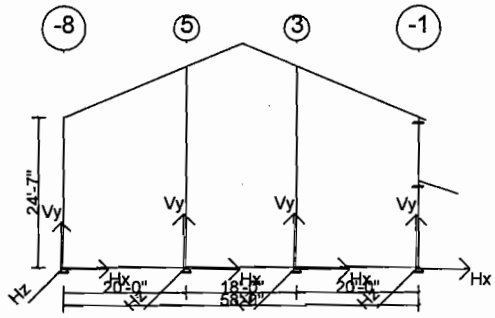
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) | Load Case | Hrz Right (Hx) | Load Case | Hrz In (-Hz) | Load Case | Hrz Out (Hz) | Load Case | Uplift (-Vy) | Load Case | Vrt Down (Vy) | Load Case | Mom cw (-Mzz) | Load Case | Mom ccw (Mzz) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | (k) | | (k) | | (k) | | (k) | | (k) | | (k) | | (in-k) | | (in-k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | H-8 | 11.7 | 17 | 10.1 | 34 | - | - | - | - | 5.9 | 15 | 53.6 | 31 | - | - | - | - |
| 58/0/0 | H-1 | 10.4 | 35 | 9.8 | 16 | - | - | - | - | 10.3 | 14 | 57.0 | 31 | - | - | - | - |

**Wall: 4, Frame at: 118/11/0**
Frame ID:CB2 End

Frame Type:Continuous Beam




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Exterior Column | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
| Grid1 - Grid2 | | -8 | | D-5 | | | D-3 | | | -1 | | |
| Base Plate W x L (in.) | | 9 x 13 | | 11 x 13 | | | 11 x 13 | | | 9 x 13 | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |
| D | Frm | 0.0 | 1.5 | - | -0.0 | 4.1 | - | -0.0 | 3.4 | -0.0 | 2.7 | - |
| FD | Frm | 0.1 | 7.1 | - | 0.2 | 11.8 | - | 0.2 | 12.8 | -0.1 | 8.1 | - |
| CG | Frm | 0.0 | 0.8 | - | -0.0 | 3.7 | - | -0.0 | 2.3 | -0.0 | 1.4 | - |
| L> | Frm | 0.1 | 3.1 | - | -0.1 | 14.8 | - | -0.1 | 9.2 | -0.1 | 5.7 | - |
| <L | Frm | 0.1 | 3.1 | - | -0.1 | 14.8 | - | -0.1 | 9.2 | -0.1 | 5.7 | - |
| S> | Frm | - | 0.3 | - | - | 1.2 | - | - | 1.1 | - | 0.8 | - |
| <S | Frm | - | 0.3 | - | - | 1.2 | - | - | 1.1 | - | 0.8 | - |
| S | Frm | - | 0.3 | - | - | 1.2 | - | - | 1.1 | - | 0.8 | - |
| SD | Frm | -0.1 | -0.2 | - | -0.0 | 3.0 | - | -0.0 | 2.5 | 0.1 | 1.5 | - |
| SS | Frm | - | -0.0 | - | - | 0.0 | - | - | -0.0 | - | 0.1 | - |
| US1* | Frm | - | 0.2 | - | - | 1.1 | - | - | 0.5 | - | 0.1 | - |
| *US1 | Frm | - | 0.0 | - | - | 0.5 | - | - | 1.1 | - | 0.3 | - |
| W1> | Frm | 6.7 | 1.7 | - | 0.9 | -19.0 | - | 0.9 | 0.4 | 6.0 | -12.2 | - |
| <W1 | Frm | -7.1 | -9.1 | - | 0.7 | -0.5 | - | 0.7 | -13.4 | -7.8 | 0.6 | - |
| W2> | Frm | 5.2 | 5.7 | - | -0.2 | -15.8 | - | -0.2 | 2.4 | 8.3 | -9.1 | - |
| <W2 | Frm | -8.5 | -5.1 | - | 0.5 | 2.6 | - | 0.5 | -11.4 | -5.5 | 3.6 | - |
| WP | Frm | 2.9 | -9.0 | - | -1.2 | -1.8 | - | -1.2 | -4.6 | -5.5 | -9.1 | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 14.4 | - | 0.4 | 23.6 | - | 0.4 | 23.6 | -0.2 | 14.4 | - |
| L | Frm | 0.1 | 3.1 | - | -0.1 | 14.8 | - | -0.1 | 9.2 | -0.1 | 5.7 | - |
| E> | Frm | 1.6 | 1.4 | - | 1.8 | -1.8 | - | 1.8 | 2.1 | 1.5 | -1.6 | - |
| EG+ | Frm | - | 0.2 | - | - | 0.5 | - | - | 0.4 | - | 0.3 | - |
| <E | Frm | -1.6 | -1.4 | - | -1.8 | 1.8 | - | -1.8 | -2.1 | -1.5 | 1.6 | - |
| EG- | Frm | - | -0.2 | - | - | -0.5 | - | - | -0.4 | - | -0.3 | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -8 | 8.4 | 17 | 6.8 | 9 | - | - | - | - | 3.9 | 15 | 26.8 | 36 | - | - | - | - |
| 20/0/0 | D-5 | - | - | - | - | 1.1 | 48 | 1.4 | 45 | 9.5 | 14 | 50.3 | 37 | - | - | - | - |
| 38/0/0 | D-3 | - | - | - | - | 1.1 | 48 | 1.4 | 45 | 3.7 | 15 | 44.9 | 36 | - | - | - | - |
| 58/0/0 | -1 | 7.9 | 10 | 8.2 | 16 | - | - | - | - | 5.7 | 14 | 30.0 | 37 | - | - | - | - |

## Shape: Operations Building Lean-to

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

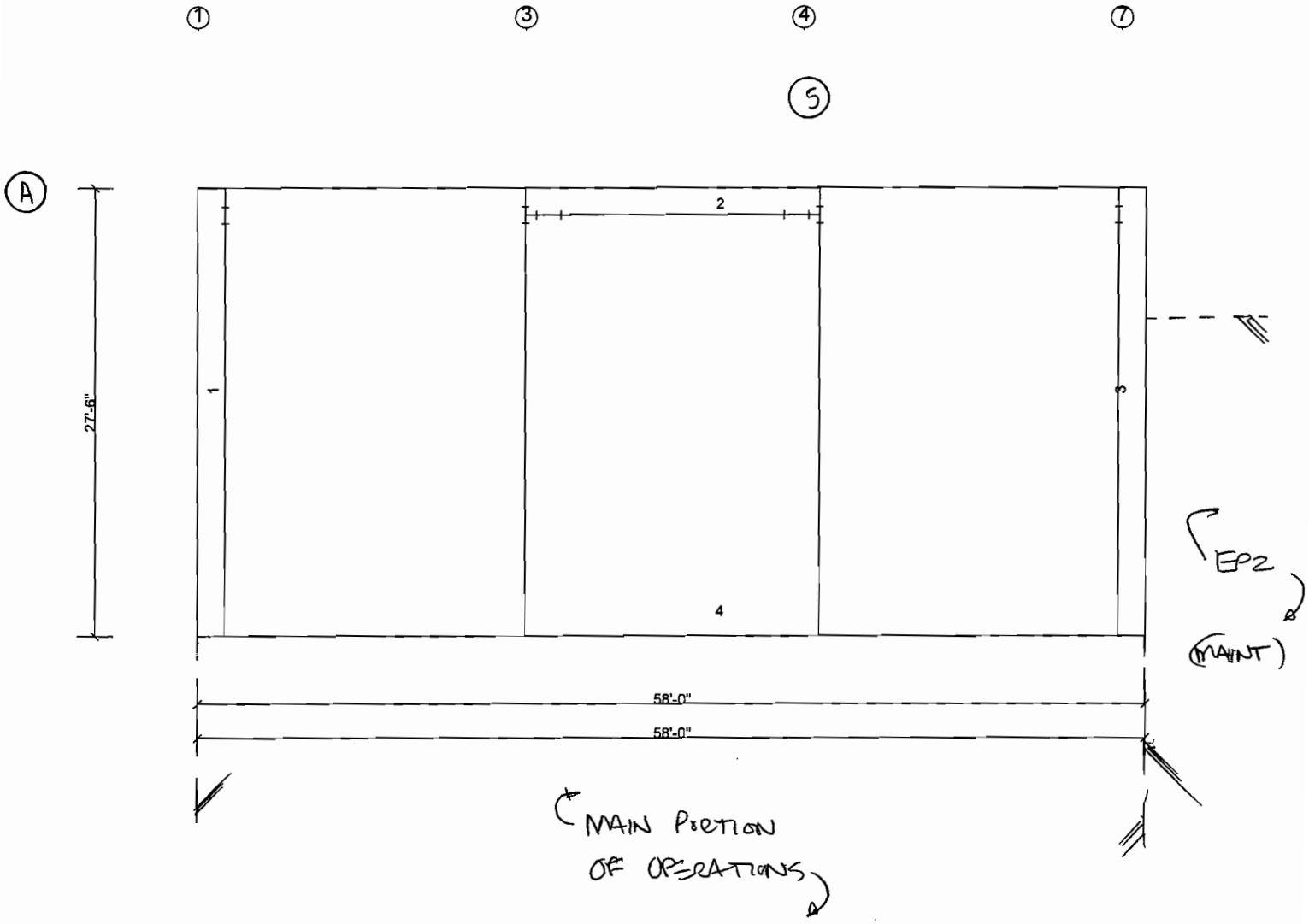
**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

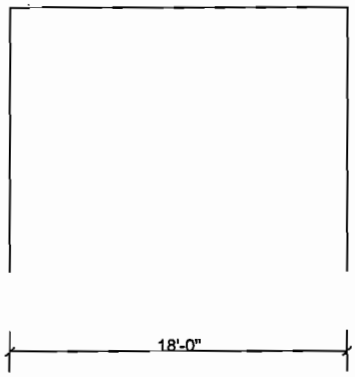
**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | 1- | 1-O | 27/6/0 | 58/0/0 | 13/8/0 | 22/10/0 | 4.000:12 | | | |


1
3
4
5
A
2
1
3
4
27'-6"
58'-0"
58'-0"
EP2
(MAINT)
MAIN PORTION
OF OPERATIONS

**Wall: 2**
Frame ID:Portal Frame

Frame Type:Portal Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 18/0/0 | | | | |
| Grid1 - Grid2 | | A-5 | | A-3 | | | | |
| Base Plate W x L (in.) | | 8 x 19 | | 8 x 19 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.0 | 0.3 | -0.0 | 0.3 | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | - | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | - | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | 3.1 | 5.1 | 2.9 | -5.1 | - | - | - |
| <WB1 | Brc | -2.9 | -5.1 | -3.1 | 5.1 | - | - | - |
| WB2> | Brc | 3.1 | 5.1 | 2.9 | -5.1 | - | - | - |
| <WB2 | Brc | -2.9 | -5.1 | -3.1 | 5.1 | - | - | - |
| EB> | Brc | 0.5 | 0.8 | 0.5 | -0.8 | - | - | - |
| <EB | Brc | -0.5 | -0.8 | -0.5 | 0.8 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) | Load Case | Hrz Right (Hx) | Load Case | Hrz In (-Hz) | Load Case | Hrz Out (Hz) | Load Case | Uplift (-Vy) | Load Case | Vrt Down (Vy) | Load Case | Mom cw (-Mzz) | Load Case | Mom ccw (Mzz) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | (k) | | (k) | | (k) | | (k) | | (k) | | (k) | | (in-k) | | (in-k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A-5 | 2.9 | 33 | 3.1 | 28 | - | - | - | - | 4.9 | 33 | 5.4 | 28 | - | - | - | - |
| 18/0/0 | A-3 | 3.1 | 32 | 2.9 | 29 | - | - | - | - | 4.9 | 29 | 5.4 | 32 | - | - | - | - |

## Wall: 2

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

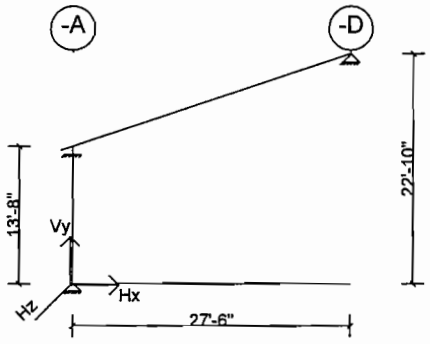
**Wall: 2, Frame at: 1/8/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 31 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 33 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Wall: 2, Frame at: 1/8/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.
**Reactions - Unfactored Load Type at Frame Cross Section:** 1

TO MAIN FRAME COLUMN. (TYP.)

| Type | | Exterior Column | | Rafter | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 27/6/0 | | | | |
| Grid1 - Grid2 | | -A | | -D | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | - | 1.3 | - | 0.9 | - | - | - |
| CG | Frm | - | 0.9 | - | 0.7 | - | - | - |
| L> | Frm | - | 3.7 | - | 2.7 | - | - | - |
| <L | Frm | - | 3.7 | - | 2.7 | - | - | - |
| S> | Frm | - | 0.5 | - | 0.3 | - | - | - |
| <S | Frm | - | 0.5 | - | 0.3 | - | - | - |
| S | Frm | - | 0.5 | - | 0.3 | - | - | - |
| SD | Frm | - | 0.3 | - | 1.4 | - | - | - |
| W1> | Frm | 0.9 | -3.0 | 2.5 | -1.3 | - | - | - |
| <W1 | Frm | -0.8 | -3.5 | 1.1 | -2.4 | - | - | - |
| W2> | Frm | 0.4 | -1.3 | 1.0 | -0.5 | - | - | - |
| <W2 | Frm | -1.3 | -1.9 | -0.3 | -1.6 | - | - | - |
| WP | Frm | 1.2 | -4.1 | 3.4 | -1.9 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | 3.7 | - | 2.7 | - | - | - |
| E> | Frm | 0.1 | -0.0 | 0.2 | 0.1 | - | - | - |
| EG+ | Frm | - | 0.1 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | 0.0 | -0.2 | -0.1 | - | - | - |
| EG- | Frm | - | -0.1 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -A | 1.3 | 11 | 1.2 | 12 | - | - | - | - | 3.3 | 17 | 5.9 | 1 | - | - | - | - |
| 27/6/0 | -D | 0.3 | 11 | 3.4 | 12 | - | - | - | - | 1.8 | 14 | 4.3 | 1 | - | - | - | - |

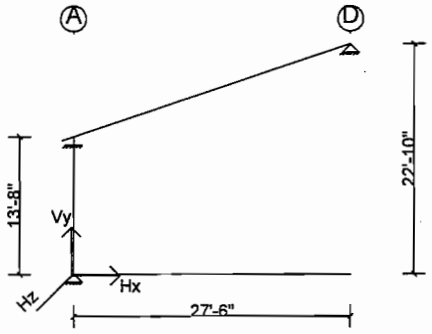
## Wall: 2, Frame at: 20/0/0

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 31 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 39 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 43 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 50 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Wall: 2, Frame at: 20/0/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 5**

| Type | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | |
| Grid1 - Grid2 | | 5-A | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | |
| Load Type | Desc. | Hx | Vy | | | | |
| D | Frm | - | 1.9 | - | - | - | - |
| CG | Frm | - | 1.5 | - | - | - | - |
| L> | Frm | - | 6.0 | - | - | - | - |
| <L | Frm | - | 6.0 | - | - | - | - |
| S> | Frm | - | 0.8 | - | - | - | - |
| <S | Frm | - | 0.8 | - | - | - | - |
| S | Frm | - | 0.8 | - | - | - | - |
| SD | Frm | - | 0.6 | - | - | - | - |
| W1> | Frm | 1.6 | -4.9 | - | - | - | - |
| <W1 | Frm | -1.3 | -5.5 | - | - | - | - |
| W2> | Frm | 0.6 | -2.1 | - | - | - | - |
| <W2 | Frm | -2.2 | -2.7 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| L | Frm | - | 6.0 | - | - | - | - |
| E> | Frm | 0.2 | -0.0 | - | - | - | - |
| EG+ | Frm | - | 0.1 | - | - | - | - |
| <E | Frm | -0.2 | 0.0 | - | - | - | - |
| EG- | Frm | - | -0.1 | - | - | - | - |
| WP | Frm | 2.0 | -5.2 | - | - | - | - |
| WB1> | Brc | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) | Load Case | Hrz Right (Hx) | Load Case | Hrz In (-Hz) | Load Case | Hrz Out (Hz) | Load Case | Uplift (-Vy) | Load Case | Vrt Down (Vy) | Load Case | Mom cw (-Mzz) | Load Case | Mom ccw (Mzz) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

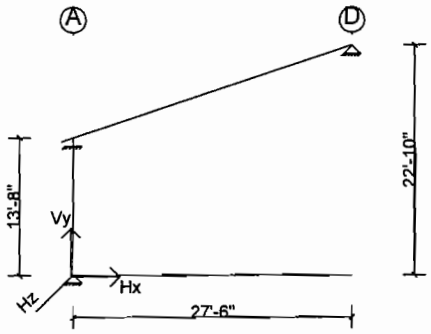
| | | (k) | | (k) | | (k) | | (k) | | (k) | | (k) | | (in-k) | | (in-k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5-A | 2.2 | 11 | 2.0 | 30 | - | - | - | - | 4.3 | 13 | 9.5 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | A-5 | Portal Frame is next to column. See portal frame section for reactions |

**Wall: 2, Frame at: 38/0/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 3**

| Type | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | |
| Grid1 - Grid2 | | 3-A | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | |
| Load Type | Desc. | Hx | Vy | | | | |
| D | Frm | - | 1.9 | - | - | - | - |
| CG | Frm | - | 1.5 | - | - | - | - |
| L> | Frm | - | 6.0 | - | - | - | - |
| <L | Frm | - | 6.0 | - | - | - | - |
| S> | Frm | - | 0.8 | - | - | - | - |
| <S | Frm | - | 0.8 | - | - | - | - |
| S | Frm | - | 0.8 | - | - | - | - |
| SD | Frm | - | 0.6 | - | - | - | - |
| W1> | Frm | 1.6 | -4.9 | - | - | - | - |
| <W1 | Frm | -1.3 | -5.5 | - | - | - | - |
| W2> | Frm | 0.6 | -2.1 | - | - | - | - |
| <W2 | Frm | -2.2 | -2.7 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| L | Frm | - | 6.0 | - | - | - | - |
| E> | Frm | 0.2 | -0.0 | - | - | - | - |
| EG+ | Frm | - | 0.1 | - | - | - | - |
| <E | Frm | -0.2 | 0.0 | - | - | - | - |
| EG- | Frm | - | -0.1 | - | - | - | - |
| WP | Frm | 2.0 | -5.2 | - | - | - | - |
| WB1> | Brc | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) | Load Case | Hrz Right (Hx) | Load Case | Hrz In (-Hz) | Load Case | Hrz Out (Hz) | Load Case | Uplift (-Vy) | Load Case | Vrt Down (Vy) | Load Case | Mom cw (-Mzz) | Load Case | Mom ccw (Mzz) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | (k) | | (k) | | (k) | | (k) | | (k) | | (k) | | (in-k) | | (in-k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3-A | 2.2 | 11 | 2.0 | 30 | - | - | - | - | 4.3 | 13 | 9.5 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | A-3 | Portal Frame is next to column. See portal frame section for reactions |

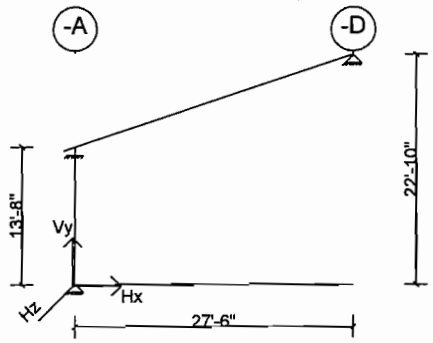
**Wall: 2, Frame at: 56/4/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 31 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 33 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Wall: 2, Frame at: 56/4/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Rafter | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 27/6/0 | | | | |
| Grid1 - Grid2 | | -A | | -D | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | - | 1.4 | - | 1.0 | - | - | - |
| CG | Frm | - | 1.0 | - | 0.8 | - | - | - |
| L> | Frm | - | 3.9 | - | 3.1 | - | - | - |
| <L | Frm | - | 3.9 | - | 3.1 | - | - | - |
| S> | Frm | - | 0.5 | - | 0.4 | - | - | - |
| <S | Frm | - | 0.5 | - | 0.4 | - | - | - |
| S | Frm | - | 0.5 | - | 0.4 | - | - | - |
| SD | Frm | - | 0.3 | - | 1.4 | - | - | - |
| W1> | Frm | 0.9 | -3.1 | 2.6 | -1.5 | - | - | - |
| <W1 | Frm | -0.8 | -3.9 | 1.4 | -2.8 | - | - | - |
| W2> | Frm | 0.4 | -1.4 | 1.1 | -0.7 | - | - | - |
| <W2 | Frm | -1.3 | -2.3 | -0.1 | -2.0 | - | - | - |
| WP | Frm | 1.2 | -4.2 | 3.5 | -2.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | 3.9 | - | 3.1 | - | - | - |
| E> | Frm | 0.1 | -0.0 | 0.2 | 0.1 | - | - | - |
| EG+ | Frm | - | 0.1 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | 0.0 | -0.2 | -0.1 | - | - | - |
| EG- | Frm | - | -0.1 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -A | 1.3 | 11 | 1.2 | 12 | - | - | - | - | 3.4 | 17 | 6.3 | 1 | - | - | - | - |
| 27/6/0 | -D | 0.1 | 29 | 3.5 | 12 | - | - | - | - | 2.3 | 14 | 4.8 | 1 | - | - | - | - |

## Bracing - Summary Report

### Shape: Operations Building

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

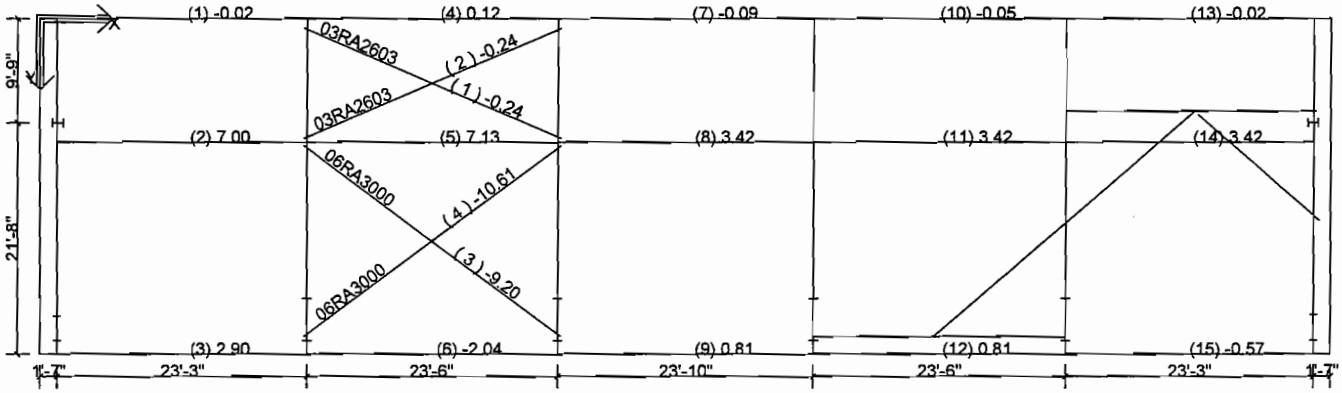
**Operations Building : Mezzanine 1 @ 12/9/0**

| Floor Type | Non-Composite | Loading Type | Office |
|---|---|---|---|
| Top of Floor | 12/9/0 | Floor Dead Load | 50.00 psf |
| Total Thickness of Deck + Topping | 0/3/0 | Floor Live Load | 100.00 psf Not Reducible |
| Top of Joist | 12/6/0 | Collateral Load | 5.00 psf |
| Min. Clearance from Floor to Joist | 11/4/0 | Partition Load: | 10.00 psf |
| Min. Clearance from Floor to Rafter | 9/6/0 | Floor Live Load Deflection | 360 |
| Mezzanine Category | Entire Floor | Floor Dead + Floor Live Deflection | 240 |
| Bracing Category | Unbraced | | |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |




**Diagonal Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 26.18 | 28.1 | -0.24 | 1.0000 | 1.0000 | 0.100 | 0.700<E | passed | |
| 2 | R 0.375 | 26.18 | 28.1 | -0.24 | 1.0000 | 1.0000 | 0.100 | 0.700E> | passed | |
| 3 | R 0.75 | 29.95 | 41.6 | -9.20 | 1.0000 | 1.0000 | 0.854 | 1.0<W1 | passed | |
| 4 | R 0.75 | 29.94 | 41.6 | -10.61 | 1.0000 | 1.0000 | 0.985 | 1.0W2> | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 3/16 in., F = 0.24k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 0.24k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 3/16 in., F = 0.24k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 0.24k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot w/ Backing Plate: web thk = 3/16 in., F = 9.20k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 9.20k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot w/ Backing Plate: web thk = 1/8 in., F = 10.61k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot w/ Backing Plate: web thk = 3/16 in., F = 10.61k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |

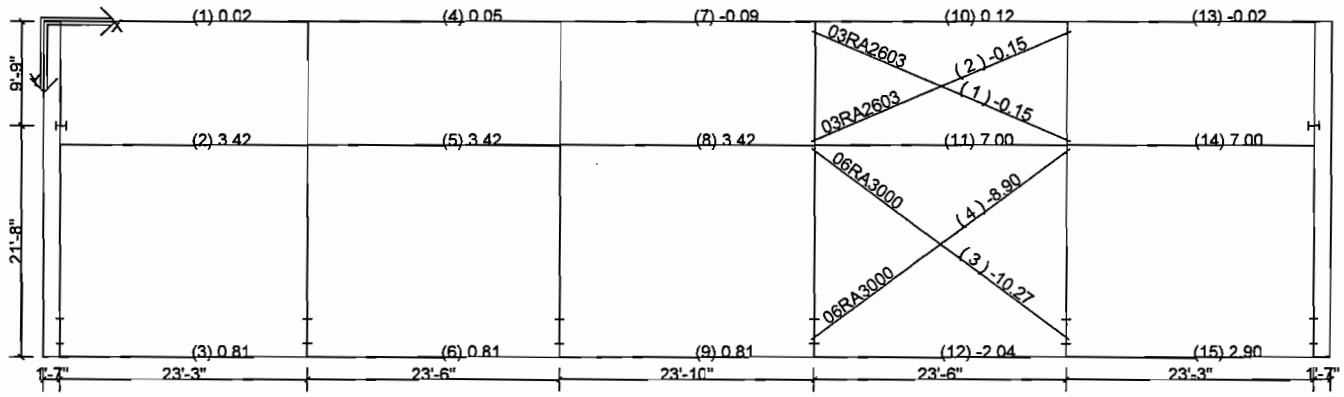
SPANDREL & ROOF BEAM REPLACE THESE

**Strut Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Description |
|---|---|---|---|---|---|---|---|---|---|
| 14 | 3P 6x3/16x0.1345x8 | 23.25 | 3.42 | 1.0000 | 1.0000 | 0.274 | 1.0<W2 | passed | End Bay Strut |
| 15 | 3P 6x3/16x0.1345x8 | 23.25 | -0.57 | 1.0000 | 1.0000 | 0.112 | 1.0W1> | passed | Eave Strut, Collector |

| Mem. | End | Strut Connection Design Information |
|---|---|---|
| 14 | Left | Frame Clip Invalid Mark. w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 7/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip Invalid Mark. w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 15 | Left | Frame Clip 6.00x-20.96x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, Me = 0.60 k-in, web punching shear OK, clip to web weld 3/16 fillet one side, clip to flange weld 3/16 fillet both sides => passed |

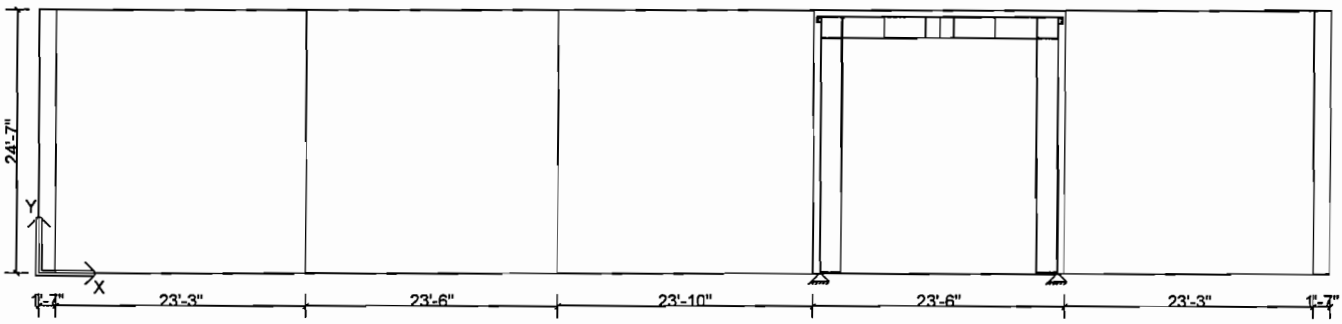
| | | |
|---|---|---|
| | Right | Frame Clip 6.00x-20.71x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, Me = 0.00 k-in, web punching shear OK, clip to web weld 3/16 fillet one side, clip to flange weld 3/16 fillet both sides => passed |




**Diagonal Bracing Member Design Summary: Roof B**

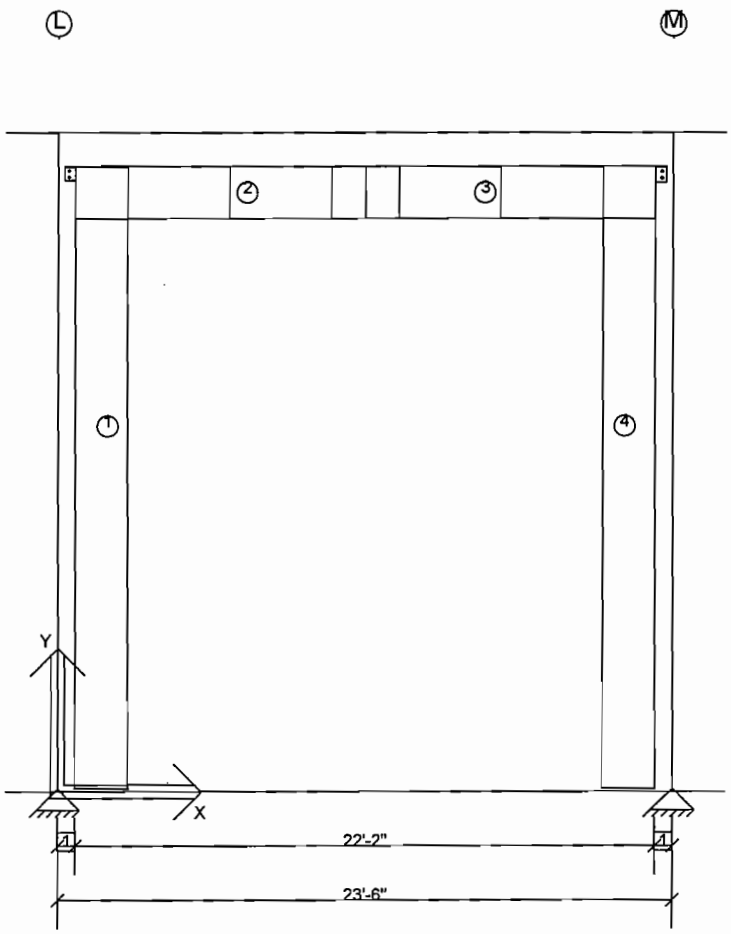
| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 26.18 | 28.1 | -0.15 | 1.0000 | 1.0000 | 0.062 | 0.700E> | passed | |
| 2 | R 0.375 | 26.18 | 28.1 | -0.15 | 1.0000 | 1.0000 | 0.062 | 0.700<E | passed | |
| 3 | R 0.75 | 29.94 | 41.6 | -10.27 | 1.0000 | 1.0000 | 0.953 | 1.0W2> | passed | |
| 4 | R 0.75 | 29.95 | 41.6 | -8.90 | 1.0000 | 1.0000 | 0.827 | 1.0<W1 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 3/16 in., F = 0.15k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 0.15k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 3/16 in., F = 0.15k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 0.15k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot w/ Backing Plate: web thk = 3/16 in., F = 10.27k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 10.27k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 8.90k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 8.90k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |




| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | Force = 9.31k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x6x3/8 w/ (2) 3/4 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Left Main | Force = 9.31k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x11-3/4x3/8 w/ (2) 3/4 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |
| Right Portal | Force = 10.97k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x7x3/8 w/ (2) 7/8 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Right Main | Force = 10.97k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x12-5/8x3/8 w/ (2) 7/8 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |

Frame Cross Section: 1




**Dimension Key**
1 8"
2 1'-3 1/2"

**Frame Clearances**
Horiz. Clearance between members 1(CX111) and 4(CX115): 18'-2"
Vert. Clearance at member 1(CX111): 21'-11 5/16"
Vert. Clearance at member 4(CX115): 21'-11 5/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

— SHY OF CLEAR NEEDED, WILL RERUN TO RAISE INTO PURLIN LINES @ ABOVE CEILING @ 22'-3"

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 23.86 | 815.8 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 11.08 | 315.9 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 11.08 | 315.9 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 23.86 | 815.8 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 2263.5 (p) (Includes all plates)
Frame Pricing Weight = 2387.3 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 23/6/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 1**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 23/6/0 | | | | |
| Grid1 - Grid2 | | 1-L | | 1-M | | | | |
| Base Plate W x L (in.) | | 11 x 25 | | 11 x 25 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.0 | 1.1 | -0.0 | 1.1 | - | - | - |
| FD | Frm | 0.3 | 6.4 | -0.3 | 6.4 | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.6 | 12.7 | -0.6 | 12.7 | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| E> | Frm | -1.6 | -2.0 | -1.6 | 2.0 | - | - | - |
| EG+ | Frm | - | 0.2 | - | 0.2 | - | - | - |
| <E | Frm | 1.6 | 2.0 | 1.6 | -2.0 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EG- | Frm | - | -0.2 | - | -0.2 | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | 4.4 | 10.2 | 4.2 | -10.2 | - | - | - |
| <WB1 | Brc | -4.5 | -11.0 | -4.8 | 11.0 | - | - | - |
| WB2> | Brc | 5.6 | 13.0 | 5.4 | -13.0 | - | - | - |
| <WB2 | Brc | -3.4 | -8.2 | -3.6 | 8.2 | - | - | - |
| EB> | Brc | 2.3 | 3.8 | 2.2 | -3.8 | - | - | - |
| <EB | Brc | -2.2 | -3.8 | -2.3 | 3.8 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 1-L | 4.4 | 54 | 5.9 | 59 | - | - | - | - | 6.5 | 54 | 26.7 | 63 | - | - | - | - |
| 23/6/0 | 1-M | 5.1 | 53 | 5.2 | 60 | - | - | - | - | 8.5 | 60 | 25.3 | 57 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 2.3 | 2.1 |
| FD | 0.0 | 0.0 | 12.8 | 12.8 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 25.4 | 25.4 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 3.2 | 3.2 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.3 | 0.3 |
| <E | 3.2 | 3.2 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.3 | 0.3 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 8.6 | 8.6 | 0.0 | 0.0 |
| <WB1 | 9.3 | 9.3 | 0.0 | 0.0 |
| WB2> | 11.0 | 11.0 | 0.0 | 0.0 |
| <WB2 | 7.0 | 7.0 | 0.0 | 0.0 |
| EB> | 4.5 | 4.5 | 0.0 | 0.0 |
| <EB | 4.5 | 4.5 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 1-L | 1 | 0.375 | 11 | 25 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 23/6/0 | 1-M | 4 | 0.375 | 11 | 25 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 21.83 | 23.375 | N/A | N/A | N/A | 0.3750 | 4.500 | Both | F-FP,W-OS-0.1875 |
| 1 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |
| 2 | 1 | S1 | 3.86 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 2 | 2 | S1 | 7.76 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1 | S1 | 5.19 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 2 | S1 | 1.29 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 1 | S3 | 21.83 | 23.375 | N/A | N/A | N/A | 0.3750 | 4.500 | Both | F-FP,W-OS-0.1875 |
| 4 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 1 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 4 | 2 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 78 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 77 | -0.3 | 1.2 | 149.4 | Thin plate | 106.0 | 408.6 |
| 2 | 1 | 78 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 77 | -0.3 | 1.2 | 149.4 | Thin plate | 106.0 | 408.6 |
| 3 | 1 | 77 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 78 | -0.3 | 1.2 | 149.4 | Thin plate | 106.0 | 408.6 |
| 4 | 2 | 77 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 78 | -0.3 | 1.2 | 149.4 | Thin plate | 106.0 | 408.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 0 | | 23/7/0 | SFB4106 | |
| 0 | | 23/6/8 | SFB4106 | |

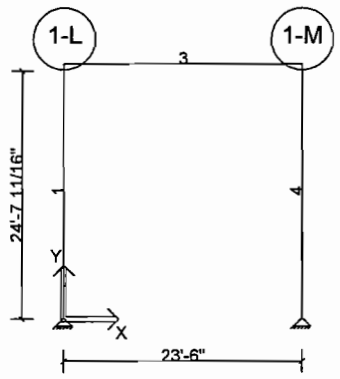
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 21.86 | 24.00 | 59 | 59 | -14.1 | -6.1 | -1501.1 | 0.0 | 152.9 | 8.4 | 1805.9 | 488.6 | 0.88 | 0.72 |
| 2 | 1.00 | 24.00 | 59 | 57 | -5.7 | -8.5 | -1413.0 | 0.0 | 156.5 | 8.4 | 1805.9 | 488.6 | 0.80 | 1.01 |
| 3 | 1.00 | 24.00 | 59 | 55 | -5.7 | -8.7 | 1456.4 | 0.0 | 156.5 | 8.4 | 1805.9 | 488.6 | 0.82 | 1.03 |
| 4 | 21.86 | 24.00 | 59 | 60 | 12.2 | -5.2 | 1412.5 | 0.0 | 301.4 | 8.4 | 1805.9 | 488.6 | 0.80 | 0.62 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 21.86 | 262.33 | 262.3 | 262.3 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.62 | 1.00 | 1.00 | 0.65 | 0.78 |
| 2 | 1.00 | 218.00 | 24.0 | 24.0 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.00 | 1.00 | 1.00 | 0.65 | 0.78 |
| 3 | 1.00 | 218.00 | 24.0 | 24.0 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.00 | 1.00 | 1.00 | 0.65 | 0.78 |
| 4 | 21.86 | 262.33 | 262.3 | 262.3 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.69 | 1.00 | 1.00 | 0.65 | 1.00 |

**User Defined Frame Point Loads for Cross Section: 1**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1 | k | E> | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1 | k | <E | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1 | k | EB> | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1 | k | <EB | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 4 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 4 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 4 | k | E> | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 4 | k | <E | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 4 | k | EB> | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 4 | k | <EB | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |




**Deflection Load Combinations - Framing**

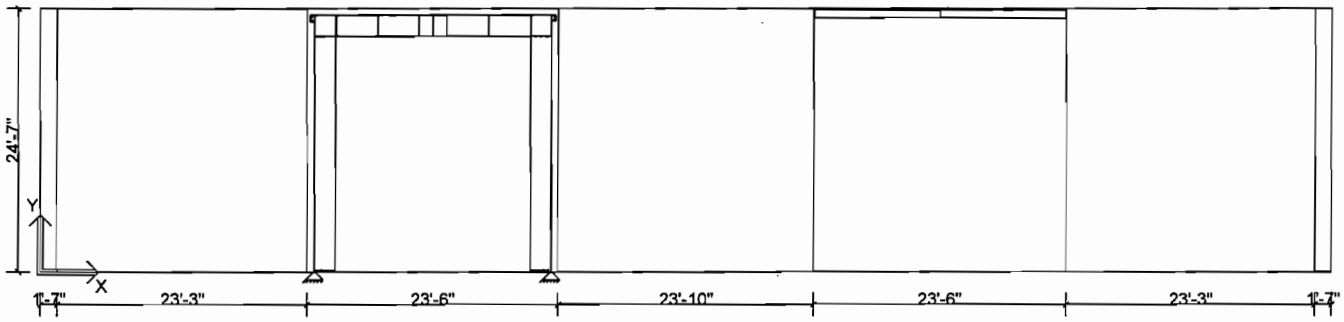
| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 14 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 15 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 18 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 19 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 20 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 23 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 24 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 25 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 26 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 27 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 28 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 1**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/206 ) | -1.328 | 4 | 2 | 23 | WB2> |
| Max. Vertical Deflection for Span 1 | ( L/26442 ) | 0.009 | 4 | 2 | 14 | WB2> |

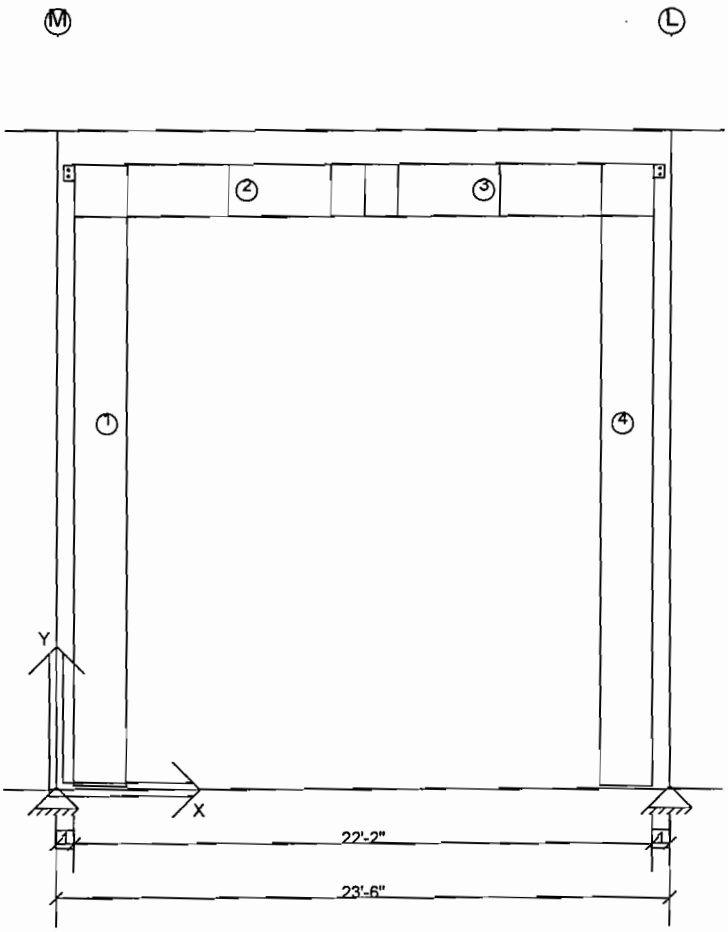
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.




| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | Force = 11.23k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x7x3/8 w/ (2) 7/8 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Left Main | Force = 11.23k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x13x3/8 w/ (2) 7/8 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |
| Right Portal | Force = 9.54k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x6x3/8 w/ (2) 3/4 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Right Main | Force = 9.54k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x11-3/8x3/8 w/ (2) 3/4 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |

Frame Cross Section: 8




**Dimension Key**
1 8"
2 1'-3 1/2"

**Frame Clearances**
Horiz. Clearance between members 1(CX115) and 4(CX111): 18'-2"
Vert. Clearance at member 1(CX115): 21'-11 5/16"
Vert. Clearance at member 4(CX111): 21'-11 5/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 23.86 | 815.8 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 11.08 | 315.9 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 11.08 | 315.9 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 10.00 | 0.3125 | 0.1345 | 24.00 | 24.00 | 23.86 | 815.8 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 2263.5 (p) (Includes all plates)
Frame Pricing Weight = 2387.3 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 23/6/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 8**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 23/6/0 | | | | |
| Grid1 - Grid2 | | 8-M | | 8-L | | | | |
| Base Plate W x L (in.) | | 11 x 25 | | 11 x 25 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.0 | 1.1 | -0.0 | 1.1 | - | - | - |
| FD | Frm | 0.3 | 6.4 | -0.3 | 6.4 | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.6 | 12.7 | -0.6 | 12.7 | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| E> | Frm | 1.6 | 2.0 | 1.6 | -2.0 | - | - | - |
| EG+ | Frm | - | 0.2 | - | 0.2 | - | - | - |
| <E | Frm | -1.6 | -2.0 | -1.6 | 2.0 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EG- | Frm | - | -0.2 | - | -0.2 | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | -4.3 | -10.5 | -4.5 | 10.5 | - | - | - |
| <WB1 | Brc | 4.9 | 11.3 | 4.7 | -11.3 | - | - | - |
| WB2> | Brc | -5.5 | -13.3 | -5.8 | 13.3 | - | - | - |
| <WB2 | Brc | 3.7 | 8.4 | 3.5 | -8.4 | - | - | - |
| EB> | Brc | -2.2 | -3.8 | -2.3 | 3.8 | - | - | - |
| <EB | Brc | 2.3 | 3.8 | 2.2 | -3.8 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 8-M | 5.3 | 60 | 5.2 | 53 | - | - | - | - | 8.8 | 60 | 25.5 | 57 | - | - | - | - |
| 23/6/0 | 8-L | 6.1 | 59 | 4.5 | 54 | - | - | - | - | 6.8 | 54 | 27.0 | 63 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 2.3 | 2.1 |
| FD | 0.0 | 0.0 | 12.8 | 12.8 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 25.4 | 25.4 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 3.2 | 3.2 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.3 | 0.3 |
| <E | 3.2 | 3.2 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.3 | 0.3 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 8.8 | 8.8 | 0.0 | 0.0 |
| <WB1 | 9.5 | 9.5 | 0.0 | 0.0 |
| WB2> | 11.2 | 11.2 | 0.0 | 0.0 |
| <WB2 | 7.1 | 7.1 | 0.0 | 0.0 |
| EB> | 4.5 | 4.5 | 0.0 | 0.0 |
| <EB | 4.5 | 4.5 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 8-M | 1 | 0.375 | 11 | 25 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 23/6/0 | 8-L | 4 | 0.375 | 11 | 25 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 21.83 | 23.375 | N/A | N/A | N/A | 0.3750 | 4.500 | Both | F-FP,W-OS-0.1875 |
| 1 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |
| 2 | 1 | S1 | 3.86 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 2 | 2 | S1 | 7.76 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1 | S1 | 5.19 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 2 | S1 | 1.29 | 23.375 | 173.79 | 2.00 | 46.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 1 | S3 | 21.83 | 23.375 | N/A | N/A | N/A | 0.3750 | 4.500 | Both | F-FP,W-OS-0.1875 |
| 4 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 1 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 4 | 2 | KN(Face) | 0.375 | 10.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 77 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 78 | -0.3 | 1.2 | 149.5 | Thin plate | 106.0 | 408.6 |
| 2 | 1 | 77 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 78 | -0.3 | 1.2 | 149.5 | Thin plate | 106.0 | 408.6 |
| 3 | 1 | 78 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 77 | -0.3 | 1.2 | 149.5 | Thin plate | 106.0 | 408.6 |
| 4 | 2 | 78 | -0.3 | 1.7 | 165.2 | Thin plate | 106.0 | 408.6 | 77 | -0.3 | 1.2 | 149.5 | Thin plate | 106.0 | 408.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 0 | | 23/6/8 | SFB4106 | |
| 0 | | 23/7/0 | SFB4106 | |

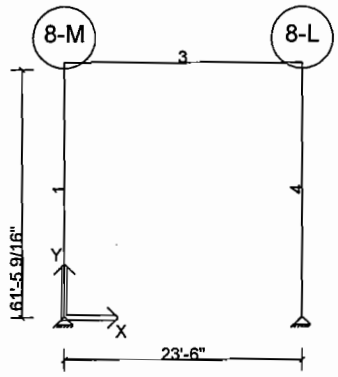
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial | Shear | Mom-x | Mom-y | Axial | Shear | Mom-x | Mom-y | Axial + | Shear |
| No. | ft | in. | Flexure | | Pr k | Vr k | Mrx in-k | Mry in-k | Pc k | Vc k | Mcx in-k | Mcy in-k | Flexure | |
| 1 | 21.86 | 24.00 | 59 | 60 | 12.5 | 5.4 | 1445.9 | 0.0 | 301.4 | 8.4 | 1805.9 | 488.6 | 0.82 | 0.64 |
| 2 | 1.00 | 24.00 | 59 | 55 | -5.9 | 8.7 | 1490.8 | 0.0 | 156.5 | 8.4 | 1805.9 | 488.6 | 0.84 | 1.03 |
| 3 | 1.00 | 24.00 | 59 | 57 | -5.9 | 8.7 | -1446.4 | 0.0 | 156.5 | 8.4 | 1805.9 | 488.6 | 0.82 | 1.03 |
| 4 | 21.86 | 24.00 | 59 | 59 | -14.4 | 6.2 | -1536.5 | 0.0 | 152.9 | 8.4 | 1805.9 | 488.6 | 0.90 | 0.74 |

| Mem. | Loc. | Lx | Ly/Lt | Lb | Ag | Afn | Ixx | Iyy | Sx | Sy | Zx | Zy | J | Cw | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ft | in. | in. | in. | in.2 | in.2 | in.4 | in.4 | in.3 | in.3 | in.3 | in.3 | in.4 | in.6 | | | | | |
| 1 | 21.86 | 262.33 | 262.3 | 262.3 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.69 | 1.00 | 1.00 | 0.65 | 1.00 |
| 2 | 1.00 | 218.00 | 24.0 | 24.0 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.00 | 1.00 | 1.00 | 0.65 | 0.78 |
| 3 | 1.00 | 218.00 | 24.0 | 24.0 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.00 | 1.00 | 1.00 | 0.65 | 0.78 |
| 4 | 21.86 | 262.33 | 262.3 | 262.3 | 9.39 | 9.39 | 1019.92 | 52.09 | 84.99 | 10.42 | 92.40 | 15.73 | 0.22 | 7306.62 | 1.62 | 1.00 | 1.00 | 0.65 | 0.78 |

**User Defined Frame Point Loads for Cross Section: 8**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1 | k | E> | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1 | k | <E | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1 | k | EB> | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1 | k | <EB | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 4 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 4 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 4 | k | E> | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 4 | k | <E | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 4 | k | EB> | Mezz | 1.35 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 4 | k | <EB | Mezz | -1.35 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 14 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 15 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 18 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 19 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 20 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 23 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 24 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 25 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 26 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 27 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 28 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 8**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/201 ) | 1.359 | 1 | 2 | 23 | WB2> |
| Max. Vertical Deflection for Span 1 | ( L/25830 ) | -0.009 | 4 | 2 | 14 | WB2> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

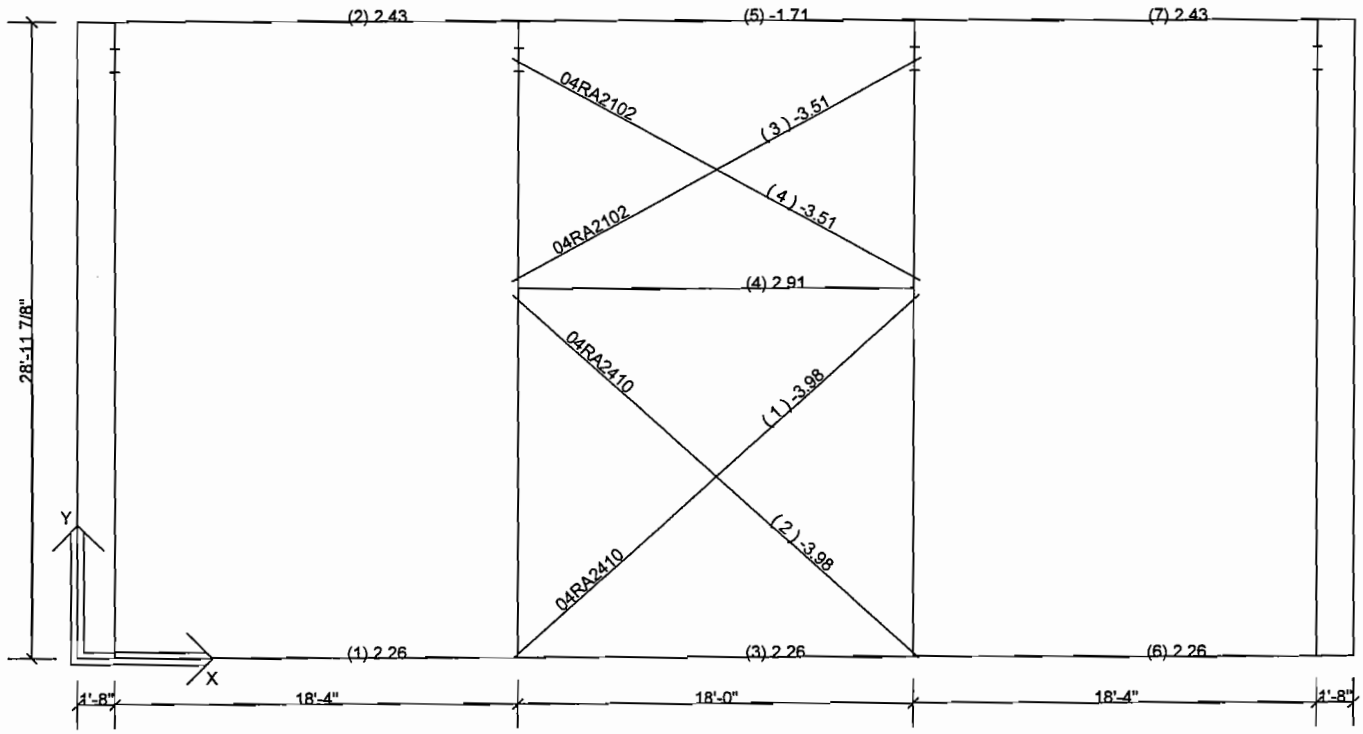
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Bracing**

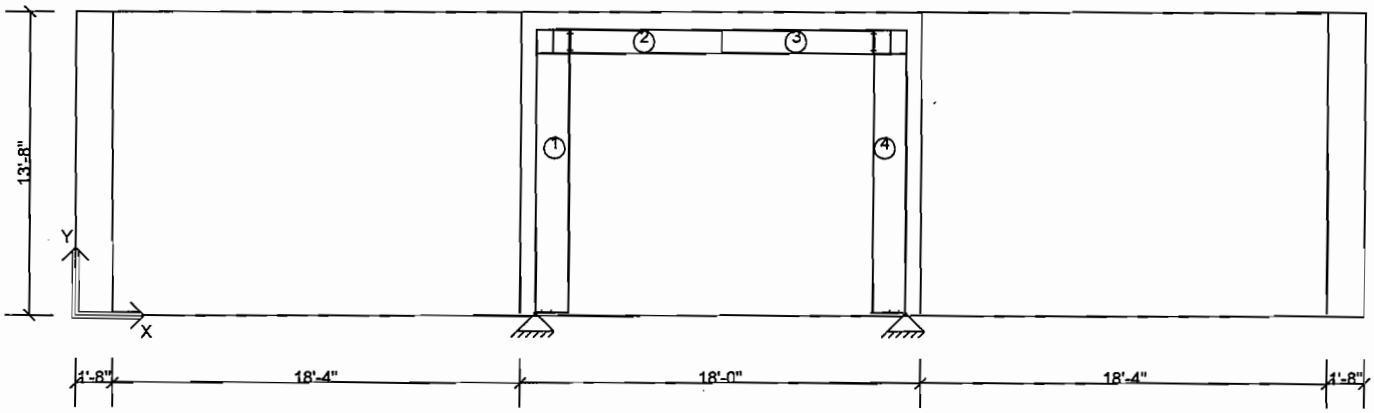
| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |




**Diagonal Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.5 | 24.80 | 41.3 | -3.98 | 1.0000 | 1.0000 | 0.706 | 1.0<W1 | passed | |
| 2 | R 0.5 | 24.80 | 41.3 | -3.98 | 1.0000 | 1.0000 | 0.706 | 1.0W2> | passed | |
| 3 | R 0.5 | 21.14 | 31.8 | -3.51 | 1.0000 | 1.0000 | 0.623 | 1.0<W1 | passed | |
| 4 | R 0.5 | 21.14 | 31.8 | -3.51 | 1.0000 | 1.0000 | 0.623 | 1.0W2> | passed | |

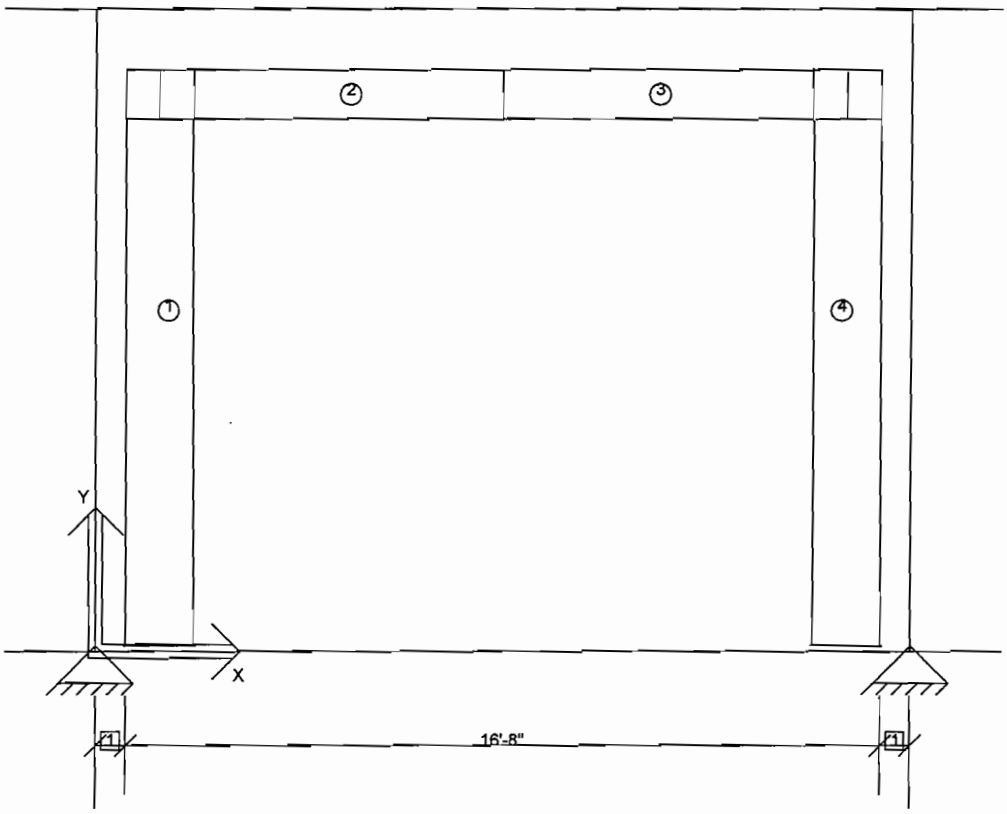
| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 3.98k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.98k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 3.98k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.98k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 1/8 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |




| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | Main frame rafter depth is less than MZE length of 14-3/8 => Not Designed <= |
| Left Main | Main frame rafter depth is less than MZE length of 14-3/8 => Not Designed <= |
| Right Portal | *FAILED* Main frame rafter depth is less than MZE length of 14-1/8 => Not Designed <= |
| Right Main | *FAILED* Main frame rafter depth is less than MZE length of 14-1/8 => Not Designed <= |

Frame Cross Section: A

WILL BE HAND FIXED AFTER APPROVAL.




**Dimension Key**
1 8"
2 1'-4 3/16"

**Frame Clearances**
Horiz. Clearance between members 1(CX116) and 4(CX116): 13'-8"
Vert. Clearance at member 1(CX116): 11'-9"
Vert. Clearance at member 4(CX116): 11'-9"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.00 | 0.1875 | 0.1345 | 18.00 | 18.00 | 12.75 | 225.6 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3125 | 0.1345 | 13.00 | 13.00 | 8.33 | 134.2 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.3125 | 0.1345 | 13.00 | 13.00 | 8.33 | 134.2 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 6.00 | 0.1875 | 0.1345 | 18.00 | 18.00 | 12.75 | 225.6 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 719.6 (p) (Includes all plates)

Frame Pricing Weight = 749.5 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 18/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 18/0/0 | | | | |
| Grid1 - Grid2 | | A-5 | | A-3 | | | | |
| Base Plate W x L (in.) | | 8 x 19 | | 8 x 19 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.0 | 0.3 | -0.0 | 0.3 | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | - | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | - | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | 3.1 | 5.1 | 2.9 | -5.1 | - | - | - |
| <WB1 | Brc | -2.9 | -5.1 | -3.1 | 5.1 | - | - | - |
| WB2> | Brc | 3.1 | 5.1 | 2.9 | -5.1 | - | - | - |
| <WB2 | Brc | -2.9 | -5.1 | -3.1 | 5.1 | - | - | - |
| EB> | Brc | 0.5 | 0.8 | 0.5 | -0.8 | - | - | - |
| <EB | Brc | -0.5 | -0.8 | -0.5 | 0.8 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A-5 | 2.9 | 33 | 3.1 | 28 | - | - | - | - | 4.9 | 33 | 5.4 | 28 | - | - | - | - |
| 18/0/0 | A-3 | 3.1 | 32 | 2.9 | 29 | - | - | - | - | 4.9 | 29 | 5.4 | 32 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 0.7 | 0.7 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |

| | | | | |
|---|---|---|---|---|
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 6.0 | 6.0 | 0.0 | 0.0 |
| <WB1 | 6.0 | 6.0 | 0.0 | 0.0 |
| WB2> | 6.0 | 6.0 | 0.0 | 0.0 |
| <WB2 | 6.0 | 6.0 | 0.0 | 0.0 |
| EB> | 1.0 | 1.0 | 0.0 | 0.0 |
| <EB | 1.0 | 1.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A-5 | 1 | 0.375 | 8 | 19 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 18/0/0 | A-3 | 4 | 0.375 | 8 | 19 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 11.63 | 17.625 | N/A | N/A | N/A | 0.3125 | 2.500 | Both | F-FP,W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1644 | 0.1875 | 2.500 | Opposite Fillet | W-BS-0.1875 |
| 4 | 1 | S3 | 11.63 | 17.625 | N/A | N/A | N/A | 0.3125 | 2.500 | Both | F-FP,W-OS-0.1875 |
| 4 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1644 | 0.1875 | 2.500 | Opposite Fillet | W-BS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 14.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 14.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 1 | KN(Face) | 0.375 | 6.00 | 14.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 14.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 2 | -0.0 | 0.1 | 1.9 | Thin plate | 106.0 | 232.4 | 0 | 0.0 | 0.1 | 0.0 | Thin plate | 106.0 | 232.4 |
| 2 | 1 | 2 | -0.0 | 0.1 | 1.9 | Thin plate | 106.0 | 232.4 | 0 | 0.0 | 0.1 | 0.0 | Thin plate | 106.0 | 232.4 |
| 3 | 1 | 1 | -0.0 | 0.1 | 1.9 | Thin plate | 106.0 | 234.0 | 0 | 0.0 | 0.1 | 0.0 | Thin plate | 106.0 | 234.0 |
| 4 | 2 | 1 | -0.0 | 0.1 | 1.9 | Thin plate | 106.0 | 234.0 | 0 | 0.0 | 0.1 | 0.0 | Thin plate | 106.0 | 234.0 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| 1 | 11.66 | 18.00 | 28 | 28 | -5.4 | -3.1 | -439.9 | 0.0 | 71.5 | 11.1 | 570.6 | 105.6 | 0.81 | 0.28 |
| 2 | 0.75 | 13.00 | 33 | 28 | -3.1 | 5.2 | 422.0 | 0.0 | 141.5 | 16.3 | 908.8 | 176.6 | 0.48 | 0.32 |
| 3 | 0.75 | 13.00 | 29 | 32 | -3.1 | -5.2 | 422.0 | 0.0 | 141.5 | 16.3 | 908.8 | 176.6 | 0.48 | 0.32 |
| 4 | 11.66 | 18.00 | 32 | 32 | -5.4 | 3.1 | -440.0 | 0.0 | 71.5 | 11.1 | 570.6 | 105.6 | 0.81 | 0.28 |

| Mem. | Loc. | Lx | Ly/Lt | Lb | Ag | Afn | Ixx | Iyy | Sx | Sy | Zx | Zy | J | Cw | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ft | in. | in. | in. | in.2 | in.2 | in.4 | in.4 | in.3 | in.3 | in.3 | in.3 | in.4 | in.6 | | | | | |
| 1 | 11.66 | 139.98 | 140.0 | 140.0 | 4.62 | 4.62 | 239.85 | 6.75 | 26.65 | 2.25 | 30.48 | 3.45 | 0.04 | 535.70 | 1.66 | 1.00 | 1.00 | 0.65 | 0.72 |
| 2 | 0.75 | 164.00 | 15.5 | 15.5 | 5.41 | 5.41 | 172.18 | 11.25 | 26.49 | 3.75 | 28.94 | 5.68 | 0.13 | 452.84 | 1.00 | 1.00 | 1.08 | 0.99 | 0.84 |
| 3 | 0.75 | 164.00 | 15.5 | 15.5 | 5.41 | 5.41 | 172.18 | 11.25 | 26.49 | 3.75 | 28.94 | 5.68 | 0.13 | 452.84 | 1.00 | 1.00 | 1.08 | 0.99 | 0.84 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 11.66 | 139.98 | 140.0 | 140.0 | 4.62 | 4.62 | 239.85 | 6.75 | 26.65 | 2.25 | 30.48 | 3.45 | 0.04 | 535.70 | 1.66 | 1.00 | 1.00 | 0.65 | 0.72 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 5 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 6 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 7 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 8 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 9 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 13 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 14 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 15 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 16 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 17 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 18 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 22 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 23 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 24 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: A**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/238 ) | 0.613 | 1 | 2 | 21 | <WB2 |
| Max. Vertical Deflection for Span 1 | ( L/46881 ) | -0.004 | 4 | 2 | 12 | <WB2 |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Secondary - Summary Report

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SS | D + CG + S + SS |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 12) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 12) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 8 and 9) |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 9 and 10) |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 10 and 11) |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 11 and 12) |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |

| | | | | |
|---|---|---|---|---|
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |
| 4 | System | 1.000 | 0.700 E> | E> |
| 5 | System | 1.000 | 0.700 <E | <E |

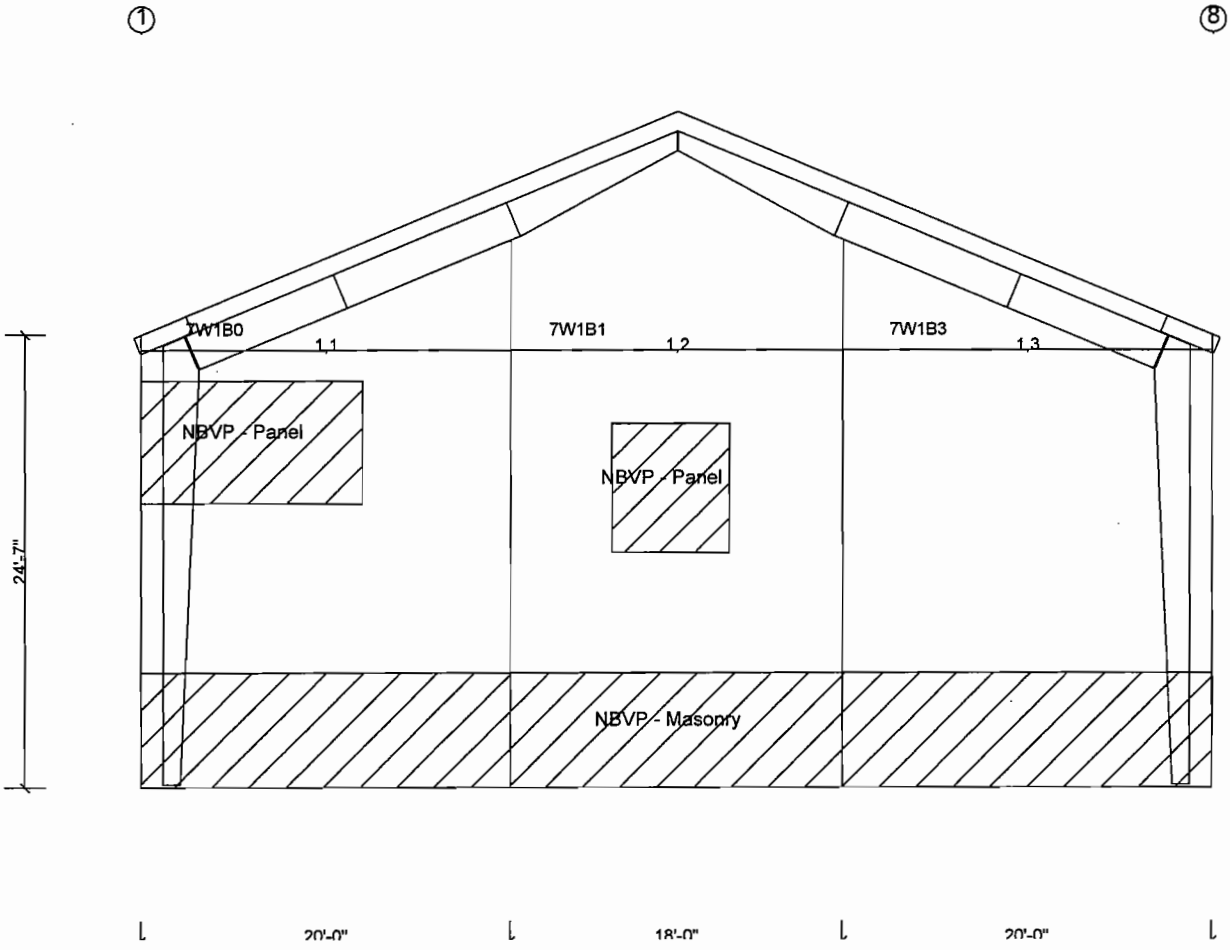
**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 S + 1.0 SD | S + SD |
| 6 | System | 1.000 | 240 | 1.0 S + 1.0 SS | S + SS |
| 7 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 8 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 9 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 0.500 <E | <E |

**Wall: 1**


①
⑧
7W1B0
1,1
7W1B1
1,2
7W1B3
1,3
NBVP - Panel
NBVP - Panel
NBVP - Masonry
24'-7"
20'-0"
18'-0"
20'-0"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 7.00 | 0.1875 | 0.1345 | 15.00 | 15.00 | 10.00 | 156.0 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 7.00 | 0.1875 | 0.1345 | 15.00 | 15.00 | 9.95 | 152.0 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 308.0 (p) (Includes all plates)
Frame Pricing Weight = 308.0 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 1,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 1,1 | 2 | ST | 0.375 | 10.00 | 4.50 | 55 | 0.750 | A325X/ST | 3 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO/FI | 4.69 | 4.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 1,1 | 2 | 1 | 0.00 | -5.13 | 0.00 | 5.13 | 0.0 | 1.99 | 0.19 | 0.24 | 0.25 | 0.55 | OK->CopedBeamFlexure | 0.0994 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 20/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 10.00 | 15.00 | 1 | 1 | 0.0 | -4.3 | -280.9 | 0.0 | 151.5 | 13.4 | 289.9 | 105.6 | 0.97 | 0.32 |
| 25001 | 0.00 | 15.00 | 1 | 1 | 0.0 | 5.1 | -280.9 | 0.0 | 151.5 | 13.4 | 289.9 | 105.6 | 0.97 | 0.38 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 10.00 | 240.00 | 240.0 | 240.0 | 4.59 | 4.59 | 179.06 | 10.72 | 23.87 | 3.06 | 26.63 | 4.66 | 0.04 | 588.11 | 1.14 | 1.00 | 1.06 | 0.52 | 1.00 |
| 25001 | 0.00 | 240.00 | 240.0 | 240.0 | 4.59 | 4.59 | 179.06 | 10.72 | 23.87 | 3.06 | 26.63 | 4.66 | 0.04 | 588.11 | 1.14 | 1.00 | 1.06 | 0.52 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1054 ) | 0.228 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=1,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 7.00 | 0.1875 | 0.1345 | 14.00 | 14.00 | 8.95 | 132.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 7.00 | 0.1875 | 0.1345 | 14.00 | 14.00 | 8.95 | 132.3 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 264.6 (p) (Includes all plates)
Frame Pricing Weight = 264.6 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO/FI | 4.67 | 3.00 |
| 1,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO/FI | 4.69 | 3.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,2 | 1 | 1 | 0.00 | -6.05 | 0.00 | 6.05 | 0.0 | 1.03 | 0.44 | 0.55 | 0.26 | 0.58 | OK->CopedBeamFlexure | 0.1021 | 0.0884 |
| 1,2 | 2 | 1 | 0.00 | -6.05 | 0.00 | 6.05 | 0.0 | 1.03 | 0.44 | 0.55 | 0.26 | 0.58 | OK->CopedBeamFlexure | 0.1024 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.00 | 14.00 | 1 | 1 | 0.0 | -6.1 | -338.5 | 0.0 | 147.1 | 14.5 | 333.5 | 105.5 | 1.01 | 0.42 |
| 25001 | 0.00 | 14.00 | 1 | 1 | 0.0 | 6.1 | -338.5 | 0.0 | 147.1 | 14.5 | 333.5 | 105.5 | 1.01 | 0.42 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.00 | 216.00 | 216.0 | 216.0 | 4.46 | 4.46 | 153.56 | 10.72 | 21.94 | 3.06 | 24.37 | 4.66 | 0.04 | 511.38 | 1.14 | 1.00 | 1.07 | 0.54 | 1.00 |
| 25001 | 0.00 | 216.00 | 216.0 | 216.0 | 4.46 | 4.46 | 153.56 | 10.72 | 21.94 | 3.06 | 24.37 | 4.66 | 0.04 | 511.38 | 1.14 | 1.00 | 1.07 | 0.54 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/839 ) | 0.257 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=1,3)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 7.00 | 0.1875 | 0.1345 | 14.00 | 14.00 | 9.95 | 147.5 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 7.00 | 0.1875 | 0.1345 | 14.00 | 14.00 | 10.00 | 151.4 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 298.9 (p) (Includes all plates)
Frame Pricing Weight = 298.9 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 1,3 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO/FI | 4.67 | 3.00 |
| 1,3 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 1,3 | 1 | 1 | 0.00 | -4.95 | 0.00 | 4.95 | 0.0 | 1.03 | 0.36 | 0.45 | 0.21 | 0.54 | OK->ColumnWebRupture | 0.0955 | 0.0884 |
| 1,3 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 20/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 10.00 | 14.00 | 1 | 1 | 0.0 | -5.0 | -266.5 | 0.0 | 147.1 | 14.5 | 272.0 | 105.5 | 0.98 | 0.34 |
| 25001 | 0.00 | 14.00 | 1 | 1 | 0.0 | 4.1 | -266.5 | 0.0 | 147.1 | 14.5 | 272.0 | 105.5 | 0.98 | 0.29 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 10.00 | 240.00 | 240.0 | 240.0 | 4.46 | 4.46 | 153.56 | 10.72 | 21.94 | 3.06 | 24.37 | 4.66 | 0.04 | 511.38 | 1.13 | 1.00 | 1.07 | 0.54 | 1.00 |
| 25001 | 0.00 | 240.00 | 240.0 | 240.0 | 4.46 | 4.46 | 153.56 | 10.72 | 21.94 | 3.06 | 24.37 | 4.66 | 0.04 | 511.38 | 1.13 | 1.00 | 1.07 | 0.54 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

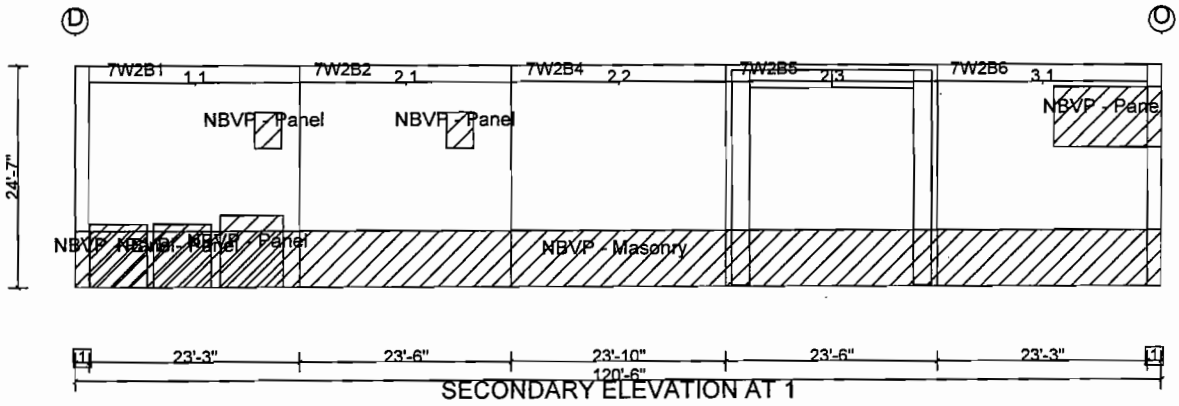
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,3)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/950 ) | 0.253 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2**




**Dimension Key**
1 1'-7"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.00 | 190.1 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.58 | 199.9 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 390.0 (p) (Includes all plates)
Frame Pricing Weight = 390.0 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FI | 4.25 | 0.25 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.63 | 1.13 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | 1 | 0.00 | -4.24 | 0.00 | 4.24 | 0.0 | 1.03 | 0.31 | 0.39 | 0.21 | 0.39 | OK->BearingAt: Beam Web | 0.0523 | 0.1875 |
| 1,1 | 2 | 1 | 0.00 | -4.10 | 0.00 | 4.10 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0506 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/3/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.62 | 9.00 | 1 | 1 | 0.0 | -4.2 | -287.2 | 0.0 | 169.7 | 21.4 | 302.3 | 159.5 | 0.95 | 0.20 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -287.2 | 0.0 | 169.7 | 21.4 | 302.3 | 159.5 | 0.95 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.62 | 279.00 | 279.0 | 279.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 279.00 | 279.0 | 279.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/413 ) | 0.674 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.2 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 404.4 (p) (Includes all plates)
Frame Pricing Weight = 404.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.13 |
| 2,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.69 | 1.13 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio | Description | Beam Web in. | Column in. |
| 2,1 | 1 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |
| 2,1 | 2 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.75 | 9.00 | 1 | 1 | 0.0 | -4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.75 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/404 ) | 0.698 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.87 | 205.2 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.86 | 205.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 410.3 (p) (Includes all plates)
Frame Pricing Weight = 410.3 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.13 |
| 2,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.69 | 1.13 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,2 | 1 | 1 | 0.00 | -4.19 | 0.00 | 4.19 | 0.0 | 1.03 | 0.31 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0516 | 0.0884 |
| 2,2 | 2 | 1 | 0.00 | -4.19 | 0.00 | 4.19 | 0.0 | 1.03 | 0.31 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0516 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/10/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.92 | 9.00 | 1 | 1 | 0.0 | -4.2 | -299.3 | 0.0 | 169.7 | 21.4 | 290.9 | 159.5 | 1.03 | 0.20 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.2 | -299.3 | 0.0 | 169.7 | 21.4 | 290.9 | 159.5 | 1.03 | 0.20 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.92 | 286.00 | 286.0 | 286.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 286.00 | 286.0 | 286.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/387 ) | 0.737 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,3)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.2 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 404.4 (p) (Includes all plates)
Frame Pricing Weight = 404.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,3 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.13 |
| 2,3 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.69 | 1.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 2,3 | 1 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |
| 2,3 | 2 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.23 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.75 | 9.00 | 1 | 1 | 0.0 | -4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.75 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,3)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/404 ) | 0.698 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=3,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 6.00 | 0.3750 | 0.1345 | 9.00 | 9.00 | 11.58 | 218.1 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 6.00 | 0.3750 | 0.1345 | 9.00 | 9.00 | 11.00 | 207.3 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 425.4 (p) (Includes all plates)
Frame Pricing Weight = 425.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 3,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.00 |
| 3,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FI | 4.25 | 0.38 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 3,1 | 1 | 1 | 0.00 | -4.10 | 0.00 | 4.10 | 0.0 | 1.03 | 0.30 | 0.38 | 0.23 | 0.47 | OK->ColumnWebRupture | 0.0505 | 0.0884 |
| 3,1 | 2 | 1 | 0.00 | -4.15 | 0.00 | 4.15 | 0.0 | 1.03 | 0.30 | 0.38 | 0.21 | 0.38 | OK->ClipLocalBuckling | 0.0511 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/3/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.63 | 9.00 | 1 | 1 | 0.0 | -4.1 | -286.1 | 0.0 | 185.1 | 22.1 | 278.2 | 224.0 | 1.03 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -286.1 | 0.0 | 185.1 | 22.1 | 278.2 | 224.0 | 1.03 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.63 | 279.00 | 279.0 | 279.0 | 5.61 | 5.61 | 90.04 | 13.50 | 20.01 | 4.50 | 21.69 | 6.79 | 0.22 | 251.10 | 1.14 | 1.00 | 1.08 | 1.00 | 1.00 |
| 25001 | 0.00 | 279.00 | 279.0 | 279.0 | 5.61 | 5.61 | 90.04 | 13.50 | 20.01 | 4.50 | 21.69 | 6.79 | 0.22 | 251.10 | 1.14 | 1.00 | 1.08 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

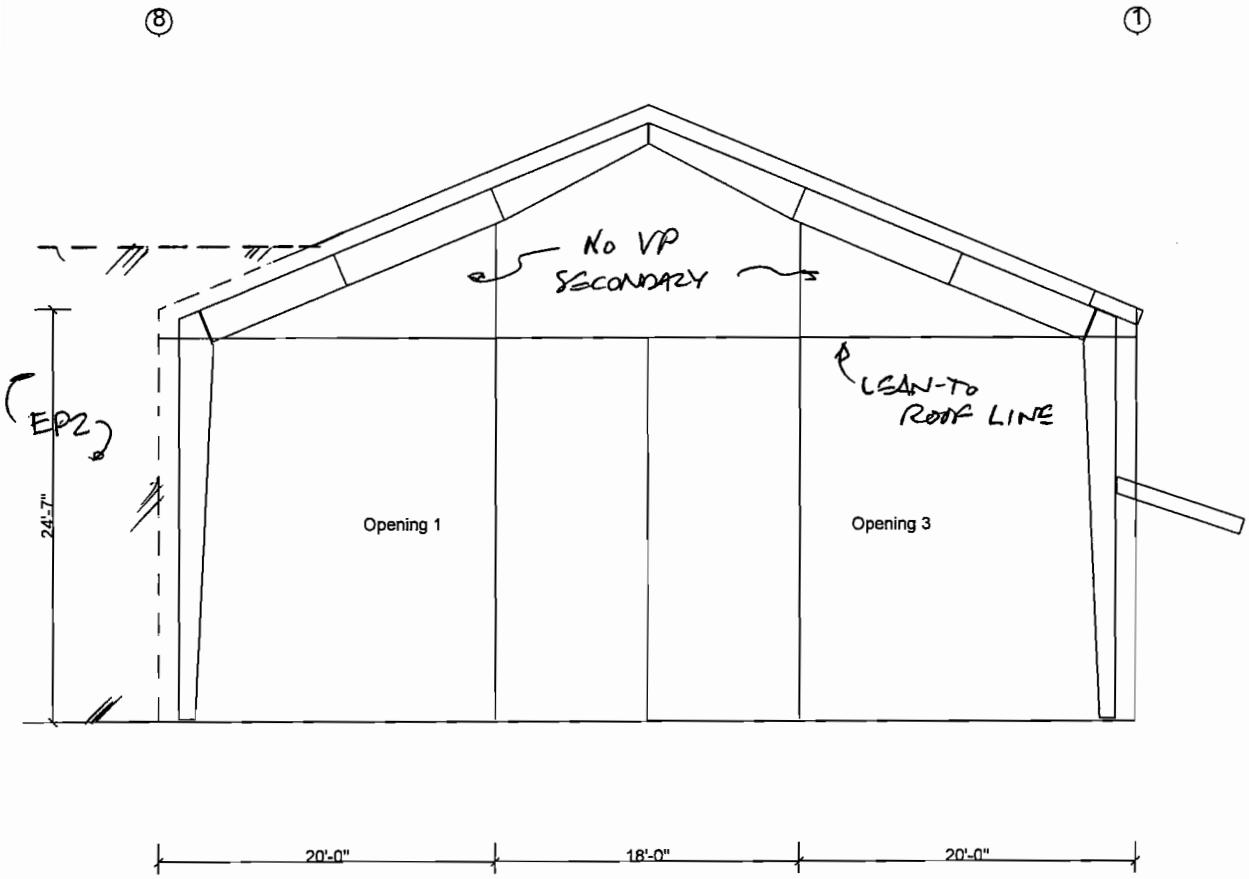
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=3,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/448 ) | 0.623 | 25001 | 1 | 1 | W1> |

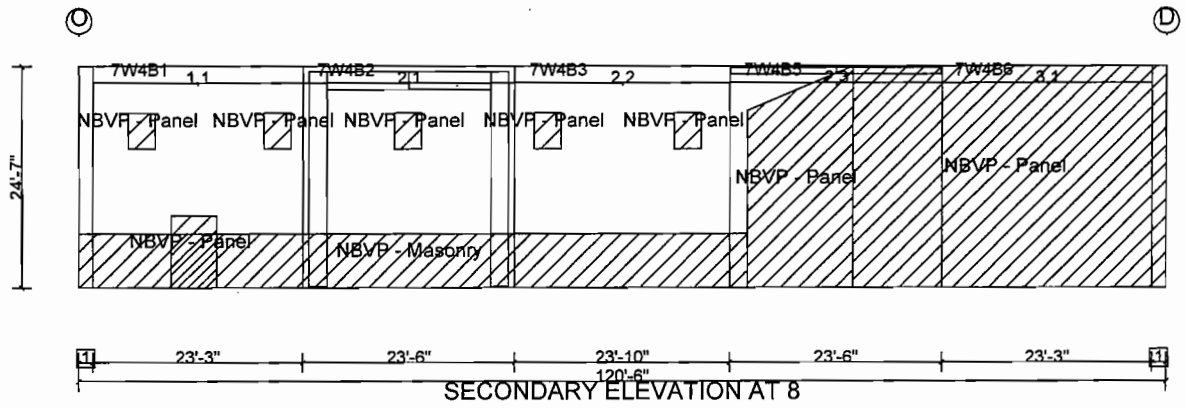
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 3**


⑧
①
No VP
SECONDARY
LEAN-TO
ROOF LINE
EP2
24'-7"
Opening 1
Opening 3
20'-0"
18'-0"
20'-0"

**Wall: 4**




SECONDARY ELEVATION AT 8

**Dimension Key**
1 1'-7"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 6.00 | 0.3750 | 0.1345 | 9.00 | 9.00 | 11.00 | 207.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 6.00 | 0.3750 | 0.1345 | 9.00 | 9.00 | 11.57 | 218.0 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 425.3 (p) (Includes all plates)
Frame Pricing Weight = 425.3 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FI | 4.25 | 0.38 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.69 | 1.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | 1 | 0.00 | -4.15 | 0.00 | 4.15 | 0.0 | 1.03 | 0.30 | 0.38 | 0.21 | 0.38 | OK->ClipLocalBuckling | 0.0511 | 0.1875 |
| 1,1 | 2 | 1 | 0.00 | -4.10 | 0.00 | 4.10 | 0.0 | 1.03 | 0.30 | 0.38 | 0.23 | 0.47 | OK->ColumnWebRupture | 0.0505 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/3/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.63 | 9.00 | 1 | 1 | 0.0 | -4.1 | -286.1 | 0.0 | 185.1 | 22.1 | 278.2 | 224.0 | 1.03 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -286.1 | 0.0 | 185.1 | 22.1 | 278.2 | 224.0 | 1.03 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.63 | 279.00 | 279.0 | 279.0 | 5.61 | 5.61 | 90.04 | 13.50 | 20.01 | 4.50 | 21.69 | 6.79 | 0.22 | 251.10 | 1.14 | 1.00 | 1.08 | 1.00 | 1.00 |
| 25001 | 0.00 | 279.00 | 279.0 | 279.0 | 5.61 | 5.61 | 90.04 | 13.50 | 20.01 | 4.50 | 21.69 | 6.79 | 0.22 | 251.10 | 1.14 | 1.00 | 1.08 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/448 ) | 0.623 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 404.4 (p) (Includes all plates)
Frame Pricing Weight = 404.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.00 |
| 2,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.63 | 1.12 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 2,1 | 1 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.23 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |
| 2,1 | 2 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.75 | 9.00 | 1 | 1 | 0.0 | -4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.75 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/404 ) | 0.698 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.87 | 205.2 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.87 | 205.0 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 410.2 (p) (Includes all plates)
Frame Pricing Weight = 410.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.12 |
| 2,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.63 | 1.12 |

| | | Required Strength | | | | | | Bolt Group | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,2 | 1 | 1 | 0.00 | -4.19 | 0.00 | 4.19 | 0.0 | 1.03 | 0.31 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0516 | 0.0884 |
| 2,2 | 2 | 1 | 0.00 | -4.19 | 0.00 | 4.19 | 0.0 | 1.03 | 0.31 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0516 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/10/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.92 | 9.00 | 1 | 1 | 0.0 | -4.2 | -299.3 | 0.0 | 169.7 | 21.4 | 290.9 | 159.5 | 1.03 | 0.20 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.2 | -299.3 | 0.0 | 169.7 | 21.4 | 290.9 | 159.5 | 1.03 | 0.20 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.92 | 286.00 | 286.0 | 286.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 286.00 | 286.0 | 286.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/387 ) | 0.737 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,3)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 11.70 | 202.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 404.4 (p) (Includes all plates)
Frame Pricing Weight = 404.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,3 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.12 |
| 2,3 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.63 | 1.12 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 2,3 | 1 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |
| 2,3 | 2 | 1 | 0.00 | -4.13 | 0.00 | 4.13 | 0.0 | 1.03 | 0.30 | 0.38 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0509 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.75 | 9.00 | 1 | 1 | 0.0 | -4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -291.3 | 0.0 | 169.7 | 21.4 | 297.5 | 159.5 | 0.98 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.75 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 282.00 | 282.0 | 282.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,3)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/404 ) | 0.698 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=3,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 6.00 | 0.3750 | 0.1345 | 9.00 | 9.00 | 11.58 | 218.1 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 6.00 | 0.3750 | 0.1345 | 9.00 | 9.00 | 11.00 | 207.3 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 425.4 (p) (Includes all plates)
Frame Pricing Weight = 425.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 3,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.66 | 1.12 |
| 3,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FI | 4.25 | 0.38 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 3,1 | 1 | 1 | 0.00 | -4.09 | 0.00 | 4.09 | 0.0 | 1.03 | 0.30 | 0.37 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0504 | 0.0884 |
| 3,1 | 2 | 1 | 0.00 | -4.09 | 0.00 | 4.09 | 0.0 | 1.03 | 0.30 | 0.37 | 0.21 | 0.38 | OK->ClipLocalBuckling | 0.0504 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/3/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.63 | 9.00 | 1 | 1 | 0.0 | -4.1 | -285.3 | 0.0 | 185.1 | 22.1 | 278.3 | 224.0 | 1.03 | 0.19 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 4.1 | -285.3 | 0.0 | 185.1 | 22.1 | 278.3 | 224.0 | 1.03 | 0.19 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.63 | 279.00 | 279.0 | 279.0 | 5.61 | 5.61 | 90.04 | 13.50 | 20.01 | 4.50 | 21.69 | 6.79 | 0.22 | 251.10 | 1.14 | 1.00 | 1.08 | 1.00 | 1.00 |
| 25001 | 0.00 | 279.00 | 279.0 | 279.0 | 5.61 | 5.61 | 90.04 | 13.50 | 20.01 | 4.50 | 21.69 | 6.79 | 0.22 | 251.10 | 1.14 | 1.00 | 1.08 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

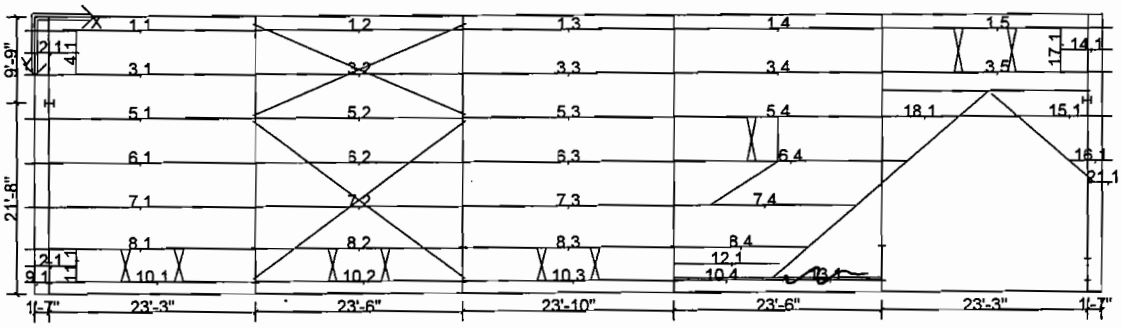
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=3,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/449 ) | 0.620 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Roof: A**




**Maximum Secondary Designs for Shape Operations Building on Side A**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.87 | 0.82 | 1.02 | 0.00 | 24 | 0.76 | 0.48 | 0.72 | 0.00 | 24 | 24 |
| 1,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.76 | 0.40 | 0.67 | 0.00 | 24 | 24 | 0.98 | 0.67 | 0.97 | 0.00 | 24 | 0.58 | 0.36 | 0.54 | 0.00 | 24 | 24 |
| 1,3 | 23.83 | 11.50x0.065 Z Con | Yes | 36 | 0.58 | 0.39 | 0.56 | 0.00 | 24 | 24 | 0.62 | 0.65 | 0.79 | 0.00 | 24 | 0.52 | 0.38 | 0.53 | 0.00 | 24 | 24 |
| 1,4 | 23.50 | 11.50x0.082 Z Con | Yes | 24 | 0.52 | 0.33 | 0.50 | 0.00 | 24 | 24 | 0.99 | 0.65 | 0.96 | 0.00 | 24 | 0.73 | 0.28 | 0.59 | 0.00 | 24 | 24 |
| 1,5 | 25.96 | 11.50x0.082 Z Con | Yes | 36 | 0.81 | 0.41 | 0.66 | 0.00 | 24 | 36 | 0.92 | 0.00 | 0.64 | 0.00 | 24 | | | | | | |
| 2,1 | 5.80 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.13 | 0.24 | 0.26 | 0.00 | 24 | | | | | | |
| 3,1 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.98 | 0.00 | 0.00 | 0.00 | 27 | 0.48 | 0.33 | 0.58 | 0.00 | 27 | 24 |
| 3,2 | 23.50 | 11.50x0.082 Z Con | Yes | 36 | 0.64 | 0.25 | 0.47 | 0.00 | 24 | 36 | 0.68 | 0.31 | 0.53 | 0.00 | 24 | 0.50 | 0.22 | 0.39 | 0.00 | 24 | 36 |
| 3,3 | 23.83 | 11.50x0.065 Z Con | Yes | 36 | 0.38 | 0.29 | 0.48 | 0.00 | 27 | 24 | 0.38 | 0.67 | 0.77 | 0.00 | 27 | 0.31 | 0.27 | 0.41 | 0.00 | 27 | 24 |
| 3,4 | 23.50 | 11.50x0.082 Z Con | Yes | 24 | 0.41 | 0.20 | 0.33 | 0.00 | 24 | 24 | 0.99 | 0.35 | 0.72 | 0.00 | 24 | 0.52 | 0.10 | 0.34 | 0.00 | 24 | 24 |
| 3,5 | 25.96 | 11.50x0.120 Z Con | Yes | 24 | 0.47 | 0.15 | 0.36 | 0.00 | 24 | 24 | 0.92 | 0.00 | 0.00 | 0.00 | 27 | | | | | | |
| 4,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.24 | 0.04 | 0.06 | 0.00 | 24 | | | | | | |
| 5,1 | 25.96 | 11.50x0.120 Z Con | Yes | 36 | | | | | | | 0.27 | 0.07 | 0.70 | 0.00 | 45 | 0.29 | 0.06 | 0.55 | 0.00 | 45 | 36 |
| 5,2 | 23.50 | 11.50x0.082 Z Con | Yes | 36 | 0.23 | 0.05 | 0.49 | 0.00 | 45 | 24 | 0.33 | 0.16 | 1.00 | 0.00 | 45 | 0.20 | 0.10 | 0.57 | 0.00 | 45 | 24 |
| 5,3 | 23.83 | 11.50x0.065 Z Con | Yes | 36 | 0.31 | 0.25 | 0.40 | 0.00 | 27 | 36 | 0.63 | 0.70 | 0.95 | 0.00 | 27 | 0.64 | 0.46 | 0.79 | 0.00 | 27 | 36 |
| 5,4 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.64 | 0.52 | 0.82 | 0.00 | 27 | 36 | 1.03 | 0.00 | 0.00 | 0.00 | 27 | | | | | | |
| 6,1 | 25.96 | 11.50x0.065 Z Con | Yes | 36 | | | | | | | 0.96 | 0.00 | 0.68 | 0.00 | 27 | 0.61 | 0.50 | 0.79 | 0.00 | 27 | 36 |
| 6,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.61 | 0.45 | 0.76 | 0.00 | 27 | 36 | 0.59 | 0.68 | 0.90 | 0.00 | 27 | 0.40 | 0.38 | 0.55 | 0.00 | 27 | 36 |
| 6,3 | 23.83 | 11.50x0.065 Z Con | Yes | 36 | 0.40 | 0.39 | 0.55 | 0.00 | 27 | 36 | 0.61 | 0.70 | 0.93 | 0.00 | 27 | 0.63 | 0.46 | 0.78 | 0.00 | 27 | 36 |
| 6,4 | 26.30 | 11.50x0.065 Z Con | Yes | 36 | 0.63 | 0.51 | 0.81 | 0.00 | 27 | 36 | 0.97 | 0.00 | 0.69 | 0.00 | 27 | | | | | | |
| 7,1 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.95 | 0.00 | 0.68 | 0.00 | 27 | 0.58 | 0.49 | 0.76 | 0.00 | 27 | 24 |
| 7,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.58 | 0.43 | 0.72 | 0.00 | 27 | 36 | 0.73 | 0.72 | 1.03 | 0.00 | 27 | 0.41 | 0.38 | 0.55 | 0.00 | 27 | 36 |
| 7,3 | 23.83 | 11.50x0.065 Z Con | Yes | 36 | 0.41 | 0.39 | 0.57 | 0.00 | 27 | 24 | 0.64 | 0.72 | 0.96 | 0.00 | 27 | 0.53 | 0.43 | 0.68 | 0.00 | 27 | 24 |
| 7,4 | 20.53 | 11.50x0.065 Z Con | Yes | 24 | 0.53 | 0.46 | 0.70 | 0.00 | 27 | 24 | 0.60 | 0.78 | 0.98 | 0.00 | 27 | | | | | | |
| 8,1 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.56 | 0.73 | 0.92 | 0.00 | 27 | 0.49 | 0.43 | 0.65 | 0.00 | 27 | 24 |
| 8,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.49 | 0.37 | 0.62 | 0.00 | 27 | 24 | 0.62 | 0.62 | 0.88 | 0.00 | 27 | 0.39 | 0.34 | 0.52 | 0.00 | 27 | 24 |
| 8,3 | 23.83 | 11.50x0.065 Z Con | Yes | 36 | 0.39 | 0.37 | 0.54 | 0.00 | 27 | 24 | 0.42 | 0.61 | 0.74 | 0.00 | 27 | 0.34 | 0.35 | 0.49 | 0.00 | 27 | 24 |
| 8,4 | 15.07 | 11.50x0.065 Z Con | Yes | 24 | 0.34 | 0.27 | 0.44 | 0.00 | 27 | 24 | 0.42 | 0.45 | 0.61 | 0.00 | 27 | | | | | | |
| 9,1 | 2.71 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.02 | 0.00 | 24 | | | | | | |
| 10,1 | 23.25 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.90 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 10,2 | 23.50 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.85 | 0.00 | 0.56 | 0.00 | 24 | | | | | | |
| 10,3 | 23.83 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.88 | 0.00 | 0.58 | 0.00 | 24 | | | | | | |
| 10,4 | 10.72 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.36 | 0.00 | 0.24 | 0.00 | 24 | | | | | | |
| 11,1 | 3.77 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.14 | 0.03 | 0.04 | 0.00 | 24 | | | | | | |
| 12,1 | 11.95 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.00 | 0.19 | 0.00 | 0.36 | 27 | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~13,1~~ | ~~12.78~~ | ~~11.50x0.065 Z Sim~~ | ~~Yes~~ | ~~0~~ | | | | | | | ~~0.69~~ | ~~0.01~~ | ~~0.46~~ | ~~0.00~~ | ~~24~~ | | | | | | |
| 14,1 | 5.80 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.13 | 0.24 | 0.26 | 0.00 | 24 | | | | | | |
| 15,1 | 10.67 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.00 | 0.34 | 0.00 | 0.82 | 27 | | | | | | |
| 16,1 | 4.86 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.00 | 0.32 | 0.00 | 0.60 | 27 | | | | | | |
| 17,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.39 | 0.06 | 0.09 | 0.00 | 24 | | | | | | |
| 18,1 | 8.57 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.52 | 0.01 | 0.37 | 0.00 | 27 | | | | | | |
| ~~19,1~~ | ~~5.00~~ | ~~8.50x0.059 C Sim~~ | ~~Yes~~ | ~~0~~ | | | | | | | | | | | | | | | | | |
| ~~20,1~~ | ~~3.77~~ | ~~8.50x0.059 C Sim~~ | ~~Yes~~ | ~~0~~ | | | | | | | | | | | | | | | | | |
| 21,1 | 1.96 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.01 | 0.02 | 0.00 | 24 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building on Side A**

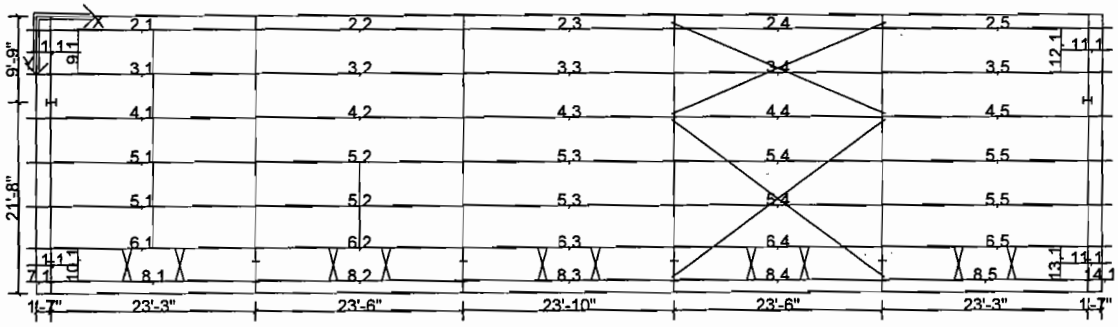
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.45 | ( L/615 ) | 12.71 | 1 | W1> |
| 1 | 2 | -0.05 | ( L/5468 ) | 38.46 | 9 | L |
| 1 | 3 | 0.25 | ( L/1161 ) | 61.46 | 1 | W1> |
| 1 | 4 | -0.08 | ( L/3668 ) | 92.29 | 1 | W1> |
| 1 | 5 | 0.52 | ( L/541 ) | 109.79 | 1 | W1> |
| 2 | 1 | - | - | - | - | - |
| 3 | 1 | 0.39 | ( L/716 ) | 12.71 | 1 | W1> |
| 3 | 2 | -0.04 | ( L/7594 ) | 29.46 | 1 | W1> |
| 3 | 3 | 0.23 | ( L/1218 ) | 61.46 | 1 | W1> |
| 3 | 4 | 0.12 | ( L/2439 ) | 90.79 | 9 | L |
| 3 | 5 | -0.53 | ( L/529 ) | 109.29 | 9 | L |
| 4 | 1 | - | - | - | - | - |
| 5 | 1 | -0.20 | ( L/1392 ) | 12.71 | 9 | L |
| 5 | 2 | -0.08 | ( L/3579 ) | 38.96 | 9 | L |
| 5 | 3 | -0.09 | ( L/3309 ) | 59.96 | 9 | L |
| 5 | 4 | -0.40 | ( L/704 ) | 86.79 | 9 | L |
| 6 | 1 | -0.36 | ( L/769 ) | 12.71 | 9 | L |
| 6 | 2 | -0.08 | ( L/3483 ) | 38.96 | 9 | L |
| 6 | 3 | -0.09 | ( L/3053 ) | 59.96 | 9 | L |
| 6 | 4 | -0.38 | ( L/742 ) | 86.79 | 9 | L |
| 7 | 1 | -0.37 | ( L/761 ) | 12.71 | 9 | L |
| 7 | 2 | -0.07 | ( L/4088 ) | 38.96 | 9 | L |
| 7 | 3 | -0.14 | ( L/2059 ) | 60.46 | 9 | L |
| 7 | 4 | -0.23 | ( L/1062 ) | 85.29 | 9 | L |
| 8 | 1 | 0.34 | ( L/823 ) | 12.71 | 1 | W1> |
| 8 | 2 | 0.05 | ( L/6093 ) | 38.46 | 1 | W1> |
| 8 | 3 | -0.20 | ( L/1440 ) | 61.46 | 9 | L |
| 8 | 4 | 0.00 | ( L/7709 ) | 76.79 | 9 | L |
| 9 | 1 | - | - | - | - | - |
| 10 | 1 | 0.60 | ( L/465 ) | 11.50 | 1 | W1> |
| 10 | 2 | 0.58 | ( L/483 ) | 35.25 | 1 | W1> |
| 10 | 3 | 0.62 | ( L/463 ) | 58.75 | 1 | W1> |
| 10 | 4 | 0.04 | ( L/3057 ) | 76.08 | 1 | W1> |
| 11 | 1 | - | - | - | - | - |
| 12 | 1 | 0.05 | ( L/2761 ) | 6.00 | 1 | W1> |
| 13 | 1 | 0.12 | ( L/1331 ) | 6.50 | 1 | W1> |
| 14 | 1 | - | - | - | - | - |
| 15 | 1 | 0.00 | ( L/3814 ) | 4.00 | 1 | W1> |
| 16 | 1 | - | - | - | - | - |
| 17 | 1 | - | - | - | - | - |
| 18 | 1 | -0.04 | ( L/2883 ) | 4.50 | 9 | L |
| 19 | 1 | - | - | - | - | - |
| 20 | 1 | - | - | - | - | - |
| 21 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Operations Building, Roof A, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.065 | -15.39 | 1 | 8 | 25.96 | N | 31.42 | 0.865 | 0.000 |
| 2 | 0.065 | -13.91 | 1 | 7 | 23.50 | N | 31.42 | 0.783 | 0.000 |
| 3 | 0.065 | -14.11 | 1 | 7 | 23.83 | N | 31.42 | 0.794 | 0.000 |
| 4 | 0.065 | -14.57 | 1 | 8 | 26.30 | N | 31.42 | 0.877 | 0.000 |
| 5 | 0.082 | -8.32 | 1 | 4 | 25.96 | N | 31.42 | 0.865 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.89 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 1.23 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 1.16 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 1.13 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 0.97 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Roof: B




**Maximum Secondary Designs for Shape Operations Building on Side B**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 5.80 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.13 | 0.24 | 0.26 | 0.00 | 24 | | | | | | |
| 2,1 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.87 | 0.82 | 1.02 | 0.00 | 24 | 0.76 | 0.48 | 0.72 | 0.00 | 24 | 24 |
| 2,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.76 | 0.40 | 0.67 | 0.00 | 24 | 24 | 0.98 | 0.67 | 0.97 | 0.00 | 24 | 0.58 | 0.36 | 0.54 | 0.00 | 24 | 24 |
| 2,3 | 23.83 | 11.50x0.065 Z Con | Yes | 24 | 0.58 | 0.39 | 0.56 | 0.00 | 24 | 24 | 0.62 | 0.65 | 0.79 | 0.00 | 24 | 0.52 | 0.38 | 0.53 | 0.00 | 24 | 24 |
| 2,4 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.52 | 0.33 | 0.50 | 0.00 | 24 | 24 | 0.99 | 0.65 | 0.96 | 0.00 | 24 | 0.73 | 0.28 | 0.59 | 0.00 | 24 | 24 |
| 2,5 | 25.96 | 11.50x0.082 Z Con | Yes | 36 | 0.81 | 0.41 | 0.66 | 0.00 | 24 | 36 | 0.92 | 0.00 | 0.64 | 0.00 | 24 | | | | | | |
| 3,1 | 25.96 | 11.50x0.065 Z Con | Yes | 36 | | | | | | | 0.98 | 0.00 | 0.70 | 0.00 | 27 | 0.60 | 0.50 | 0.78 | 0.00 | 27 | 36 |
| 3,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.60 | 0.44 | 0.74 | 0.00 | 27 | 36 | 0.58 | 0.66 | 0.88 | 0.00 | 27 | 0.45 | 0.39 | 0.60 | 0.00 | 27 | 36 |
| 3,3 | 23.83 | 11.50x0.065 Z Con | Yes | 24 | 0.45 | 0.42 | 0.62 | 0.00 | 27 | 24 | 0.46 | 0.69 | 0.83 | 0.00 | 27 | 0.43 | 0.42 | 0.60 | 0.00 | 27 | 24 |
| 3,4 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.43 | 0.38 | 0.58 | 0.00 | 27 | 24 | 0.62 | 0.68 | 0.92 | 0.00 | 27 | 0.63 | 0.26 | 0.52 | 0.00 | 24 | 24 |
| 3,5 | 25.96 | 11.50x0.082 Z Con | Yes | 36 | 0.70 | 0.34 | 0.56 | 0.00 | 24 | 36 | 0.85 | 0.00 | 0.55 | 0.00 | 27 | | | | | | |
| 4,1 | 25.96 | 11.50x0.082 Z Con | Yes | 24 | | | | | | | 0.47 | 0.00 | 0.80 | 0.00 | 49 | 0.45 | 0.33 | 0.56 | 0.00 | 27 | 24 |
| 4,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.45 | 0.29 | 0.54 | 0.00 | 27 | 24 | 0.71 | 0.73 | 1.02 | 0.00 | 27 | 0.44 | 0.39 | 0.59 | 0.00 | 27 | 24 |
| 4,3 | 23.83 | 11.50x0.065 Z Con | Yes | 24 | 0.44 | 0.42 | 0.61 | 0.00 | 27 | 24 | 0.52 | 0.71 | 0.88 | 0.00 | 27 | 0.15 | 0.05 | 0.29 | 0.00 | 49 | 24 |
| 4,4 | 23.50 | 11.50x0.120 Z Con | Yes | 36 | 0.22 | 0.04 | 0.50 | 0.00 | 45 | 24 | 0.31 | 0.05 | 0.74 | 0.00 | 45 | 0.23 | 0.03 | 0.44 | 0.00 | 45 | 24 |
| 4,5 | 25.96 | 11.50x0.120 Z Con | Yes | 24 | 0.23 | 0.04 | 0.44 | 0.00 | 45 | 24 | 0.27 | 0.00 | 0.70 | 0.00 | 45 | | | | | | |
| 5,1 | 25.96 | 11.50x0.065 Z Con | Yes | 36 | | | | | | | 0.98 | 0.00 | 0.69 | 0.00 | 27 | 0.60 | 0.50 | 0.78 | 0.00 | 27 | 36 |
| 5,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.60 | 0.44 | 0.74 | 0.00 | 27 | 36 | 0.58 | 0.66 | 0.88 | 0.00 | 27 | 0.45 | 0.39 | 0.59 | 0.00 | 27 | 36 |
| 5,3 | 23.83 | 11.50x0.065 Z Con | Yes | 24 | 0.45 | 0.42 | 0.61 | 0.00 | 27 | 24 | 0.31 | 0.63 | 0.70 | 0.00 | 27 | 0.45 | 0.42 | 0.61 | 0.00 | 27 | 24 |
| 5,4 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.45 | 0.39 | 0.59 | 0.00 | 27 | 36 | 0.58 | 0.66 | 0.88 | 0.00 | 27 | 0.60 | 0.44 | 0.74 | 0.00 | 27 | 36 |
| 5,5 | 25.96 | 11.50x0.065 Z Con | Yes | 36 | 0.60 | 0.50 | 0.78 | 0.00 | 27 | 36 | 0.98 | 0.00 | 0.69 | 0.00 | 27 | | | | | | |
| 6,1 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.57 | 0.73 | 0.92 | 0.00 | 27 | 0.49 | 0.43 | 0.65 | 0.00 | 27 | 24 |
| 6,2 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.49 | 0.37 | 0.62 | 0.00 | 27 | 24 | 0.62 | 0.62 | 0.88 | 0.00 | 27 | 0.38 | 0.34 | 0.51 | 0.00 | 27 | 24 |
| 6,3 | 23.83 | 11.50x0.065 Z Con | Yes | 24 | 0.38 | 0.36 | 0.53 | 0.00 | 27 | 24 | 0.41 | 0.60 | 0.73 | 0.00 | 27 | 0.37 | 0.36 | 0.51 | 0.00 | 27 | 24 |
| 6,4 | 23.50 | 11.50x0.065 Z Con | Yes | 36 | 0.37 | 0.33 | 0.49 | 0.00 | 27 | 24 | 0.69 | 0.64 | 0.94 | 0.00 | 27 | 0.67 | 0.32 | 0.58 | 0.00 | 24 | 24 |
| 6,5 | 25.96 | 11.50x0.065 Z Con | Yes | 24 | 0.53 | 0.48 | 0.71 | 0.00 | 27 | 24 | 0.60 | 0.81 | 1.01 | 0.00 | 27 | | | | | | |
| 7,1 | 2.71 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.02 | 0.00 | 24 | | | | | | |
| 8,1 | 23.25 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.90 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 8,2 | 23.50 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.86 | 0.00 | 0.56 | 0.00 | 24 | | | | | | |
| 8,3 | 23.83 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.88 | 0.00 | 0.58 | 0.00 | 24 | | | | | | |
| 8,4 | 23.50 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.86 | 0.00 | 0.56 | 0.00 | 24 | | | | | | |
| 8,5 | 23.25 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.91 | 0.00 | 0.60 | 0.00 | 24 | | | | | | |
| 9,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.24 | 0.04 | 0.06 | 0.00 | 24 | | | | | | |
| 10,1 | 3.77 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.14 | 0.03 | 0.04 | 0.00 | 24 | | | | | | |
| 11,1 | 5.80 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.13 | 0.24 | 0.26 | 0.00 | 24 | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.39 | 0.06 | 0.09 | 0.00 | 24 | | | | | | |
| 13,1 | 3.77 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.22 | 0.05 | 0.06 | 0.00 | 24 | | | | | | |
| 14,1 | 2.71 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.01 | 0.02 | 0.00 | 24 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building on Side B**

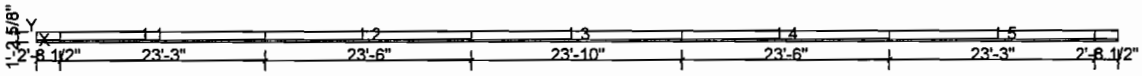
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | - | - | - | - | - |
| 2 | 1 | 0.45 | ( L/615 ) | 12.71 | 1 | W1> |
| 2 | 2 | -0.05 | ( L/5468 ) | 38.46 | 9 | L |
| 2 | 3 | 0.25 | ( L/1161 ) | 61.46 | 1 | W1> |
| 2 | 4 | -0.08 | ( L/3668 ) | 92.29 | 1 | W1> |
| 2 | 5 | 0.52 | ( L/541 ) | 109.79 | 1 | W1> |
| 3 | 1 | 0.39 | ( L/716 ) | 12.71 | 1 | W1> |
| 3 | 2 | -0.05 | ( L/6171 ) | 38.96 | 9 | L |
| 3 | 3 | 0.22 | ( L/1296 ) | 61.46 | 1 | W1> |
| 3 | 4 | -0.06 | ( L/4565 ) | 84.29 | 9 | L |
| 3 | 5 | 0.42 | ( L/668 ) | 109.79 | 1 | W1> |
| 4 | 1 | -0.31 | ( L/906 ) | 12.71 | 9 | L |
| 4 | 2 | -0.07 | ( L/3856 ) | 38.46 | 9 | L |
| 4 | 3 | -0.19 | ( L/1523 ) | 61.46 | 9 | L |
| 4 | 4 | - | - | - | - | - |
| 4 | 5 | -0.21 | ( L/1317 ) | 109.79 | 9 | L |
| 5 | 1 | -0.37 | ( L/745 ) | 12.71 | 9 | L |
| 5 | 2 | -0.05 | ( L/6010 ) | 38.46 | 9 | L |
| 5 | 3 | -0.20 | ( L/1402 ) | 61.46 | 9 | L |
| 5 | 4 | -0.05 | ( L/6058 ) | 84.29 | 9 | L |
| 5 | 5 | -0.38 | ( L/740 ) | 109.79 | 9 | L |
| 6 | 1 | 0.34 | ( L/823 ) | 12.71 | 1 | W1> |
| 6 | 2 | -0.05 | ( L/5540 ) | 38.46 | 9 | L |
| 6 | 3 | 0.19 | ( L/1526 ) | 61.46 | 1 | W1> |
| 6 | 4 | -0.05 | ( L/5352 ) | 92.79 | 1 | W1> |
| 6 | 5 | 0.45 | ( L/625 ) | 109.79 | 1 | W1> |
| 7 | 1 | - | - | - | - | - |
| 8 | 1 | 0.60 | ( L/464 ) | 11.50 | 1 | W1> |
| 8 | 2 | 0.58 | ( L/483 ) | 34.75 | 1 | W1> |
| 8 | 3 | 0.62 | ( L/463 ) | 58.75 | 1 | W1> |
| 8 | 4 | 0.58 | ( L/483 ) | 82.58 | 1 | W1> |
| 8 | 5 | 0.61 | ( L/459 ) | 105.58 | 1 | W1> |
| 9 | 1 | - | - | - | - | - |
| 10 | 1 | - | - | - | - | - |
| 11 | 1 | - | - | - | - | - |
| 12 | 1 | - | - | - | - | - |
| 13 | 1 | - | - | - | - | - |
| 14 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Operations Building, Roof B, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.065 | -0.48 | 1 | 0 | 5.80 | Y | 31.42 | 0.193 | 0.000 |
| 2 | 0.065 | -14.90 | 1 | 8 | 25.96 | N | 31.42 | 0.865 | 0.000 |
| 3 | 0.059 | 0.00 | 0 | 0 | 5.00 | Y | 0.00 | 0.167 | ~~1.#QO~~ |
| 4 | 0.065 | -13.90 | 1 | 7 | 23.50 | N | 31.42 | 0.783 | 0.000 |
| 5 | 0.065 | -14.09 | 1 | 7 | 23.83 | N | 31.42 | 0.794 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 1.18 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 1.10 | 1.14 | 1 | 1 | 0.017 | ~~1.#IO*~~ | 1.#IO~~~ |
| 4 | 1.15 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 1.16 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Wall: 2 - Canopy 1




**Maximum Secondary Designs for Shape Operations Building on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 25.96 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.88 | 0.00 | 0.41 | 0.00 | 24 | | | | | | |
| 1,2 | 23.50 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.92 | 0.00 | 0.43 | 0.00 | 24 | | | | | | |
| 1,3 | 23.83 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.44 | 0.00 | 24 | | | | | | |
| 1,4 | 23.50 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.92 | 0.00 | 0.43 | 0.00 | 24 | | | | | | |
| 1,5 | 25.96 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.88 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building on Side 2**

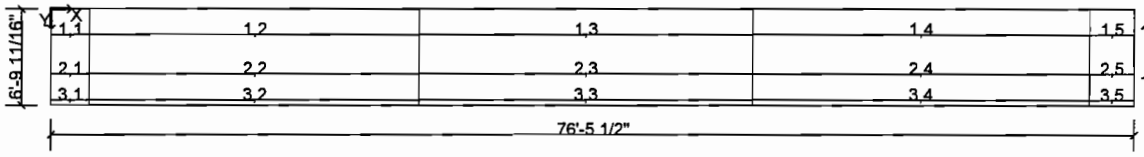
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.36 | ( L/772 ) | 14.21 | 1 | W1> |
| 1 | 2 | 0.39 | ( L/725 ) | 37.46 | 1 | W1> |
| 1 | 3 | 0.41 | ( L/694 ) | 61.46 | 1 | W1> |
| 1 | 4 | 0.39 | ( L/725 ) | 84.79 | 1 | W1> |
| 1 | 5 | 0.36 | ( L/772 ) | 108.29 | 1 | W1> |

**Purlin Anchorage Forces for Shape Operations Building, Roof Wall: 2 - Canopy 1, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|

## Wall: 2 - Canopy 2




**Maximum Secondary Designs for Shape Operations Building on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 2.71 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.08 | 0.00 | 0.04 | 0.00 | 24 | | | | | | |
| 1,2 | 23.25 | 11.50x0.120 Z Sim | No | 0 | | | | | | | 1.34 | 0.00 | 0.63 | 0.00 | 24 | | | | | | |
| 1,3 | 23.50 | 11.50x0.120 Z Sim | No | *0 | | | | | | * | 1.36 | 0.00 | 0.64 | 0.00 | 24 | | | | | | |
| 1,4 | 23.83 | 11.50x0.120 Z Sim | No | 0 | | | | | | | 1.40 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 1,5 | 3.17 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.11 | 0.01 | 0.05 | 0.00 | 24 | | | | | | |
| 2,1 | 2.71 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.05 | 0.00 | 0.02 | 0.00 | 24 | | | | | | |
| 2,2 | 23.25 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 2,3 | 23.50 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 2,4 | 23.83 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.84 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 2,5 | 3.17 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.07 | 0.01 | 0.03 | 0.00 | 24 | | | | | | |
| 3,1 | 2.71 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.01 | 0.00 | 24 | | | | | | |
| 3,2 | 23.25 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.78 | 0.00 | 0.37 | 0.00 | 24 | | | | | | |
| 3,3 | 23.50 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.37 | 0.00 | 24 | | | | | | |
| 3,4 | 23.83 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.82 | 0.00 | 0.00 | 0.00 | 24 | | | | | | |
| 3,5 | 3.17 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.00 | 0.02 | 0.00 | 24 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building on Side 2**

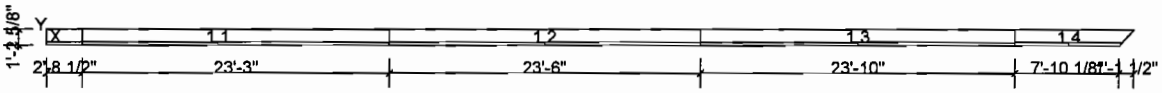
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | - | - | - | - | - |
| 1 | 2 | 0.74 | ( L/375 ) | 14.21 | 1 | W1> |
| 1 | 3 | 0.77 | ( L/365 ) | 37.96 | 1 | W1> |
| 1 | 4 | 0.82 | ( L/349 ) | 61.46 | 1 | W1> |
| 1 | 5 | - | - | - | - | - |
| 2 | 1 | - | - | - | - | - |
| 2 | 2 | 0.45 | ( L/618 ) | 14.21 | 1 | W1> |
| 2 | 3 | 0.47 | ( L/602 ) | 37.96 | 1 | W1> |
| 2 | 4 | 0.50 | ( L/575 ) | 61.46 | 1 | W1> |
| 2 | 5 | - | - | - | - | - |
| 3 | 1 | - | - | - | - | - |
| 3 | 2 | 0.38 | ( L/733 ) | 14.21 | 1 | W1> |
| 3 | 3 | 0.39 | ( L/714 ) | 37.96 | 1 | W1> |
| 3 | 4 | 0.42 | ( L/681 ) | 61.46 | 1 | W1> |
| 3 | 5 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Operations Building, Roof Wall: 2 - Canopy 2, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

## Wall: 4 - Canopy 1




**Maximum Secondary Designs for Shape Operations Building on Side 4**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 25.96 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.88 | 0.00 | 0.41 | 0.00 | 24 | | | | | | |
| 1,2 | 23.50 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.92 | 0.00 | 0.43 | 0.00 | 24 | | | | | | |
| 1,3 | 23.83 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.94 | 0.00 | 0.44 | 0.00 | 24 | | | | | | |
| 1,4 | 8.07 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.13 | 0.00 | 0.06 | 0.00 | 24 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building on Side 4**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.36 | ( L/766 ) | 14.21 | 1 | W1> |
| 1 | 2 | 0.39 | ( L/725 ) | 37.96 | 1 | W1> |
| 1 | 3 | 0.41 | ( L/697 ) | 61.46 | 1 | W1> |
| 1 | 4 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Operations Building, Roof Wall: 4 - Canopy 1, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|

## Loads and Codes - Shape: Operations Building Lean-to

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 5) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 5) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 20 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 21 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 23 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |

| | | | | |
|---|---|---|---|---|
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |
| 4 | System | 1.000 | 0.700 E> | E> |
| 5 | System | 1.000 | 0.700 <E | <E |

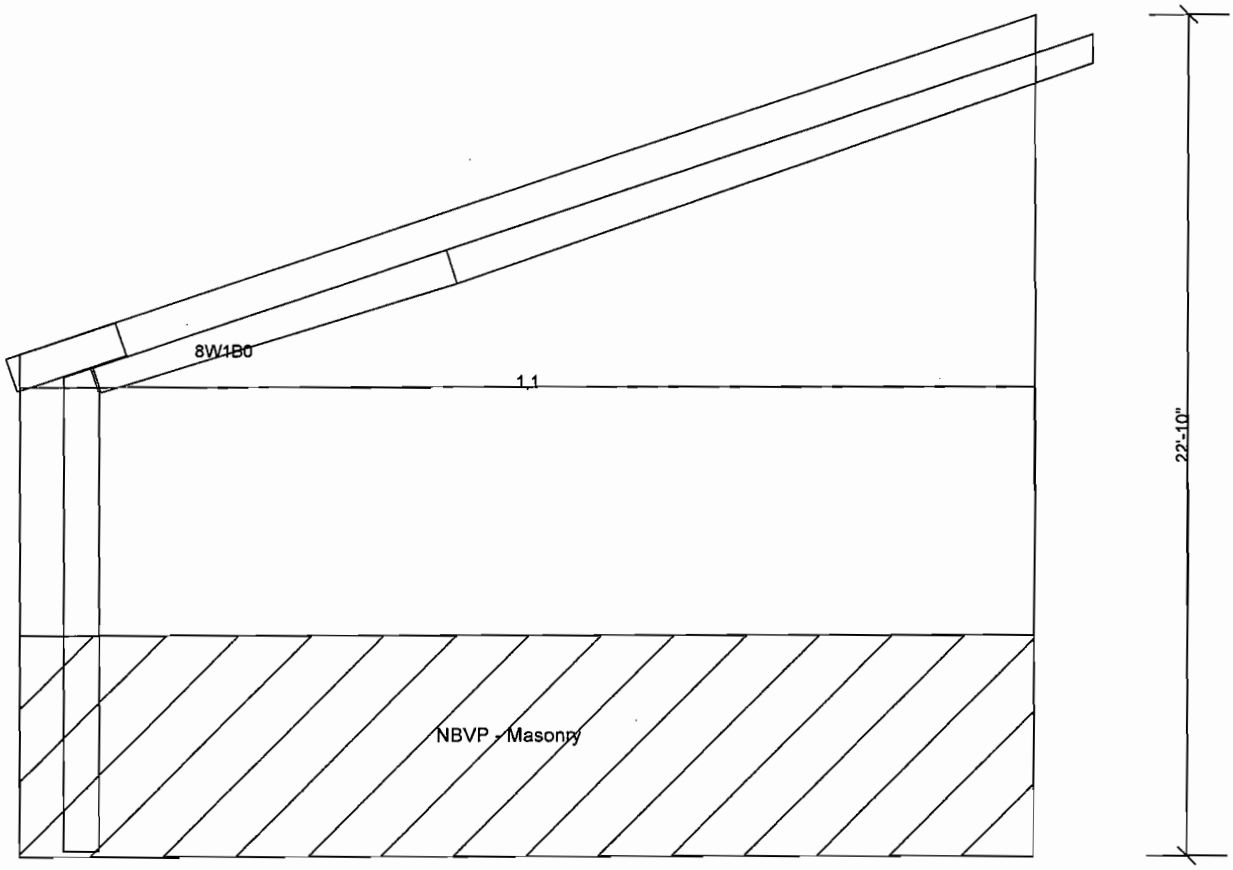
**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 S + 1.0 SD | S + SD |
| 6 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 0.500 <E | <E |

**Wall: 1**



**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 18.00 | 18.00 | 13.75 | 296.8 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 18.00 | 18.00 | 13.75 | 312.8 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 609.6 (p) (Includes all plates)
Frame Pricing Weight = 610.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 1,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 1,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 27/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 13.75 | 18.00 | 1 | 1 | 0.0 | -4.0 | -383.7 | 0.0 | 209.7 | 11.3 | 378.0 | 250.2 | 1.02 | 0.35 |
| 25001 | 2.29 | 18.00 | 1 | 1 | 0.0 | 5.6 | -385.1 | 0.0 | 209.7 | 11.3 | 378.0 | 250.2 | 1.02 | 0.49 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 13.75 | 330.00 | 330.0 | 330.0 | 6.35 | 6.35 | 375.15 | 21.34 | 41.68 | 5.33 | 45.80 | 8.08 | 0.10 | 1680.61 | 1.13 | 1.00 | 1.00 | 0.65 | 1.00 |
| 25001 | 2.29 | 330.00 | 330.0 | 330.0 | 6.35 | 6.35 | 375.15 | 21.34 | 41.68 | 5.33 | 45.80 | 8.08 | 0.10 | 1680.61 | 1.13 | 1.00 | 1.00 | 0.65 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

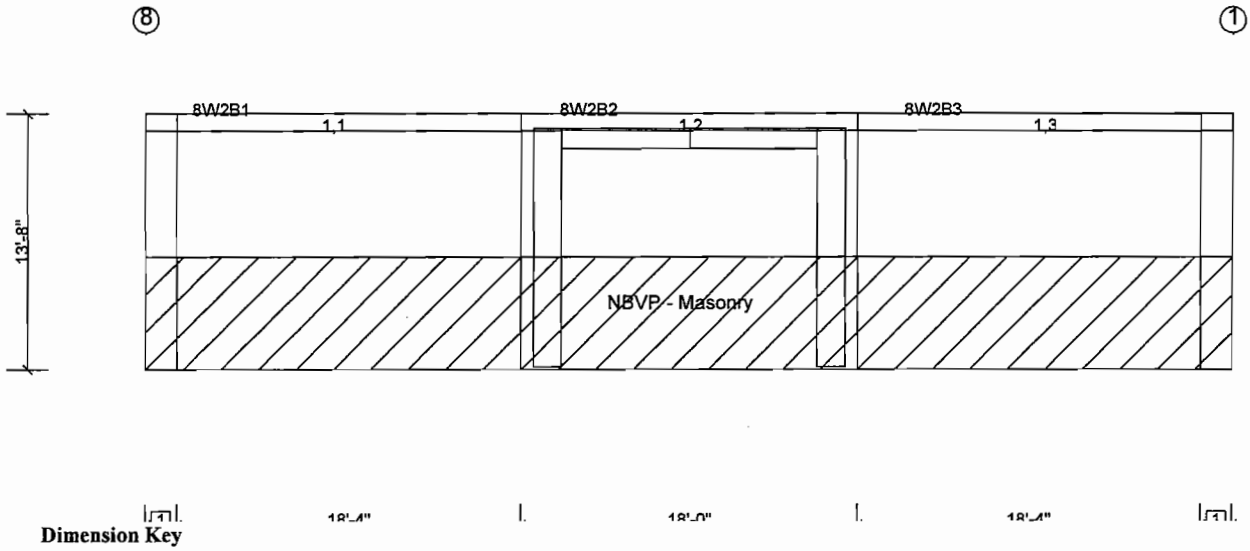
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1173 ) | 0.281 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2**




**Dimension Key**
1 1'-8"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 1.67 | 16.6 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 9.17 | 107.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25002 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 9.13 | 106.8 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 230.6 (p) (Includes all plates)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 99.00 | RemoveInsetBeamCantilever | 0.0000 | 0.0000 |
| 1,1 | 2 | 1 | 0.00 | -1.86 | 0.00 | 1.86 | 0.0 | 1.03 | 0.14 | 0.17 | 0.06 | 0.66 | OK->ColumnWebRupture | 0.0229 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/8/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25002 | 20/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.67 | 12.00 | 1 | 1 | 0.0 | 0.4 | 3.7 | 0.0 | 96.5 | 16.7 | 70.7 | 39.0 | 0.05 | 0.02 |
| 25001 | 9.17 | 12.00 | 1 | 1 | 0.0 | -2.0 | -101.8 | 0.0 | 113.5 | 17.0 | 102.2 | 55.4 | 1.00 | 0.11 |
| 25002 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.9 | -101.8 | 0.0 | 113.5 | 17.0 | 102.2 | 55.4 | 1.00 | 0.11 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.67 | 240.00 | 240.0 | 240.0 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.20 | 1.00 | 1.15 | 0.59 | 1.00 |
| 25001 | 9.17 | 240.00 | 240.0 | 240.0 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.20 | 1.00 | 1.13 | 0.84 | 1.00 |
| 25002 | 0.00 | 240.00 | 240.0 | 240.0 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.20 | 1.00 | 1.13 | 0.84 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1611 ) | 0.149 | 25002 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=1,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1875 | 0.1345 | 10.00 | 10.00 | 8.96 | 96.6 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1875 | 0.1345 | 10.00 | 10.00 | 8.96 | 96.6 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 193.2 (p) (Includes all plates)
Frame Pricing Weight = 193.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |
| 1,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,2 | 1 | 1 | 0.00 | -1.85 | 0.00 | 1.85 | 0.0 | 1.03 | 0.14 | 0.17 | 0.08 | 0.66 | OK->ColumnWebRupture | 0.0228 | 0.0884 |
| 1,2 | 2 | 1 | 0.00 | -1.85 | 0.00 | 1.85 | 0.0 | 1.03 | 0.14 | 0.17 | 0.08 | 0.66 | OK->ColumnWebRupture | 0.0228 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.00 | 10.00 | 1 | 1 | 0.0 | -1.8 | -99.7 | 0.0 | 104.6 | 20.7 | 100.8 | 57.4 | 0.99 | 0.09 |
| 25001 | 0.00 | 10.00 | 1 | 1 | 0.0 | 1.8 | -99.7 | 0.0 | 104.6 | 20.7 | 100.8 | 57.4 | 0.99 | 0.09 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.00 | 216.00 | 216.0 | 216.0 | 3.17 | 3.17 | 55.13 | 3.91 | 11.03 | 1.56 | 12.31 | 2.39 | 0.03 | 94.08 | 1.14 | 1.00 | 1.12 | 0.87 | 1.00 |
| 25001 | 0.00 | 216.00 | 216.0 | 216.0 | 3.17 | 3.17 | 55.13 | 3.91 | 11.03 | 1.56 | 12.31 | 2.39 | 0.03 | 94.08 | 1.14 | 1.00 | 1.12 | 0.87 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1018 ) | 0.212 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=1,3)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 9.13 | 106.8 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 9.17 | 107.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25002 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 1.67 | 16.6 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 230.6 (p) (Includes all plates)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,3 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |
| 1,3 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,3 | 1 | 1 | 0.00 | -1.86 | 0.00 | 1.86 | 0.0 | 1.03 | 0.14 | 0.17 | 0.06 | 0.66 | OK->ColumnWebRupture | 0.0229 | 0.0884 |
| 1,3 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 99.00 | RemoveInsetBeamCantilever | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/4/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.17 | 12.00 | 1 | 1 | 0.0 | -1.9 | -101.8 | 0.0 | 113.5 | 17.0 | 99.3 | 55.4 | 1.03 | 0.11 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 2.0 | -101.8 | 0.0 | 113.5 | 17.0 | 99.3 | 55.4 | 1.03 | 0.11 |
| 25002 | 0.00 | 12.00 | 1 | 1 | 0.0 | -0.4 | 3.7 | 0.0 | 96.5 | 16.7 | 68.7 | 39.0 | 0.05 | 0.02 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.17 | 240.00 | 240.0 | 240.0 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.17 | 1.00 | 1.13 | 0.84 | 1.00 |
| 25001 | 0.00 | 240.00 | 240.0 | 240.0 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.17 | 1.00 | 1.13 | 0.84 | 1.00 |
| 25002 | 0.00 | 240.00 | 240.0 | 240.0 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.17 | 1.00 | 1.15 | 0.59 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

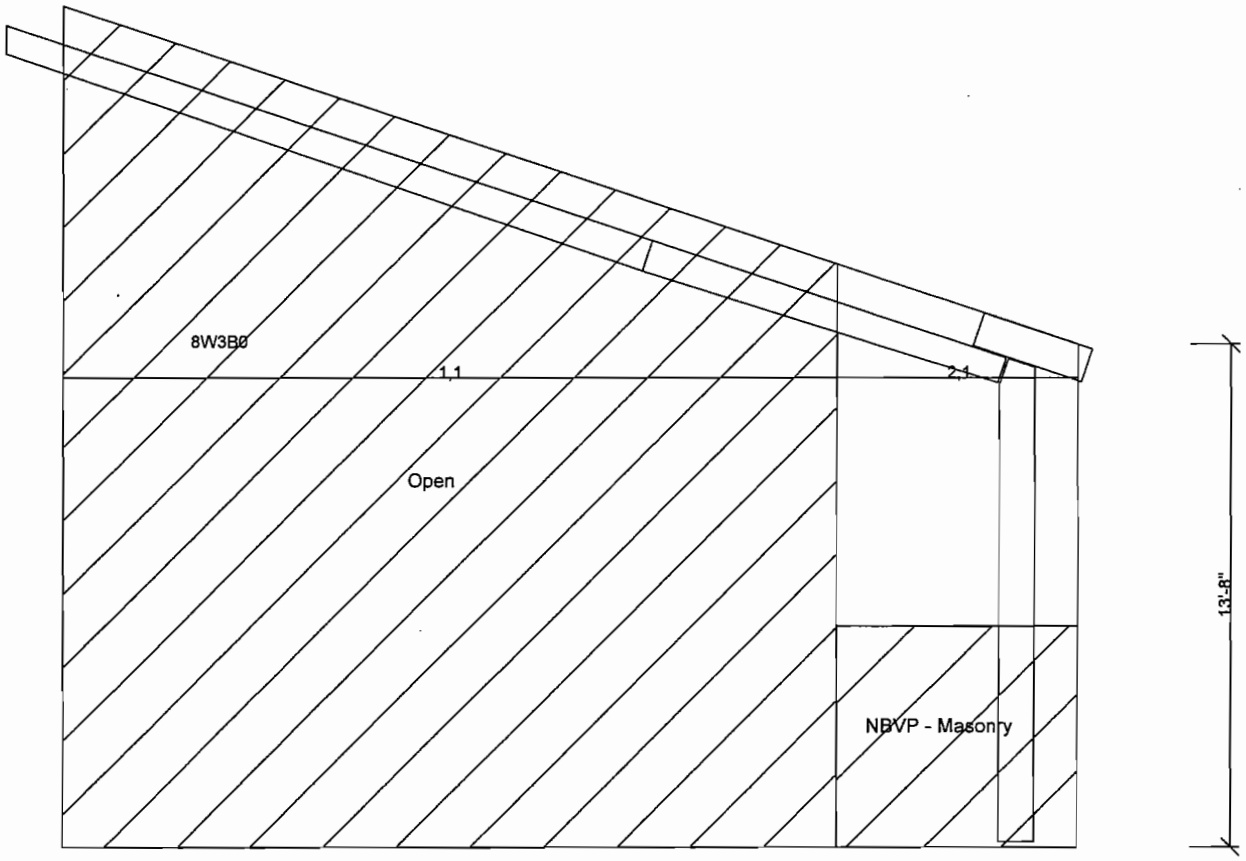
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,3)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1611 ) | 0.149 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 3**



**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 10.50 | 96.1 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 10.50 | 96.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 192.2 (p) (Includes all plates)
Frame Pricing Weight = 193.8 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 1,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 1,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 21/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 10.50 | 9.00 | 4 | 1 | 0.0 | -0.0 | -0.8 | 0.0 | 83.1 | 20.9 | 49.6 | 39.0 | 0.02 | 0.00 |
| 25001 | 0.00 | 9.00 | 4 | 1 | 0.0 | 0.0 | -0.8 | 0.0 | 83.1 | 20.9 | 49.6 | 39.0 | 0.02 | 0.00 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 10.50 | 252.00 | 252.0 | 252.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |
| 25001 | 0.00 | 252.00 | 252.0 | 252.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/61753 ) | -0.004 | 25001 | 1 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 6.50 | 61.7 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 61.7 (p) (Includes all plates)
Frame Pricing Weight = 62.5 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 2,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 2,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 6/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

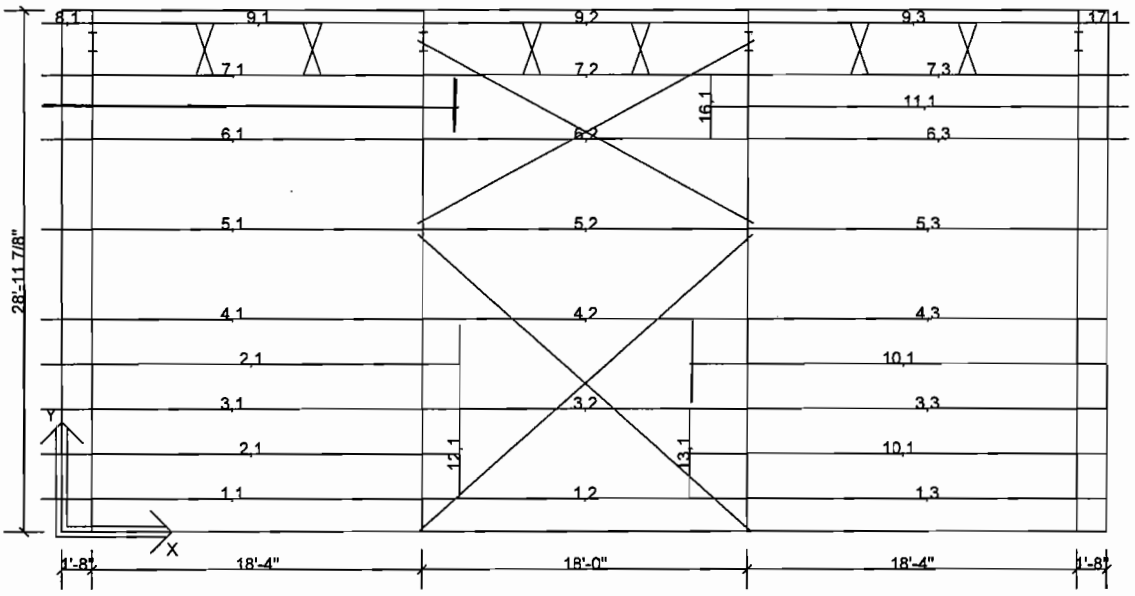
| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 3.25 | 9.00 | 1 | 1 | 0.0 | 0.9 | -18.2 | 0.0 | 83.1 | 20.9 | 169.5 | 39.0 | 0.11 | 0.04 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 3.25 | 78.00 | 78.0 | 78.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Roof: A**




**Maximum Secondary Designs for Shape Operations Building Lean-to on Side A**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.99 | 0.01 | 0.69 | 0.00 | 14 | 0.60 | 0.55 | 0.70 | 0.00 | 14 | 24 |
| 1,2 | 18.00 | 11.50x0.065 Z Con | Yes | 24 | 0.60 | 0.36 | 0.56 | 0.00 | 14 | 24 | 0.73 | 0.50 | 0.72 | 0.00 | 14 | 0.54 | 0.36 | 0.53 | 0.00 | 14 | 24 |
| 1,3 | 20.00 | 11.50x0.065 Z Con | Yes | 24 | 0.54 | 0.48 | 0.62 | 0.00 | 14 | 24 | 0.89 | 0.00 | 0.63 | 0.00 | 14 | | | | | | |
| 2,1 | 23.20 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.69 | 0.00 | 0.00 | 0.00 | 14 | | | | | | |
| 3,1 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.46 | 0.61 | 0.69 | 0.00 | 14 | 0.48 | 0.37 | 0.51 | 0.00 | 14 | 24 |
| 3,2 | 18.00 | 11.50x0.065 Z Con | Yes | 24 | 0.48 | 0.35 | 0.49 | 0.00 | 14 | 24 | 0.44 | 0.56 | 0.64 | 0.00 | 14 | 0.45 | 0.34 | 0.47 | 0.00 | 14 | 24 |
| 3,3 | 20.00 | 11.50x0.065 Z Con | Yes | 24 | 0.45 | 0.34 | 0.46 | 0.00 | 14 | 24 | 0.45 | 0.55 | 0.64 | 0.00 | 14 | | | | | | |
| 4,1 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.43 | 0.58 | 0.65 | 0.00 | 14 | 0.45 | 0.35 | 0.48 | 0.00 | 14 | 24 |
| 4,2 | 18.00 | 11.50x0.065 Z Con | Yes | 24 | 0.45 | 0.33 | 0.46 | 0.00 | 14 | 24 | 0.48 | 0.53 | 0.63 | 0.00 | 14 | 0.46 | 0.33 | 0.46 | 0.00 | 14 | 24 |
| 4,3 | 20.00 | 11.50x0.065 Z Con | Yes | 24 | 0.46 | 0.35 | 0.48 | 0.00 | 14 | 24 | 0.44 | 0.58 | 0.66 | 0.00 | 14 | | | | | | |
| 5,1 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.29 | 0.62 | 0.69 | 0.00 | 17 | 0.33 | 0.38 | 0.51 | 0.00 | 17 | 24 |
| 5,2 | 18.00 | 11.50x0.065 Z Con | Yes | 24 | 0.33 | 0.32 | 0.46 | 0.00 | 17 | 24 | 0.38 | 0.50 | 0.62 | 0.00 | 17 | 0.48 | 0.31 | 0.46 | 0.00 | 14 | 24 |
| 5,3 | 20.00 | 11.50x0.065 Z Con | Yes | 24 | 0.34 | 0.39 | 0.52 | 0.00 | 17 | 24 | 0.30 | 0.64 | 0.71 | 0.00 | 17 | | | | | | |
| 6,1 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.27 | 0.54 | 0.61 | 0.00 | 17 | 0.30 | 0.33 | 0.45 | 0.00 | 17 | 24 |
| 6,2 | 18.00 | 11.50x0.065 Z Con | Yes | 24 | 0.30 | 0.28 | 0.41 | 0.00 | 17 | 24 | 0.53 | 0.44 | 0.58 | 0.00 | 14 | 0.46 | 0.29 | 0.44 | 0.00 | 14 | 24 |
| 6,3 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | 0.46 | 0.38 | 0.50 | 0.00 | 14 | 24 | 0.40 | 0.63 | 0.69 | 0.00 | 14 | | | | | | |
| 7,1 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.20 | 0.42 | 0.46 | 0.00 | 17 | 0.22 | 0.26 | 0.34 | 0.00 | 17 | 24 |
| 7,2 | 18.00 | 11.50x0.065 Z Con | Yes | 24 | 0.22 | 0.21 | 0.31 | 0.00 | 17 | 24 | 0.72 | 0.41 | 0.66 | 0.00 | 14 | 0.56 | 0.31 | 0.51 | 0.00 | 14 | 24 |
| 7,3 | 21.12 | 11.50x0.065 Z Con | Yes | 24 | 0.56 | 0.52 | 0.65 | 0.00 | 14 | 24 | 0.95 | 0.00 | 0.66 | 0.00 | 14 | | | | | | |
| 8,1 | 2.79 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.00 | 0.02 | 0.00 | 14 | | | | | | |
| 9,1 | 18.33 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.72 | 0.00 | 0.47 | 0.00 | 14 | | | | | | |
| 9,2 | 18.00 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.71 | 0.00 | 0.47 | 0.00 | 14 | | | | | | |
| 9,3 | 18.33 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.64 | 0.00 | 0.00 | 0.00 | 14 | | | | | | |
| 10,1 | 23.20 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.93 | 0.00 | 0.61 | 0.00 | 14 | | | | | | |
| 11,1 | 23.20 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.87 | 0.00 | 0.57 | 0.00 | 14 | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.22 | 0.03 | 0.05 | 0.00 | 14 | | | | | | |
| 13,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.29 | 0.05 | 0.07 | 0.00 | 14 | | | | | | |
| 14,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.22 | 0.03 | 0.05 | 0.00 | 14 | | | | | | |
| 15,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.29 | 0.05 | 0.07 | 0.00 | 14 | | | | | | |
| 16,1 | 3.57 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.13 | 0.03 | 0.04 | 0.00 | 14 | | | | | | |
| 17,1 | 2.79 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.01 | 0.02 | 0.00 | 14 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building Lean-to on Side A**

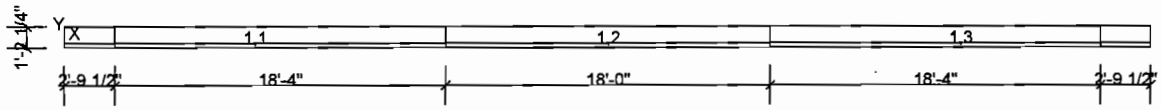
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.29 | ( L/760 ) | 11.29 | 1 | W1> |
| 1 | 2 | -0.08 | ( L/2706 ) | 27.63 | 1 | W1> |
| 1 | 3 | 0.26 | ( L/832 ) | 49.13 | 1 | W1> |
| 2 | 1 | 0.28 | ( L/799 ) | 11.79 | 1 | W1> |
| 3 | 1 | 0.15 | ( L/1444 ) | 10.79 | 1 | W1> |
| 3 | 2 | -0.07 | ( L/3101 ) | 30.13 | 6 | L |
| 3 | 3 | 0.14 | ( L/1562 ) | 49.63 | 1 | W1> |
| 4 | 1 | 0.15 | ( L/1469 ) | 10.79 | 1 | W1> |
| 4 | 2 | 0.00 | ( L/7764 ) | 30.13 | 6 | L |
| 4 | 3 | 0.16 | ( L/1396 ) | 49.63 | 1 | W1> |
| 5 | 1 | 0.17 | ( L/1260 ) | 10.79 | 1 | W1> |
| 5 | 2 | 0.00 | ( L/8845 ) | 24.63 | 1 | W1> |
| 5 | 3 | 0.19 | ( L/1145 ) | 49.13 | 1 | W1> |
| 6 | 1 | 0.15 | ( L/1422 ) | 10.79 | 1 | W1> |
| 6 | 2 | 0.00 | ( L/7276 ) | 34.63 | 1 | W1> |
| 6 | 3 | 0.19 | ( L/1139 ) | 49.13 | 1 | W1> |
| 7 | 1 | 0.14 | ( L/1580 ) | 11.29 | 1 | W1> |
| 7 | 2 | -0.08 | ( L/2836 ) | 33.13 | 1 | W1> |
| 7 | 3 | 0.28 | ( L/787 ) | 49.13 | 1 | W1> |
| 8 | 1 | - | - | - | - | - |
| 9 | 1 | 0.25 | ( L/883 ) | 9.00 | 1 | W1> |
| 9 | 2 | 0.24 | ( L/903 ) | 27.33 | 1 | W1> |
| 9 | 3 | 0.30 | ( L/731 ) | 45.33 | 1 | W1> |
| 10 | 1 | 0.31 | ( L/704 ) | 12.20 | 1 | W1> |
| 11 | 1 | 0.29 | ( L/751 ) | 11.08 | 1 | W1> |
| 12 | 1 | - | - | - | - | - |
| 13 | 1 | - | - | - | - | - |
| 14 | 1 | - | - | - | - | - |
| 15 | 1 | - | - | - | - | - |
| 16 | 1 | - | - | - | - | - |
| 17 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Operations Building Lean-to, Roof A, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.065 | -12.02 | 1 | 8 | 23.20 | N | 28.99 | 0.773 | 0.000 |
| 2 | 0.065 | -2.96 | 1 | 0 | 23.20 | Y | 28.99 | 0.773 | 0.000 |
| 3 | 0.065 | -9.43 | 1 | 7 | 18.00 | N | 28.99 | 0.600 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.34 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 0.25 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 0.20 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Wall: 2 - Canopy 1




**Maximum Secondary Designs for Shape Operations Building Lean-to on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 21.13 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.71 | 0.00 | 0.33 | 0.00 | 14 | | | | | | |
| 1,2 | 18.00 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 1.02 | 0.00 | 0.00 | 0.00 | 14 | | | | | | |
| 1,3 | 21.12 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.70 | 0.00 | 0.00 | 0.00 | 14 | | | | | | |

**Maximum Secondary Deflections for Shape Operations Building Lean-to on Side 2**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.21 | ( L/1061 ) | 11.79 | 1 | W1> |
| 1 | 2 | 0.24 | ( L/889 ) | 30.13 | 1 | W1> |
| 1 | 3 | 0.21 | ( L/1072 ) | 48.13 | 1 | W1> |

**Purlin Anchorage Forces for Shape Operations Building Lean-to, Roof Wall: 2 - Canopy 1, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|

## Framing - Summary Report

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

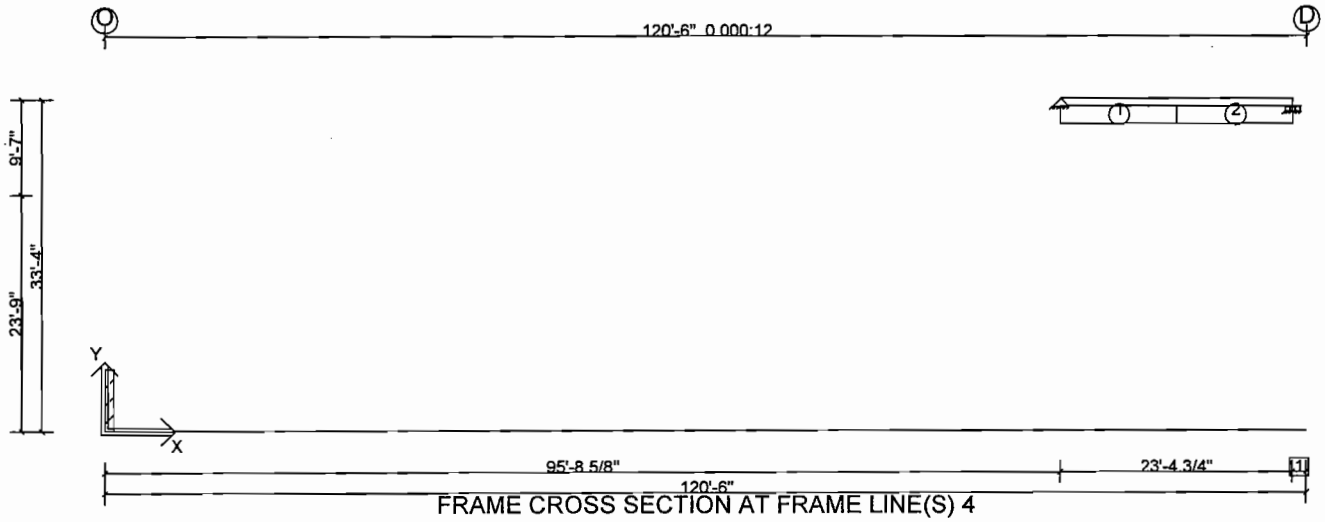
**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

**Operations Building : Mezzanine 1 @ 12/9/0**

| Floor Type | Non-Composite | Loading Type | Office |
|---|---|---|---|
| Top of Floor | 12/9/0 | Floor Dead Load | 50.00 psf |
| Total Thickness of Deck + Topping | 0/3/0 | Floor Live Load | 100.00 psf Not Reducible |
| Top of Joist | 12/6/0 | Collateral Load | 5.00 psf |
| Min. Clearance from Floor to Joist | 11/4/0 | Partition Load: | 10.00 psf |
| Min. Clearance from Floor to Rafter | 9/6/0 | Floor Live Load Deflection | 360 |
| Mezzanine Category | Entire Floor | Floor Dead + Floor Live Deflection | 240 |
| Bracing Category | Unbraced | | |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Wall: 1, Frame at: 37/0/0**
Frame Cross Section: 4



FRAME CROSS SECTION AT FRAME LINE(S) 4

**Dimension Key**
1 1'-4 5/8"

**Frame Clearances**
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 37/0/0 | 9/0/0 | Jack Beam 1 | 90.0000 | | 0/1/0 | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.00 | 0.1875 | 0.1345 | 21.00 | 21.00 | 11.70 | 213.5 | 55.00 | 55.00 | SS | SS | 3P |
| 2 | 6.00 | 0.2500 | 0.1345 | 21.00 | 21.00 | 11.70 | 247.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 460.5 (p) (Includes all plates)
Frame Pricing Weight = 466.6 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 95/8/10 | 33/4/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 2 | 119/1/6 | 33/4/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95/8/10 | 33/4/0 | - | - | - | - | - | - | - | - | 3.0 | 15 | 4.8 | 1 | - | - | - | - |
| 119/1/6 | 33/4/0 | - | - | - | - | - | - | - | - | 3.1 | 15 | 5.0 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 0.6 | 0.6 |
| FD | 0.0 | 0.0 | 0.0 | 0.0 |
| CG | 0.0 | 0.0 | 1.9 | 1.9 |
| L> | 0.0 | 0.0 | 7.3 | 7.3 |
| <L | 0.0 | 0.0 | 7.3 | 7.3 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 6.3 | 6.3 |
| <W1 | 0.0 | 0.0 | 6.4 | 6.4 |
| W2> | 0.0 | 0.0 | 2.6 | 2.6 |
| <W2 | 0.0 | 0.0 | 2.5 | 2.5 |
| WP | 0.0 | 0.0 | 0.1 | 0.1 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 7.3 | 7.3 |
| E> | 0.1 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.1 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 1 | SIP | 0.375 | 6.00 | 22.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 2 | 2 | SIP | 0.500 | 6.00 | 22.00 | 0.750 | A325/ | 3.00 | 12 | Flush | 2.50 | 13 | Flush | 2.50 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | | |
| 1 | 1 | 38 | | 3.9 | 0.0 | | 0.0 | 292.5 | 2 | | 4.8 | 0.0 | | 0.0 | 292.5 | | |
| 2 | 2 | 15 | | 3.2 | 866.4 | | 0.0 | 887.0 | 38 | | 3.5 | 1033.0 | | 0.0 | 1088.7 | | |

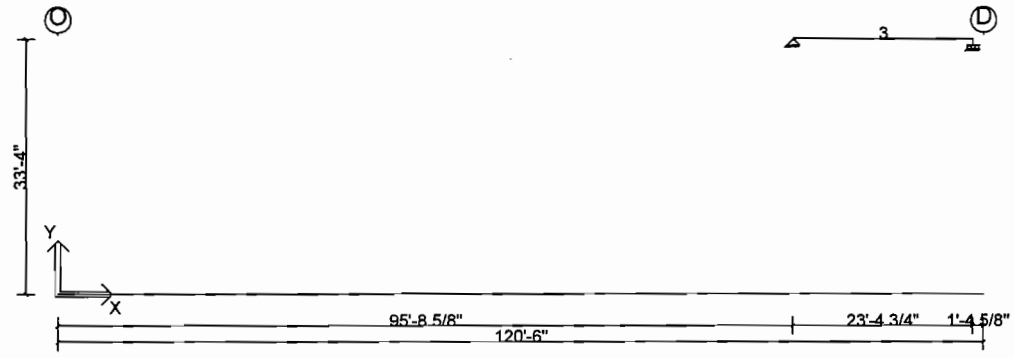
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 11.70 | 21.00 | 1 | 1 | 0.0 | 4.8 | 658.9 | 0.0 | 165.8 | 9.5 | 697.4 | 105.6 | 0.94 | 0.51 |
| 2 | 11.70 | 21.00 | 25 | 1 | 0.0 | -5.0 | 1033.0 | 0.0 | 190.0 | 9.6 | 1027.2 | 111.4 | 1.01 | 0.52 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.70 | 280.75 | 142.4 | 142.4 | 5.02 | 5.02 | 342.00 | 6.75 | 32.57 | 2.25 | 37.72 | 3.47 | 0.04 | 731.41 | 1.66 | 1.00 | 1.00 | 0.65 | 1.00 |
| 2 | 11.70 | 280.75 | 138.4 | 138.4 | 5.76 | 5.76 | 419.50 | 9.00 | 39.95 | 3.00 | 45.26 | 4.59 | 0.08 | 969.21 | 1.23 | 1.00 | 1.00 | 0.84 | 1.00 |

**User Defined Frame Point Loads for Cross Section: 4**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | p | D | support point TLK | -1.00 | 107/7/0 | NA | NA | Y | DOWN | 1.000 | OF |
| 3 | k | CG | | -1.00 | 107/8/1 | NA | NA | N | DOWN | 1.000 | OF |
| 3 | k | L | | -3.60 | 107/8/1 | NA | NA | N | DOWN | 1.000 | OF |
| 3 | k | W1> | | 3.60 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |
| 3 | k | <W1 | | 2.80 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |
| 3 | k | W2> | | 1.80 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |
| 3 | k | <W2 | | 0.80 | 107/8/1 | NA | NA | N | UP | 1.000 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 4**

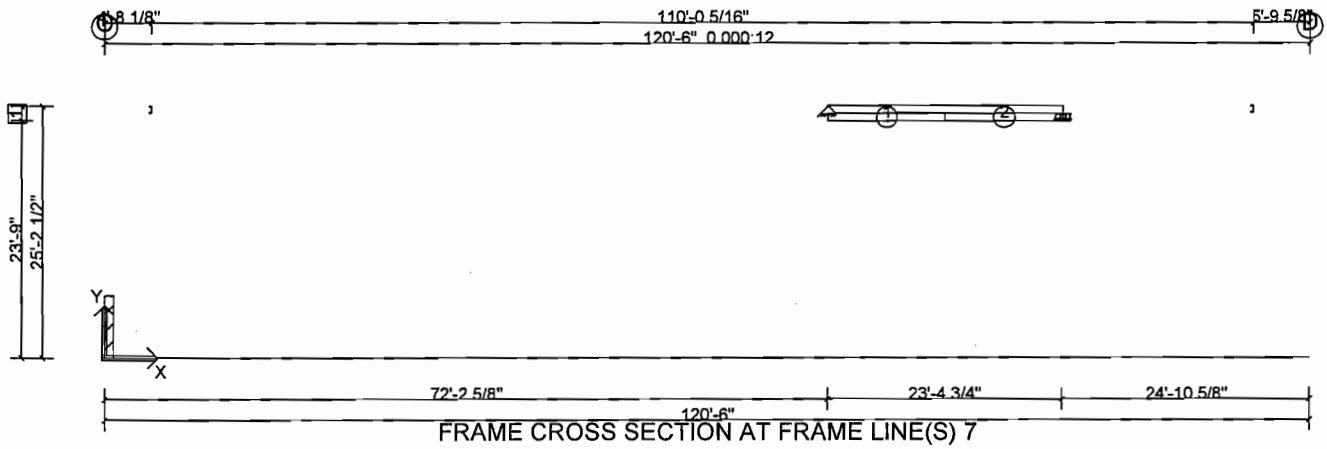
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/915 ) | -0.307 | 2 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Wall: 1, Frame at: 56/6/0

Frame Cross Section: 7




FRAME CROSS SECTION AT FRAME LINE(S) 7

**Dimension Key**
1 1'-5 1/2"

**Frame Clearances**
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 56/6/0 | 10/9/0 | Jack Beam 2 | 90.0000 | | 0/1/0 | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 11.70 | 126.9 | 55.00 | 55.00 | SS | SS | 3P |
| 2 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 11.70 | 126.9 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 253.7 (p) (Includes all plates)
Frame Pricing Weight = 255.3 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 72/2/10 | 25/2/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 2 | 95/7/6 | 25/2/8 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72/2/10 | 25/2/8 | - | - | - | - | - | - | - | - | - | - | 0.2 | 1 | - | - | - | - |
| 95/7/6 | 25/2/8 | - | - | - | - | - | - | - | - | - | - | 0.2 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal Load (k) | Horizontal Reaction (k) | Vertical Load (k) | Vertical Reaction (k) |
|---|---|---|---|---|
| D | 0.0 | 0.0 | 0.3 | 0.3 |
| FD | 0.0 | 0.0 | 0.0 | 0.0 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.1 | 0.1 |
| <L | 0.0 | 0.0 | 0.1 | 0.1 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.1 | 0.1 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Outside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | SIP | 0.375 | 6.00 | 10.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 2 | 2 | SIP | 0.375 | 6.00 | 10.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |

| Mem. No. | Jt. No. | Required Strength - Out Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - Out Design Proc. | Shear (k) | Moment (in-k) | Required Strength - In Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - In Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 35 | | 0.2 | 0.0 | | 0.0 | 101.0 | 37 | | 0.2 | 0.0 | | 0.0 | 101.0 |
| 2 | 2 | 51 | | 0.2 | 0.0 | | 0.0 | 101.0 | 43 | | 0.2 | 0.1 | | 0.0 | 101.0 |

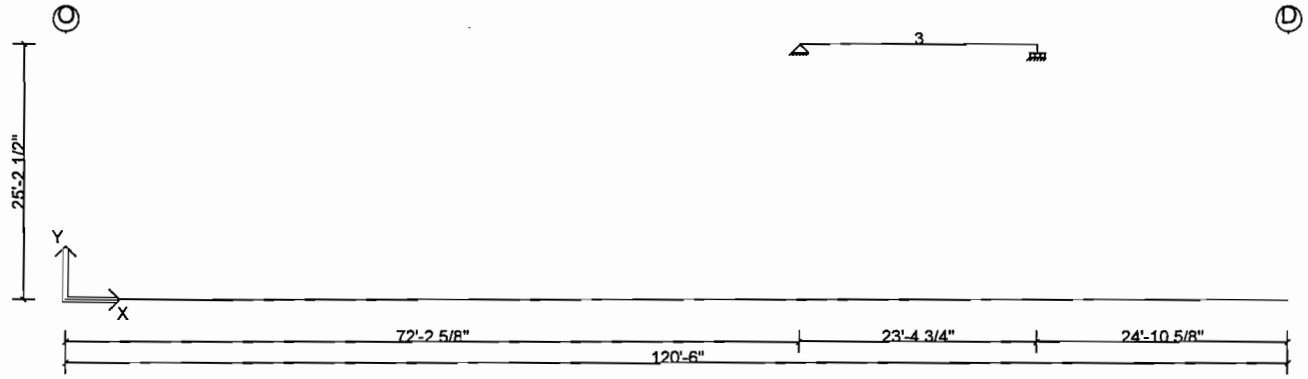
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.70 | 9.00 | 24 | 1 | 0.0 | 0.2 | 18.7 | 0.0 | 100.2 | 21.1 | 88.2 | 58.4 | 0.21 | 0.01 |
| 2 | 0.00 | 9.00 | 1 | 1 | 0.0 | -0.2 | 17.3 | 0.0 | 100.2 | 21.1 | 86.5 | 58.4 | 0.20 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.70 | 280.75 | 225.0 | 225.0 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.14 | 1.00 | 1.11 | 0.88 | 1.00 |
| 2 | 0.00 | 280.75 | 225.0 | 225.0 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.12 | 1.00 | 1.11 | 0.88 | 1.00 |

**User Defined Frame Point Loads for Cross Section: 7**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | p | D | support point TLK | -1.00 | 90/11/10 | NA | NA | Y | DOWN | 1.000 | OF |




**Deflection Load Combinations - Framing**

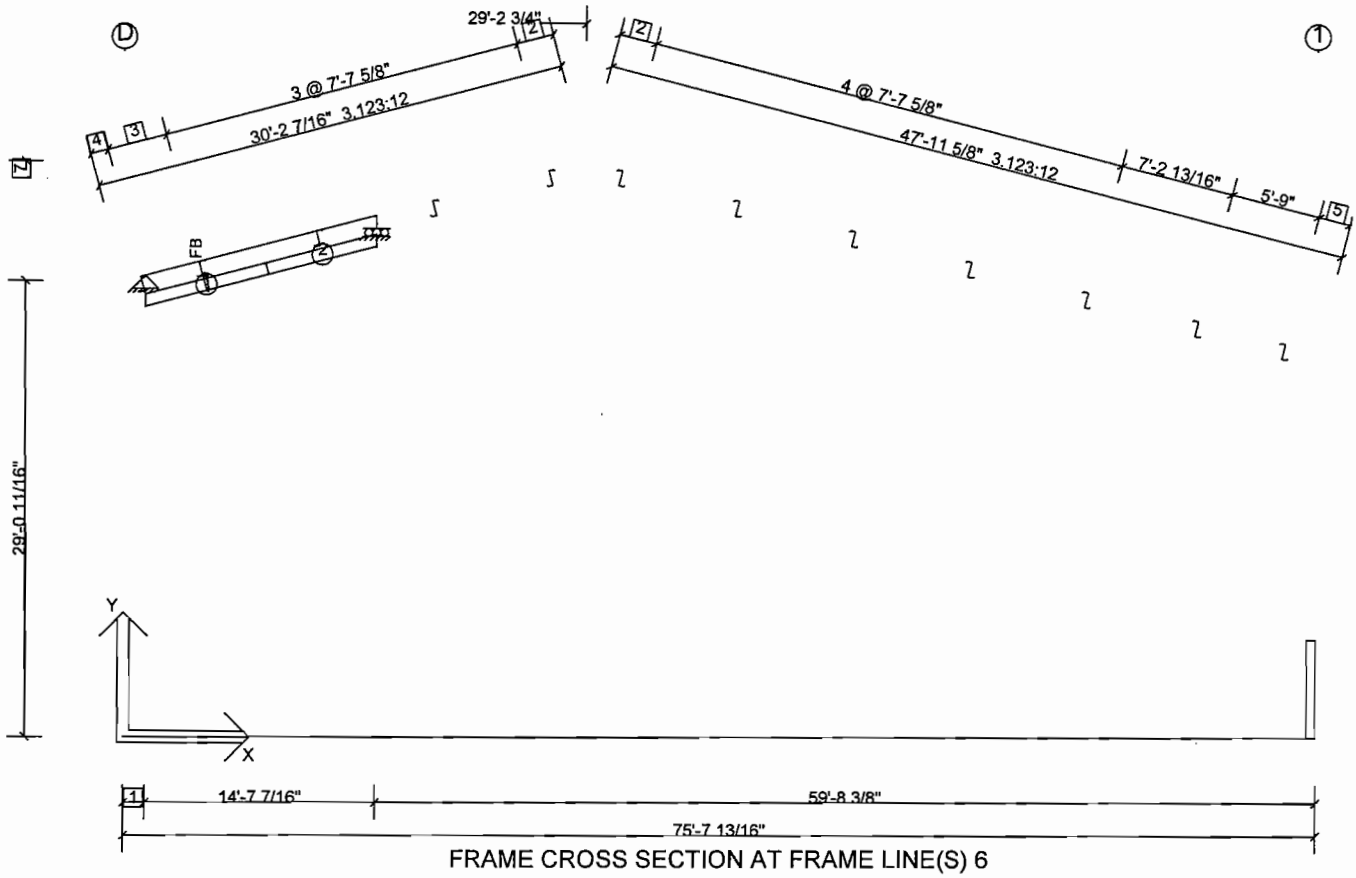
| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 7**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/20191 ) | -0.014 | 1 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 3, Frame at: 10/8/14**
Frame Cross Section: 6




FRAME CROSS SECTION AT FRAME LINE(S) 6

**Dimension Key**
1 1'-4"
2 2'-4 11/16"
3 3'-9 13/16"
4 1'-1 1/8"
5 2'-0 11/16"
6 1'-10"
7 36'-8" Ridge Ht.

**Frame Clearances**
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 10/8/14 | 9/3/0 | Valley Beam Right | 51.3402 | | 0/1/0 | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 7.55 | 88.4 | 55.00 | 55.00 | SS | SS | 3P |
| 2 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 7.55 | 80.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 168.5 (p) (Includes all plates)
Frame Pricing Weight = 174.5 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 2 | 15/11/7 | 33/2/8 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 1 | 1/4/0 | 29/4/14 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 6**

| Type<br>X-Loc<br>Grid1 - Grid2<br>Base Plate W x L (in.)<br>Base Plate Thickness (in.)<br>Anchor Rod Qty/Diam. (in.)<br>Column Base Elev. | | Rafter<br>15/11/7<br>y=33/2/8 | | | | | |
|---|---|---|---|---|---|---|---|
| Load Type | Desc. | Hx | Vy | | | | |
| D | Frm | - | 0.1 | - | - | - | - |
| FD | Frm | - | - | - | - | - | - |
| CG | Frm | - | 0.5 | - | - | - | - |
| L> | Frm | - | 1.8 | - | - | - | - |
| <L | Frm | - | 1.8 | - | - | - | - |
| S> | Frm | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - |
| W1> | Frm | - | -1.8 | - | - | - | - |
| <W1 | Frm | - | -1.4 | - | - | - | - |
| W2> | Frm | - | -0.9 | - | - | - | - |
| <W2 | Frm | - | -0.4 | - | - | - | - |
| WP | Frm | - | -0.0 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| FL | Frm | - | - | - | - | - | - |
| L | Frm | - | 1.8 | - | - | - | - |
| E> | Frm | - | - | - | - | - | - |
| EG+ | Frm | - | 0.0 | - | - | - | - |
| <E | Frm | - | - | - | - | - | - |
| EG- | Frm | - | -0.0 | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4/0 | 29/4/14 | - | - | - | - | - | - | - | - | 1.1 | 14 | 1.9 | 1 | - | - | - | - |
| 15/11/7 | 33/2/8 | - | - | - | - | - | - | - | - | 1.8 | 14 | 2.4 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 0.2 | 0.2 |
| FD | 0.0 | 0.0 | 0.0 | 0.0 |
| CG | 0.0 | 0.0 | 0.8 | 0.8 |
| L> | 0.0 | 0.0 | 3.3 | 3.3 |
| <L | 0.0 | 0.0 | 3.3 | 3.3 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |

| | | | | |
|---|---|---|---|---|
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 1.5 | 0.0 | 2.9 | 2.9 |
| <W1 | 1.1 | 0.0 | 2.2 | 2.2 |
| W2> | 0.7 | 0.0 | 1.4 | 1.4 |
| <W2 | 0.3 | 0.0 | 0.6 | 0.6 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 3.3 | 3.3 |
| E> | 0.1 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.1 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 1 | SIP | 0.375 | 6.00 | 10.30 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 2 | 2 | SIP | 0.375 | 6.00 | 10.30 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 1 | 2 | | 1.8 | 0.1 | | 0.0 | 101.0 | 48 | | 0.0 | 0.0 | | 0.0 | 101.0 |
| 2 | 2 | 2 | | 2.3 | 0.0 | | 0.0 | 101.0 | 14 | | 1.7 | 0.0 | | 0.0 | 101.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 1 | 3/10/0 | 25/3/8 | FB2060 | |

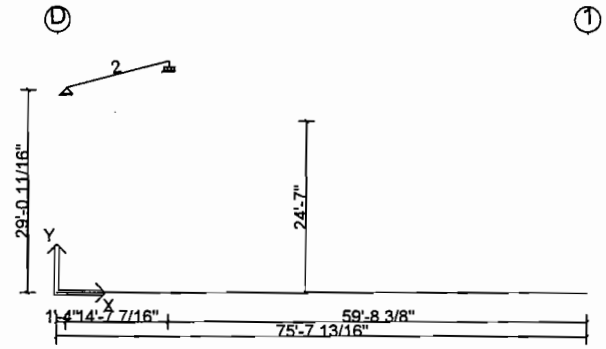
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial | Shear | Mom-x | Mom-y | Axial | Shear | Mom-x | Mom-y | Axial + | Shear |
| No. | ft | in. | Flexure | | Pr k | Vr k | Mrx in-k | Mry in-k | Pc k | Vc k | Mcx in-k | Mcy in-k | Flexure | |
| 1 | 7.55 | 9.00 | 1 | 1 | -0.0 | 1.8 | 97.2 | 0.0 | 68.3 | 21.1 | 292.8 | 58.4 | 0.33 | 0.09 |
| 2 | 0.00 | 9.00 | 1 | 1 | -0.0 | -2.3 | 97.2 | 0.0 | 68.3 | 21.1 | 292.8 | 58.4 | 0.33 | 0.11 |

| Mem. | Loc. | Lx | Ly/Lt | Lb | Ag | Afn | Ixx | Iyy | Sx | Sy | Zx | Zy | J | Cw | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ft | in. | in. | in. | in.2 | in.2 | in.4 | in.4 | in.3 | in.3 | in.3 | in.3 | in.4 | in.6 | | | | | |
| 1 | 7.55 | 181.28 | 138.9 | 91.6 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.11 | 1.00 | 1.11 | 0.88 | 0.89 |
| 2 | 0.00 | 181.28 | 138.9 | 91.6 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.11 | 1.00 | 1.11 | 0.88 | 0.89 |

**User Defined Frame Line Loads for Cross Section: 6**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | CG | | -84.00 | 13/8/10 | -30.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | L | | -335.00 | 13/8/10 | -118.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | | 295.00 | 13/8/10 | 104.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W1 | | 221.00 | 13/8/10 | 78.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | W2> | | 139.00 | 13/8/10 | 49.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W2 | | 65.00 | 13/8/10 | 23.00 | 28/9/15 | N | UP | 1.000 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

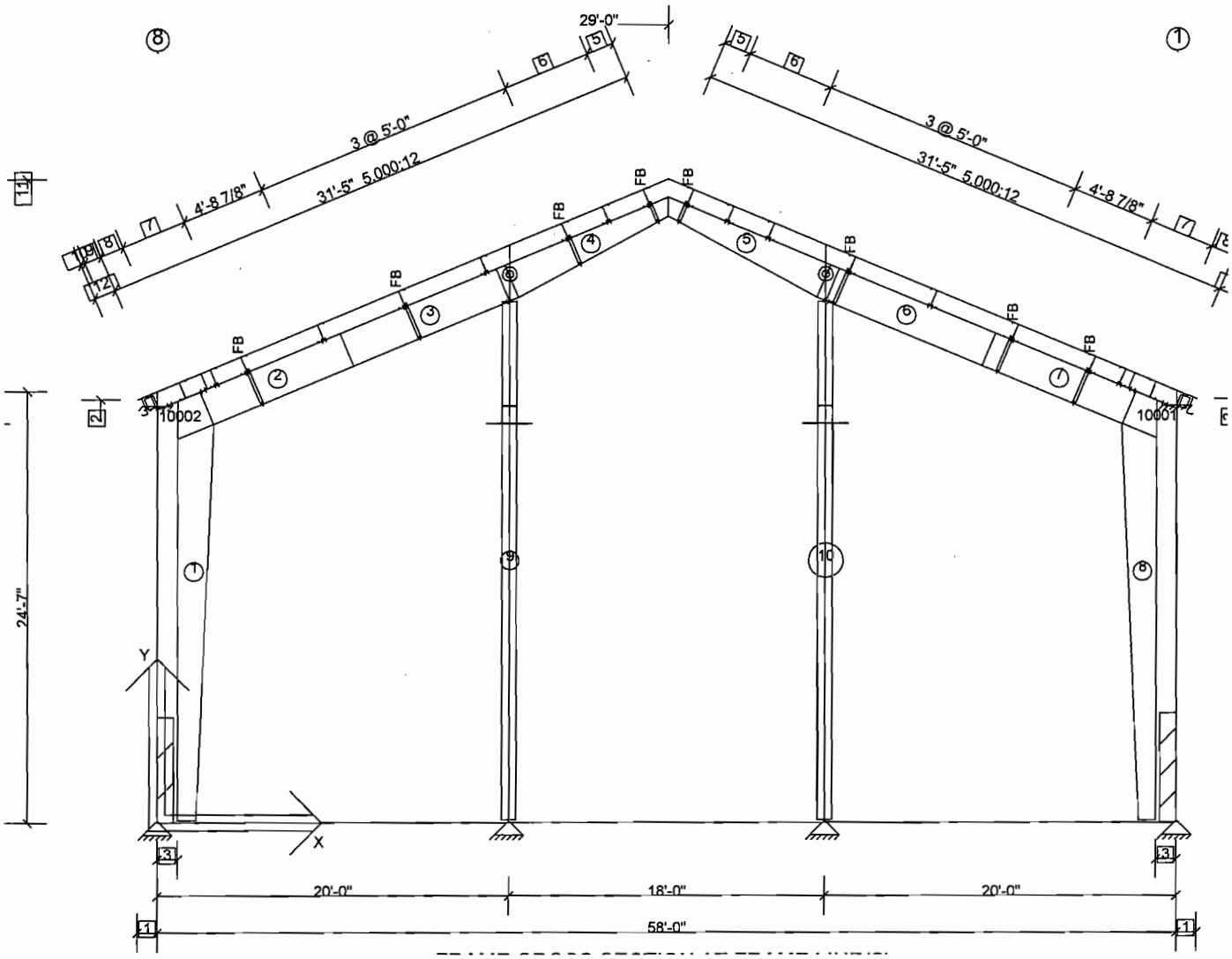
**Controlling Frame Deflection Ratios for Cross Section: 6**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/894 ) | -0.196 | 2 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 1/7/0**

Frame Cross Section:




**Dimension Key**

1 1'-1 1/2"
2 24'-1 3/8"
3 1'-2"
4 1'-10"
5 1'-6 13/16"
6 2 @ 2'-6"
7 2 @ 1'-10 9/16"
8 1'-4 3/16"
9 11 5/8"
10 3"
11 36'-8" Ridge Ht.
12 1'-2 5/8" 5.000:12

**Frame Clearances**

Horiz. Clearance between members 1(CX100) and 8(CX100): 51'-7 5/8"
Vert. Clearance at member 1(CX100): 22'-7 15/16"

Vert. Clearance at member 8(CX100): 22'-7 15/16"
Vert. Clearance at member 9(EPX100): 29'-8 9/16"
Vert. Clearance at member 10(EPX101): 29'-8 9/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 1/7/0 | 13/2/8 | CB2 End | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.00 | 0.3750 | 0.1644 | 12.00 | 24.00 | 23.91 | 761.8 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.2500 | 0.1345 | 24.00 | 24.00 | 9.98 | 187.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1875 | 0.1345 | 24.00 | 24.00 | 10.13 | 174.1 | 55.00 | 55.00 | SS | SS | 3P |
| 4 | 5.00 | 0.1875 | 0.1345 | 24.00 | 12.00 | 10.04 | 150.2 | 55.00 | 55.00 | SS | SP | 3P |
| 5 | 5.00 | 0.1875 | 0.1345 | 12.00 | 24.00 | 10.04 | 150.2 | 55.00 | 55.00 | SP | SS | 3P |
| 6 | 5.00 | 0.1875 | 0.1345 | 24.00 | 24.00 | 10.12 | 174.0 | 55.00 | 55.00 | SS | SS | 3P |
| 7 | 5.00 | 0.2500 | 0.1345 | 24.00 | 24.00 | 9.99 | 187.2 | 55.00 | 55.00 | SS | KN | 3P |
| 8 | 8.00 | 0.3750 | 0.1644 | 12.00 | 24.00 | 23.91 | 761.8 | 55.00 | 55.00 | BP | KN | 3P |
| 9 | 10.00 | 0.5000 | 0.1644 | 12.00 | 12.00 | 29.59 | 1220.8 | 55.00 | 55.00 | BP | CP | 3P |
| 10 | 10.00 | 0.5000 | 0.1644 | 12.00 | 12.00 | 29.59 | 1220.8 | 55.00 | 55.00 | BP | CP | 3P |

Total Frame Weight = 5056.6 (p) (Includes all plates)
Frame Pricing Weight = 5252.8 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 9 | No | Yes |
| 10 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 58/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 9 | 20/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10 | 38/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 58/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Exterior Column | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
| Grid1 - Grid2 | | -8 | | 5-O | | | 3-O | | | -1 | | |
| Base Plate W x L (in.) | | 9 x 13 | | 11 x 13 | | | 11 x 13 | | | 9 x 13 | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |
| D | Frm | 0.1 | 1.6 | - | - | 2.4 | - | - | 2.4 | -0.1 | 1.6 | - |
| FD | Frm | 0.1 | 7.1 | - | 0.2 | 11.8 | - | 0.2 | 11.8 | -0.1 | 7.1 | - |
| CG | Frm | 0.1 | 0.9 | - | - | 1.3 | - | - | 1.3 | -0.1 | 0.9 | - |
| L> | Frm | 0.2 | 3.4 | - | - | 5.3 | - | - | 5.3 | -0.2 | 3.4 | - |
| <L | Frm | 0.2 | 3.4 | - | - | 5.3 | - | - | 5.3 | -0.2 | 3.4 | - |
| S> | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| <S | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| S | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| SD | Frm | - | - | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - | - | - |
| US1* | Frm | - | 0.3 | - | - | 1.1 | - | - | 0.5 | - | 0.1 | - |
| *US1 | Frm | - | 0.1 | - | - | 0.5 | - | - | 1.1 | - | 0.3 | - |
| W1> | Frm | 4.7 | 0.5 | - | 7.4 | -9.7 | - | 7.3 | 2.9 | 4.8 | -7.8 | - |
| <W1 | Frm | -4.8 | -7.8 | - | -6.6 | 2.9 | - | -6.6 | -9.7 | -4.7 | 0.5 | - |
| W2> | Frm | 3.6 | 3.4 | - | - | -9.0 | - | - | 3.6 | 5.8 | -4.9 | - |
| <W2 | Frm | -5.8 | -4.9 | - | - | 3.6 | - | - | -9.0 | -3.6 | 3.4 | - |
| WP | Frm | 2.2 | -7.3 | - | - | -2.3 | - | - | -2.3 | -2.2 | -7.3 | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 14.3 | - | 0.4 | 23.7 | - | 0.4 | 23.7 | -0.2 | 14.3 | - |
| L | Frm | 0.2 | 3.4 | - | - | 5.3 | - | - | 5.3 | -0.2 | 3.4 | - |
| E> | Frm | 0.7 | 0.7 | - | 1.9 | -0.9 | - | 1.9 | 0.9 | 0.7 | -0.7 | - |
| EG+ | Frm | - | 0.2 | - | - | 0.4 | - | - | 0.4 | - | 0.2 | - |
| <E | Frm | -0.7 | -0.7 | - | -1.9 | 0.9 | - | -1.9 | -0.9 | -0.7 | 0.7 | - |
| EG- | Frm | - | -0.2 | - | - | -0.4 | - | - | -0.4 | - | -0.2 | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) | Load Case | Hrz Right (Hx) | Load Case | Hrz In (-Hz) | Load Case | Hrz Out (Hz) | Load Case | Uplift (-Vy) | Load Case | Vrt Down (Vy) | Load Case | Mom cw (-Mzz) | Load Case | Mom ccw (Mzz) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | (k) | | (k) | | (k) | | (k) | | (k) | | (k) | | (in-k) | | (in-k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -8 | 5.7 | 17 | 4.9 | 9 | - | - | - | - | 2.6 | 15 | 25.4 | 36 | - | - | - | - |
| 20/0/0 | 5-O | - | - | - | - | 6.5 | 15 | 7.6 | 9 | 1.2 | 14 | 40.0 | 37 | - | - | - | - |
| 38/0/0 | 3-O | - | - | - | - | 6.5 | 15 | 7.5 | 9 | 1.1 | 15 | 40.0 | 36 | - | - | - | - |
| 58/0/0 | -1 | 4.9 | 10 | 5.7 | 16 | - | - | - | - | 2.6 | 14 | 25.5 | 37 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 8.3 | 8.1 |
| FD | 0.0 | 0.0 | 37.8 | 37.8 |
| CG | 0.0 | 0.0 | 4.4 | 4.4 |
| L> | 0.0 | 0.0 | 17.5 | 17.5 |
| <L | 0.0 | 0.0 | 17.5 | 17.5 |
| S> | 0.0 | 0.0 | 2.0 | 2.0 |
| <S | 0.0 | 0.0 | 2.0 | 2.0 |
| S | 0.0 | 0.0 | 2.0 | 2.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 2.0 | 2.0 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 9.4 | 9.4 | 14.1 | 14.1 |
| <W1 | 9.4 | 9.4 | 14.1 | 14.1 |
| W2> | 9.4 | 9.4 | 6.9 | 6.9 |
| <W2 | 9.4 | 9.4 | 6.9 | 6.9 |
| WP | 0.0 | 0.0 | 19.3 | 19.3 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 76.0 | 76.0 |
| L | 0.0 | 0.0 | 17.5 | 17.5 |
| E> | 1.3 | 1.3 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 1.2 | 1.2 |
| <E | 1.3 | 1.3 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 1.2 | 1.2 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -8 | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 20/0/0 | 5-O | 9 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 38/0/0 | 3-O | 10 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 58/0/0 | -1 | 8 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 21.72 | 22.944 | 139.56 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 3 | 1 | S2 | 9.59 | 23.625 | 175.65 | N/A | N/A | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 6 | 1 | S2 | 0.54 | 23.625 | 175.65 | N/A | N/A | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 8 | 1 | S9 | 21.72 | 22.944 | 139.56 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | Gages In/Out | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 4 | 2 | SP | 0.375 | 6.00 | 14.05 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 5 | 1 | SP | 0.375 | 6.00 | 14.05 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 7 | 2 | KN(Face) | 0.500 | 6.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 8 | 2 | KN(Face) | 0.500 | 8.00 | 25.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 9 | 2 | CP | 0.375 | 11.00 | 13.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 3.00 | 11 | Flush | 3.00 |
| 10 | 2 | CP | 0.375 | 11.00 | 13.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 3.00 | 11 | Flush | 3.00 |

| | Required Strength - Out | Available Strength - Out | Required Strength - In | Available Strength - In |
|---|---|---|---|---|

| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 11 | -3.5 | 4.3 | 748.7 | Thin plate | 106.0 | 749.9 | 15 | 3.5 | 5.7 | 711.9 | Thin plate | 106.0 | 749.9 |
| 2 | 1 | 11 | -3.5 | 4.3 | 748.7 | Thin plate | 106.0 | 749.9 | 15 | 3.5 | 5.7 | 711.9 | Thin plate | 106.0 | 749.9 |
| 4 | 2 | 16 | 0.7 | 1.7 | 9.5 | Thin plate | 106.0 | 205.2 | 13 | 7.3 | 3.2 | 148.2 | Thin plate | 106.0 | 218.2 |
| 5 | 1 | 16 | 0.7 | 1.7 | 9.5 | Thin plate | 106.0 | 205.2 | 13 | 7.3 | 3.2 | 148.2 | Thin plate | 106.0 | 218.2 |
| 7 | 2 | 12 | -3.5 | 4.3 | 748.3 | Thin plate | 106.0 | 750.9 | 14 | 3.5 | 5.7 | 712.9 | Thin plate | 106.0 | 750.9 |
| 8 | 2 | 12 | -3.5 | 4.3 | 748.3 | Thin plate | 106.0 | 750.9 | 14 | 3.5 | 5.7 | 712.9 | Thin plate | 106.0 | 750.9 |
| 9 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| 10 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 2/11/0 | 26/3/10 | FB3024 | |
| 3 | 4/0/1 | 16/6/13 | FB3024 | |
| 4 | 3/10/8 | 6/6/13 | FB2110 | |
| 4 | 8/10/8 | 1/6/13 | FB2070 | |
| 5 | 1/2/0 | 1/6/13 | FB2070 | |
| 6 | 1/1/8 | 11/6/13 | FB3024 | |
| 7 | 1/0/1 | 21/6/13 | FB3024 | |
| 7 | 5/8/15 | 26/3/10 | FB3024 | |

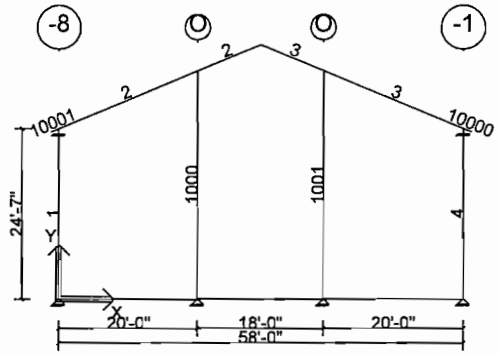
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.48 | 11.50 | 1 | 1 | 0.2 | 0.5 | -13.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 10002 | 2.48 | 11.50 | 1 | 1 | 0.2 | -0.5 | -13.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 1 | 15.05 | 20.00 | 12 | 18 | 2.7 | 3.5 | 661.8 | 0.0 | 302.4 | 18.9 | 1016.5 | 341.6 | 0.66 | 0.23 |
| 2 | 0.65 | 24.00 | 11 | 15 | -3.5 | -5.7 | -748.7 | 0.0 | 108.7 | 8.3 | 1089.4 | 95.5 | 0.70 | 0.68 |
| 3 | 0.00 | 24.00 | 14 | 14 | 0.1 | 5.7 | -344.0 | 0.0 | 166.7 | 8.2 | 759.0 | 50.1 | 0.45 | 0.69 |
| 4 | 0.00 | 24.00 | 22 | 35 | 0.1 | 3.5 | -266.5 | 0.0 | 166.7 | 8.2 | 656.2 | 50.1 | 0.41 | 0.43 |
| 5 | 0.21 | 12.00 | 13 | 34 | 7.3 | -3.6 | 148.2 | 0.0 | 113.5 | 17.0 | 407.7 | 55.4 | 0.40 | 0.43 |
| 6 | 9.99 | 24.00 | 15 | 15 | 0.1 | -5.7 | -343.4 | 0.0 | 166.7 | 8.2 | 863.1 | 50.1 | 0.40 | 0.69 |
| 7 | 8.66 | 24.00 | 12 | 14 | -3.5 | 5.7 | -748.3 | 0.0 | 108.7 | 8.3 | 1089.4 | 95.5 | 0.70 | 0.68 |
| 8 | 15.05 | 20.00 | 11 | 18 | 2.7 | -3.5 | 661.7 | 0.0 | 302.4 | 18.9 | 1016.4 | 341.6 | 0.66 | 0.23 |
| 9 | 12.38 | 12.00 | 35 | 9 | -40.2 | -7.6 | 567.4 | 0.0 | 99.6 | 33.0 | 1252.6 | 768.2 | 0.61 | 0.23 |
| 10 | 12.38 | 12.00 | 34 | 9 | -40.2 | -7.6 | -581.4 | 0.0 | 99.6 | 33.0 | 1080.6 | 768.2 | 0.69 | 0.23 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 15.05 | 270.94 | 270.9 | 270.9 | 9.16 | 9.16 | 675.51 | 32.01 | 67.55 | 8.00 | 74.11 | 12.13 | 0.31 | 3081.81 | 1.20 | 1.00 | 1.03 | 0.92 | 1.00 |
| 2 | 0.65 | 223.82 | 15.9 | 15.9 | 5.66 | 5.66 | 498.01 | 5.21 | 41.50 | 2.09 | 48.26 | 3.23 | 0.07 | 735.13 | 1.00 | 1.00 | 1.00 | 0.94 | 0.62 |
| 3 | 0.00 | 223.82 | 116.9 | 116.9 | 5.05 | 5.05 | 413.60 | 3.91 | 34.47 | 1.56 | 41.09 | 2.45 | 0.04 | 554.42 | 1.33 | 1.00 | 1.00 | 0.78 | 1.00 |
| 4 | 0.00 | 119.73 | 120.1 | 120.1 | 5.05 | 5.05 | 413.60 | 3.91 | 34.47 | 1.56 | 41.09 | 2.45 | 0.04 | 554.42 | 1.19 | 1.00 | 1.00 | 0.78 | 1.00 |
| 5 | 0.21 | 119.73 | 23.1 | 23.1 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.06 | 1.00 | 1.13 | 0.84 | 1.00 |
| 6 | 9.99 | 223.82 | 120.0 | 120.0 | 5.05 | 5.05 | 413.60 | 3.91 | 34.47 | 1.56 | 41.09 | 2.45 | 0.04 | 554.42 | 1.96 | 1.00 | 1.00 | 0.78 | 1.00 |
| 7 | 8.66 | 223.82 | 35.0 | 35.0 | 5.66 | 5.66 | 498.01 | 5.21 | 41.50 | 2.09 | 48.26 | 3.23 | 0.07 | 735.13 | 1.09 | 1.00 | 1.00 | 0.94 | 0.62 |
| 8 | 15.05 | 270.94 | 270.9 | 270.9 | 9.16 | 9.16 | 675.51 | 32.01 | 67.55 | 8.00 | 74.11 | 12.13 | 0.31 | 3081.81 | 1.20 | 1.00 | 1.03 | 0.92 | 1.00 |
| 9 | 12.38 | 368.00 | 355.0 | 355.0 | 11.81 | 11.81 | 349.07 | 83.34 | 58.18 | 16.67 | 62.47 | 25.07 | 0.85 | 2755.34 | 1.21 | 1.00 | 1.07 | 1.00 | 1.00 |
| 10 | 12.38 | 368.00 | 355.0 | 355.0 | 11.81 | 11.81 | 349.07 | 83.34 | 58.18 | 16.67 | 62.47 | 25.07 | 0.85 | 2755.34 | 1.04 | 1.00 | 1.07 | 1.00 | 1.00 |

**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -7.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -7.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1000 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | FD | Mezz | -11.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1000 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1001 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | FD | Mezz | -11.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1001 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

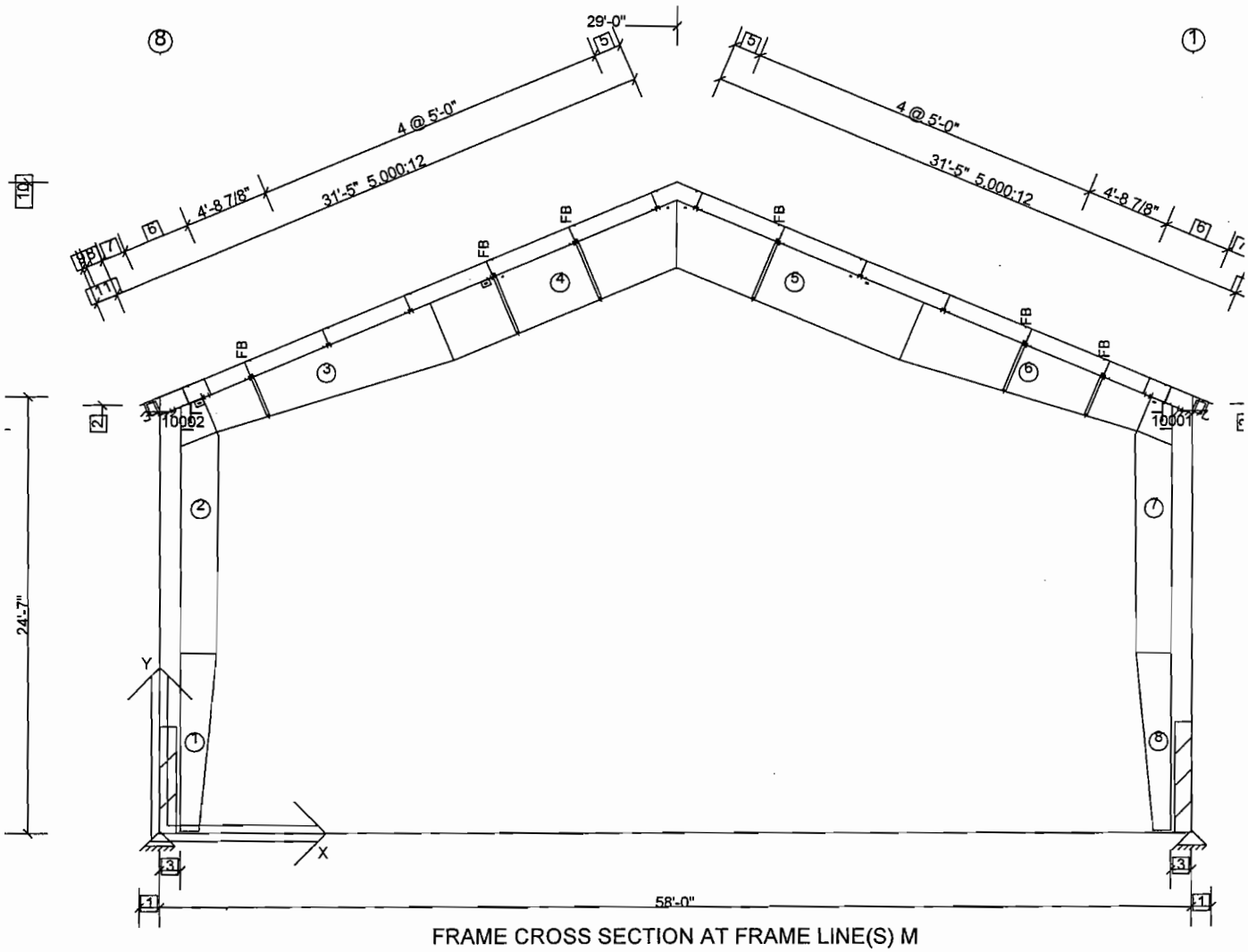
**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/202 ) | -1.378 | 1 | 2 | 12 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/1765 ) | 0.121 | 3 | 1 | 7 | W1> |
| Max. Vertical Deflection for Span 2 | ( L/3053 ) | -0.071 | 5 | 1 | 11 | WP |
| Max. Vertical Deflection for Span 3 | ( L/1765 ) | 0.121 | 6 | 2 | 8 | <W1 |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 24/10/0**
Frame Cross Section: M




FRAME CROSS SECTION AT FRAME LINE(S) M

**Dimension Key**
1 1'-1 1/2"
2 24'-1 3/8"
3 1'-2"
4 1'-10"
5 1'-6 13/16"
6 3'-9 3/16"
7 1'-4 3/16"
8 11 5/8"
9 3"
10 36'-8" Ridge Ht.
11 1'-2 5/8" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX101) and 7(CX102): 51'-6 15/16"
Horiz. Clearance between members 1(CX101) and 8(CX102): 51'-8"
Horiz. Clearance between members 2(CX101) and 7(CX102): 51'-5 7/8"

Horiz. Clearance between members 2(CX101) and 8(CX102): 51'-6 15/16"
Vert. Clearance at member 2(CX101): 22'-4 3/4"
Vert. Clearance at member 7(CX102): 22'-4 3/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 24/10/0 | 23/4/8 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.5 | 55.00 | 55.00 | BP | SS | 3P |
| 2 | 10.00 | 0.5000 | 0.1875 | 24.00 | 24.00 | 13.91 | 716.2 | 55.00 | 55.00 | SS | KN | 3P |
| 3 | 6.00 | 0.5000 | 0.1875 | 25.00 | 42.00 | 15.15 | 595.3 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 6.00 | 0.3125 | 0.1875 | 42.00 | 42.00 | 15.00 | 587.1 | 55.00 | 55.00 | SS | SP | 3P |
| 5 | 6.00 | 0.3125 | 0.1875 | 42.00 | 42.00 | 15.00 | 587.1 | 55.00 | 55.00 | SP | SS | 3P |
| 6 | 6.00 | 0.5000 | 0.1875 | 42.00 | 25.00 | 15.15 | 595.3 | 55.00 | 55.00 | SS | KN | 3P |
| 7 | 10.00 | 0.5000 | 0.1875 | 24.00 | 24.00 | 13.90 | 716.1 | 55.00 | 55.00 | SS | KN | 3P |
| 8 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.6 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 4792.8 (p) (Includes all plates)
Frame Pricing Weight = 5028.0 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 58/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 58/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: M**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | M-8 | | M-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.8 | 4.8 | -0.8 | 4.9 | - | - | - |
| FD | Frm | 0.1 | 6.4 | -0.1 | 6.4 | - | - | - |
| CG | Frm | 0.8 | 3.5 | -0.8 | 3.5 | - | - | - |
| L> | Frm | 3.1 | 14.1 | -3.1 | 14.1 | - | - | - |
| <L | Frm | 3.1 | 14.1 | -3.1 | 14.1 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 1.6 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 1.6 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 1.6 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | 0.4 | 2.0 | -0.4 | 1.2 | - | - | - |
| *US1 | Frm | 0.4 | 1.2 | -0.4 | 2.0 | - | - | - |
| W1> | Frm | 6.7 | -7.4 | 10.4 | -14.7 | - | - | - |
| <W1 | Frm | -10.4 | -14.7 | -6.7 | -7.4 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| W2> | Frm | 5.4 | -1.1 | 11.7 | -8.4 | - | - | - |
| <W2 | Frm | -11.7 | -8.4 | -5.4 | -1.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.3 | 12.7 | -0.3 | 12.7 | - | - | - |
| L | Frm | 3.1 | 14.1 | -3.1 | 14.1 | - | - | - |
| E> | Frm | 1.5 | 0.8 | 1.5 | -0.8 | - | - | - |
| EG+ | Frm | 0.0 | 0.3 | -0.0 | 0.3 | - | - | - |
| <E | Frm | -1.5 | -0.8 | -1.5 | 0.8 | - | - | - |
| EG- | Frm | -0.0 | -0.3 | 0.0 | -0.3 | - | - | - |
| WP | Frm | 3.3 | -11.7 | -3.3 | -11.7 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | M-8 | 11.2 | 16 | 9.3 | 30 | - | - | - | - | 8.0 | 14 | 34.9 | 27 | - | - | - | - |
| 58/0/0 | M-1 | 9.3 | 31 | 11.2 | 15 | - | - | - | - | 7.9 | 13 | 34.9 | 27 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.9 | 9.7 |
| FD | 0.0 | 0.0 | 12.8 | 12.8 |
| CG | 0.0 | 0.0 | 7.0 | 7.0 |
| L> | 0.0 | 0.0 | 28.2 | 28.2 |
| <L | 0.0 | 0.0 | 28.2 | 28.2 |
| S> | 0.0 | 0.0 | 3.3 | 3.3 |
| <S | 0.0 | 0.0 | 3.3 | 3.3 |
| S | 0.0 | 0.0 | 3.3 | 3.3 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 3.2 | 3.2 |
| *US1 | 0.0 | 0.0 | 3.2 | 3.2 |
| W1> | 17.1 | 17.1 | 22.1 | 22.1 |
| <W1 | 17.1 | 17.1 | 22.1 | 22.1 |
| W2> | 17.1 | 17.1 | 9.4 | 9.4 |
| <W2 | 17.1 | 17.1 | 9.4 | 9.4 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 25.4 | 25.4 |
| L | 0.0 | 0.0 | 28.2 | 28.2 |
| E> | 3.1 | 3.1 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.7 | 0.7 |
| <E | 3.1 | 3.1 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.7 | 0.7 |
| WP | 0.0 | 0.0 | 23.3 | 23.3 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.0 |
| EB> | 0.0 | 0.0 | 0.0 | 0.0 |
| <EB | 0.0 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | M-8 | 1 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 58/0/0 | M-1 | 8 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | S9 | 11.67 | 24.043 | 128.23 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 2 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |
| 7 | 1 | S9 | 11.66 | 24.043 | 128.23 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 7 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 2 | 2 | KN(Face) | 0.500 | 10.00 | 30.50 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.50/2.00 | 32 | Extended | 3.50/2.00 |
| 3 | 1 | KN(Face) | 0.500 | 6.00 | 30.50 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.50/2.00 | 32 | Extended | 3.50/2.00 |
| 4 | 2 | SP | 0.375 | 6.00 | 46.50 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 5 | 1 | SP | 0.375 | 6.00 | 46.50 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 6 | 2 | KN(Face) | 0.500 | 6.00 | 30.50 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.50/2.00 | 32 | Extended | 3.50/2.00 |
| 7 | 2 | KN(Face) | 0.500 | 10.00 | 30.50 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.50/2.00 | 32 | Extended | 3.50/2.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 2 | 2 | 32 | -10.3 | 12.8 | 1786.7 | Thin plate | 212.1 | 1753.5 | 14 | 6.9 | 9.6 | 1671.7 | Thin plate | 212.1 | 1753.5 |
| 3 | 1 | 32 | -10.3 | 12.8 | 1786.7 | Thin plate | 212.1 | 1753.5 | 14 | 6.9 | 9.6 | 1671.7 | Thin plate | 212.1 | 1753.5 |
| 4 | 2 | 14 | 8.1 | 2.4 | 296.3 | Thin plate | 106.0 | 903.5 | 1 | -4.6 | 1.4 | 1241.2 | Thin plate | 159.0 | 1123.0 |
| 5 | 1 | 14 | 8.1 | 2.4 | 296.3 | Thin plate | 106.0 | 903.5 | 1 | -4.6 | 1.4 | 1241.2 | Thin plate | 159.0 | 1123.0 |
| 6 | 2 | 33 | -10.3 | 12.8 | 1785.5 | Thin plate | 212.1 | 1753.5 | 13 | 6.9 | 9.5 | 1673.3 | Thin plate | 212.1 | 1753.5 |
| 7 | 2 | 33 | -10.3 | 12.8 | 1785.5 | Thin plate | 212.1 | 1753.5 | 13 | 6.9 | 9.5 | 1673.3 | Thin plate | 212.1 | 1753.5 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 3 | 2/11/6 | 26/3/10 | FB4020 | |
| 4 | 3/10/0 | 11/6/13 | FB5000 | |
| 4 | 8/10/0 | 6/6/13 | FB5000 | |
| 5 | 6/2/0 | 6/6/13 | FB5000 | |
| 6 | 6/2/0 | 21/6/13 | FB4060 | |
| 6 | 10/10/14 | 26/3/10 | FB4020 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

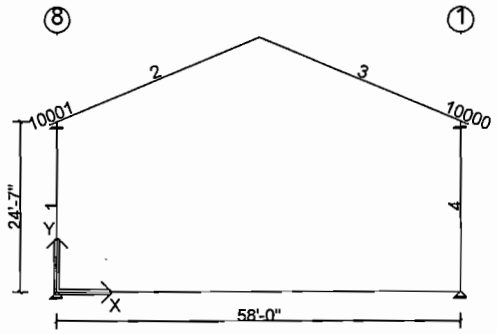
| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.48 | 11.50 | 1 | 1 | 0.4 | 0.8 | -20.7 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 10002 | 2.48 | 11.50 | 1 | 1 | 0.4 | -0.8 | -20.7 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 1 | 10.01 | 24.00 | 16 | 14 | 2.0 | 6.4 | 1023.0 | 0.0 | 472.3 | 23.6 | 3275.1 | 749.7 | 0.31 | 0.27 |
| 2 | 12.48 | 24.00 | 32 | 32 | -18.4 | -7.5 | -1791.5 | 0.0 | 349.3 | 23.6 | 4138.8 | 749.7 | 0.46 | 0.32 |
| 3 | 3.59 | 28.62 | 9 | 2 | 1.1 | 14.1 | -1120.0 | 0.0 | 347.5 | 19.5 | 1577.1 | 305.0 | 0.71 | 0.72 |
| 4 | 0.00 | 42.00 | 13 | 21 | 4.0 | 7.2 | -1020.1 | 0.0 | 379.8 | 12.7 | 1339.1 | 183.2 | 0.77 | 0.56 |
| 5 | 14.27 | 42.00 | 14 | 22 | 4.0 | -7.2 | -1018.3 | 0.0 | 379.8 | 12.7 | 1359.5 | 183.2 | 0.75 | 0.56 |
| 6 | 13.87 | 25.00 | 33 | 1 | -10.3 | -14.1 | -1785.5 | 0.0 | 240.1 | 22.6 | 2971.5 | 304.0 | 0.62 | 0.72 |
| 7 | 12.48 | 24.00 | 13 | 33 | 11.8 | 7.5 | 1686.3 | 0.0 | 457.2 | 23.6 | 3381.1 | 749.7 | 0.51 | 0.32 |
| 8 | 10.01 | 24.00 | 15 | 13 | 2.0 | -6.4 | 1022.9 | 0.0 | 472.3 | 23.6 | 3141.5 | 749.7 | 0.33 | 0.27 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.28 | 1.00 | 1.02 | 0.94 | 1.00 |
| 2 | 12.48 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.65 | 1.00 | 1.02 | 0.94 | 0.82 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 3.59 | 337.72 | 35.4 | 35.4 | 11.18 | 11.18 | 1515.39 | 18.02 | 105.90 | 6.01 | 120.12 | 9.24 | 0.56 | 3561.18 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |
| 4 | 0.00 | 337.72 | 177.0 | 177.0 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.01 | 1.00 | 1.00 | 0.96 | 1.00 |
| 5 | 14.27 | 337.72 | 180.1 | 180.1 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.06 | 1.00 | 1.00 | 0.96 | 1.00 |
| 6 | 13.87 | 337.72 | 35.4 | 35.4 | 10.50 | 10.50 | 1116.51 | 18.01 | 89.32 | 6.00 | 100.50 | 9.21 | 0.55 | 2703.12 | 1.11 | 1.00 | 1.01 | 1.00 | 0.74 |
| 7 | 12.48 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.29 | 1.00 | 1.02 | 0.94 | 1.00 |
| 8 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.23 | 1.00 | 1.02 | 0.94 | 1.00 |

**User Defined Frame Point Loads for Cross Section: M**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 14 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 15 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 18 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 19 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 20 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 23 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 24 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 25 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 26 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 27 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 28 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

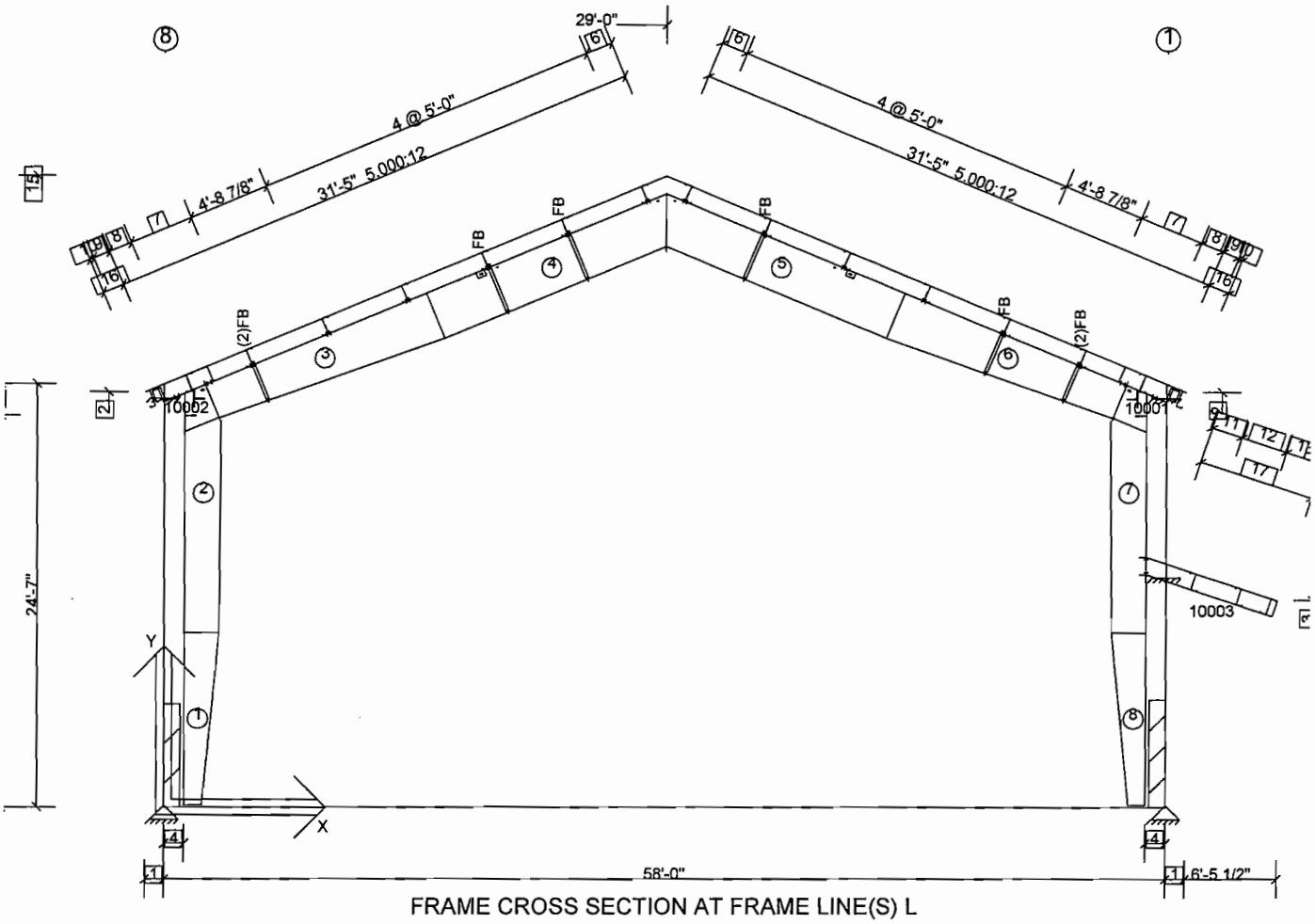
**Controlling Frame Deflection Ratios for Cross Section: M**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/218 ) | -1.274 | 7 | 2 | 16 | W1> |

| | | | | | | |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1517 ) | -0.424 | 4 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 48/4/0**
Frame Cross Section: L




FRAME CROSS SECTION AT FRAME LINE(S) L

**Dimension Key**
1 1'-1 1/2"
2 24'-1 3/8"
3 12'-0"
4 1'-2"
5 1'-10"
6 1'-6 13/16"
7 3'-9 3/16"
8 1'-4 3/16"
9 11 5/8"
10 3"
11 1'-9 13/16"
12 2'-9 3/16"
13 1'-10 3/16"
14 4 1/2"
15 36'-8" Ridge Ht.
16 1'-2 5/8" 5.000:12
17 6'-9 11/16" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX103) and 7(CX104): 51'-6 7/8"
Horiz. Clearance between members 1(CX103) and 8(CX104): 51'-8"
Horiz. Clearance between members 2(CX103) and 7(CX104): 51'-5 13/16"
Horiz. Clearance between members 2(CX103) and 8(CX104): 51'-6 7/8"
Vert. Clearance at member 2(CX103): 22'-4 5/8"
Vert. Clearance at member 7(CX104): 22'-4 5/8"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 48/4/0 | 23/8/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL. |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 10003 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 8.04 | 86.8 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.5 | 55.00 | 55.00 | BP | SS | 3P |
| 2 | 10.00 | 0.6250 | 0.1875 | 24.00 | 24.00 | 13.91 | 841.0 | 55.00 | 55.00 | SS | KN | 3P |
| 3 | 6.00 | 0.5000 | 0.1875 | 25.00 | 34.00 | 15.15 | 565.8 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 6.00 | 0.3125 | 0.1644 | 34.00 | 34.00 | 15.00 | 477.2 | 55.00 | 55.00 | SS | SP | 3P |
| 5 | 6.00 | 0.3125 | 0.1644 | 34.00 | 34.00 | 15.00 | 477.2 | 55.00 | 55.00 | SP | SS | 3P |
| 6 | 6.00 | 0.5000 | 0.1875 | 34.00 | 25.00 | 15.15 | 565.8 | 55.00 | 55.00 | SS | KN | 3P |
| 7 | 10.00 | 0.6250 | 0.1875 | 24.00 | 24.00 | 13.90 | 840.9 | 55.00 | 55.00 | SS | KN | 3P |
| 8 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.6 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 4850.4 (p) (Includes all plates)
Frame Pricing Weight = 5089.9 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 58/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 58/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10003 | 58/0/0 | 14/1/13 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: L**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | L-8 | | L-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.9 | 4.8 | -0.9 | 5.7 | - | - | - |
| FD | Frm | 0.1 | 6.4 | -0.1 | 6.4 | - | - | - |
| CG | Frm | 1.4 | 4.4 | -1.4 | 8.2 | - | - | - |
| L> | Frm | 3.5 | 14.1 | -3.5 | 16.4 | - | - | - |
| <L | Frm | 3.5 | 14.1 | -3.5 | 16.4 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 2.0 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 2.0 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 2.0 | - | - | - |
| SD | Frm | -0.1 | -0.1 | 0.1 | 1.5 | - | - | - |
| SS | Frm | - | - | - | 0.1 | - | - | - |
| US1* | Frm | 0.5 | 2.0 | -0.5 | 1.3 | - | - | - |
| *US1 | Frm | 0.5 | 1.2 | -0.5 | 2.0 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| W1> | Frm | 6.5 | -7.4 | 9.7 | -18.5 | - | - | - |
| <W1 | Frm | -10.9 | -14.9 | -6.8 | -8.6 | - | - | - |
| W2> | Frm | 5.2 | -1.0 | 10.9 | -12.1 | - | - | - |
| <W2 | Frm | -12.1 | -8.5 | -5.5 | -2.2 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 12.7 | -0.2 | 12.7 | - | - | - |
| L | Frm | 3.5 | 14.1 | -3.5 | 16.4 | - | - | - |
| E> | Frm | 1.6 | 0.9 | 1.7 | -1.0 | - | - | - |
| EG+ | Frm | 0.1 | 0.4 | -0.1 | 0.5 | - | - | - |
| <E | Frm | -1.6 | -0.9 | -1.7 | 1.0 | - | - | - |
| EG- | Frm | -0.1 | -0.4 | 0.1 | -0.5 | - | - | - |
| WP | Frm | 3.5 | -10.9 | -4.1 | -12.7 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | L-8 | 11.5 | 16 | 10.1 | 30 | - | - | - | - | 8.2 | 14 | 35.6 | 27 | - | - | - | - |
| 58/0/0 | L-1 | 10.3 | 31 | 10.4 | 15 | - | - | - | - | 11.2 | 13 | 42.2 | 27 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 10.8 | 10.5 |
| FD | 0.0 | 0.0 | 12.8 | 12.8 |
| CG | 0.0 | 0.0 | 12.6 | 12.6 |
| L> | 0.0 | 0.0 | 30.5 | 30.5 |
| <L | 0.0 | 0.0 | 30.5 | 30.5 |
| S> | 0.0 | 0.0 | 3.7 | 3.7 |
| <S | 0.0 | 0.0 | 3.7 | 3.7 |
| S | 0.0 | 0.0 | 3.7 | 3.7 |
| SD | 0.0 | 0.0 | 1.4 | 1.4 |
| SS | 0.0 | 0.0 | 0.1 | 0.1 |
| US1* | 0.0 | 0.0 | 3.3 | 3.3 |
| *US1 | 0.0 | 0.0 | 3.2 | 3.2 |
| W1> | 16.1 | 16.1 | 25.9 | 25.9 |
| <W1 | 17.7 | 17.7 | 23.4 | 23.4 |
| W2> | 16.1 | 16.1 | 13.1 | 13.1 |
| <W2 | 17.7 | 17.7 | 10.6 | 10.6 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 25.4 | 25.4 |
| L | 0.0 | 0.0 | 30.5 | 30.5 |
| E> | 3.3 | 3.4 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.8 | 0.8 |
| <E | 3.3 | 3.4 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.8 | 0.8 |
| WP | 0.6 | 0.6 | 23.6 | 23.6 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.0 |
| EB> | 0.0 | 0.0 | 0.0 | 0.0 |
| <EB | 0.0 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | L-8 | 1 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 58/0/0 | L-1 | 8 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | S9 | 11.67 | 23.849 | 127.19 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 2 | *** | MUST | Use | Alternate | Web | Thick.= | 0.3125 | * | * | * | * |
| 7 | 1 | S9 | 11.67 | 23.849 | 127.19 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 7 | *** | MUST | Use | Alternate | Web | Thick.= | 0.3125 | * | * | * | * |
| 7 | 3 | S5 | 4.39 | 23.164 | 123.54 | N/A | N/A | 0.1875 | 4.750 | Both | W-OS-0.1875 |
| 7 | 4 | S5 | 3.39 | 23.070 | 123.04 | N/A | N/A | 0.1875 | 4.750 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1000 | 2 | CIP | 0.375 | 6.00 | 13.12 | 0.500 | A325N/ST | 3.00 | 11 | Flush | 1.50 | 11 | Flush | 1.50 |
| 3 | | | | | | | | | | | | | | |
| 2 | 2 | KN(Face) | 0.625 | 10.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |
| 3 | 1 | KN(Face) | 0.625 | 6.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |
| 4 | 2 | SP | 0.375 | 6.00 | 40.83 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.94 |
| 5 | 1 | SP | 0.375 | 6.00 | 40.83 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.94 |
| 6 | 2 | KN(Face) | 0.625 | 6.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |
| 7 | 2 | KN(Face) | 0.625 | 10.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1000 | 2 | 1 | 1.0 | 3.1 | 175.6 | Thick plate | 37.7 | 186.6 | 13 | 0.2 | 3.3 | 182.7 | Thick plate | 37.7 | 186.6 |
| 3 | | | | | | | | | | | | | | | |
| 2 | 2 | 32 | -11.6 | 12.9 | 2015.1 | Thick plate | 159.0 | 1948.3 | 14 | 7.5 | 9.5 | 1775.3 | Thick plate | 159.0 | 1948.3 |
| 3 | 1 | 32 | -11.6 | 12.9 | 2015.1 | Thick plate | 159.0 | 1948.3 | 14 | 7.5 | 9.5 | 1775.3 | Thick plate | 159.0 | 1948.3 |
| 4 | 2 | 14 | 8.5 | 2.2 | 178.1 | Thin plate | 106.0 | 722.3 | 49 | 3.7 | 2.1 | 892.2 | Thin plate | 159.0 | 1199.1 |
| 5 | 1 | 14 | 8.5 | 2.2 | 178.1 | Thin plate | 106.0 | 722.3 | 49 | 3.7 | 2.1 | 892.2 | Thin plate | 159.0 | 1199.1 |
| 6 | 2 | 33 | -12.9 | 16.5 | 2128.6 | Thick plate | 159.0 | 1953.2 | 13 | 7.5 | 9.5 | 1772.4 | Thick plate | 159.0 | 1953.2 |
| 7 | 2 | 33 | -12.9 | 16.5 | 2128.6 | Thick plate | 159.0 | 1953.2 | 13 | 7.5 | 9.5 | 1772.4 | Thick plate | 159.0 | 1953.2 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 3 | 2/11/6 | 26/3/10 | (2)FB3044 | |
| 4 | 3/10/0 | 11/6/13 | FB4060 | |
| 4 | 8/10/0 | 6/6/13 | FB4060 | |
| 5 | 6/2/0 | 6/6/13 | FB4060 | |
| 6 | 6/2/0 | 21/6/13 | FB4030 | |
| 6 | 10/10/14 | 26/3/10 | (2)FB3044 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| 10001 | 2.48 | 11.50 | 1 | 1 | 0.4 | 0.9 | -21.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 10003 | 8.04 | 11.50 | 13 | 13 | 0.2 | -3.3 | 182.7 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.89 | 0.19 |
| 10002 | 2.48 | 11.50 | 1 | 1 | 0.4 | -0.9 | -21.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 1 | 10.01 | 24.00 | 16 | 21 | 2.2 | -7.0 | 1064.5 | 0.0 | 472.3 | 23.6 | 3309.5 | 749.7 | 0.32 | 0.30 |
| 2 | 12.48 | 24.00 | 32 | 32 | -19.2 | -8.4 | -2015.8 | 0.0 | 445.7 | 24.1 | 5292.5 | 1037.8 | 0.40 | 0.35 |
| 3 | 3.59 | 26.92 | 9 | 2 | 0.6 | 15.9 | -1210.0 | 0.0 | 336.3 | 20.8 | 1522.9 | 304.5 | 0.80 | 0.71 |
| 4 | 0.00 | 34.00 | 13 | 32 | 4.4 | 7.6 | -925.4 | 0.0 | 304.8 | 10.7 | 1087.8 | 179.2 | 0.86 | 0.71 |
| 5 | 14.41 | 34.00 | 14 | 33 | 4.3 | -7.6 | -934.4 | 0.0 | 304.8 | 10.7 | 1118.6 | 179.2 | 0.84 | 0.71 |
| 6 | 13.86 | 25.00 | 33 | 1 | -12.9 | -19.6 | -2128.6 | 0.0 | 240.0 | 22.6 | 2971.5 | 304.0 | 0.74 | 0.87 |
| 7 | 12.48 | 24.00 | 33 | 33 | -23.0 | 8.7 | -2157.6 | 0.0 | 445.7 | 24.1 | 5292.5 | 1037.8 | 0.43 | 0.36 |
| 8 | 10.01 | 24.00 | 33 | 22 | -41.2 | 7.0 | -891.2 | 0.0 | 169.5 | 23.6 | 3426.2 | 749.7 | 0.31 | 0.30 |

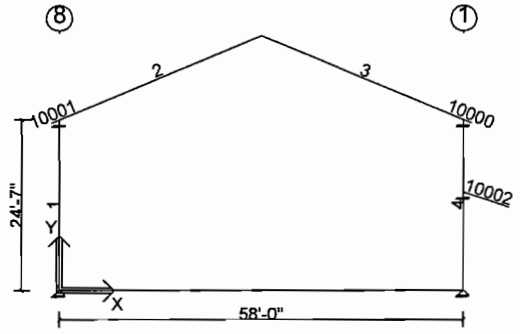
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10003 | 8.04 | 96.45 | 96.4 | 96.4 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.29 | 1.00 | 1.02 | 0.94 | 1.00 |
| 2 | 12.48 | 269.94 | 269.9 | 269.9 | 16.77 | 16.77 | 1891.85 | 104.18 | 157.65 | 20.84 | 170.35 | 31.45 | 1.68 | 14230.63 | 1.65 | 1.00 | 1.02 | 1.00 | 0.84 |
| 3 | 3.59 | 339.23 | 35.4 | 35.4 | 10.86 | 10.86 | 1318.83 | 18.01 | 98.00 | 6.00 | 110.73 | 9.23 | 0.56 | 3142.66 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |
| 4 | 0.00 | 339.23 | 176.9 | 176.9 | 9.24 | 9.24 | 1573.26 | 11.26 | 92.54 | 3.75 | 108.94 | 5.85 | 0.17 | 3195.26 | 1.01 | 1.00 | 1.00 | 0.96 | 1.00 |
| 5 | 14.41 | 339.23 | 180.0 | 180.0 | 9.24 | 9.24 | 1573.26 | 11.26 | 92.54 | 3.75 | 108.94 | 5.85 | 0.17 | 3195.27 | 1.08 | 1.00 | 1.00 | 0.96 | 1.00 |
| 6 | 13.86 | 339.23 | 35.4 | 35.4 | 10.50 | 10.50 | 1116.51 | 18.01 | 89.32 | 6.00 | 100.50 | 9.21 | 0.55 | 2703.12 | 1.12 | 1.00 | 1.01 | 1.00 | 0.74 |
| 7 | 12.48 | 269.94 | 269.9 | 269.9 | 16.77 | 16.77 | 1891.85 | 104.18 | 157.65 | 20.84 | 170.35 | 31.45 | 1.68 | 14230.63 | 1.34 | 1.00 | 1.02 | 1.00 | 0.84 |
| 8 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.39 | 1.00 | 1.02 | 0.94 | 0.86 |

**User Defined Frame Point Loads for Cross Section: L**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 3 | k | CG | Folding Partition (open)->Resolved From Plane | -2.60 | 24/0/0 | NA | NA | N | DOWN | 1.000 | OF |
| 4 | k | FL | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -6.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |

**User Defined Frame Line Loads for Cross Section: L**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | plf | CG | Folding Partition->Resolved From Plane | -104.06 | 2/0/0 | -104.06 | 27/0/0 | N | DOWN | 1.000 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 14 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 15 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 18 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 19 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 20 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 23 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 24 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 25 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 26 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 27 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |

| | | | | | | |
|---|---|---|---|---|---|---|
| 28 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

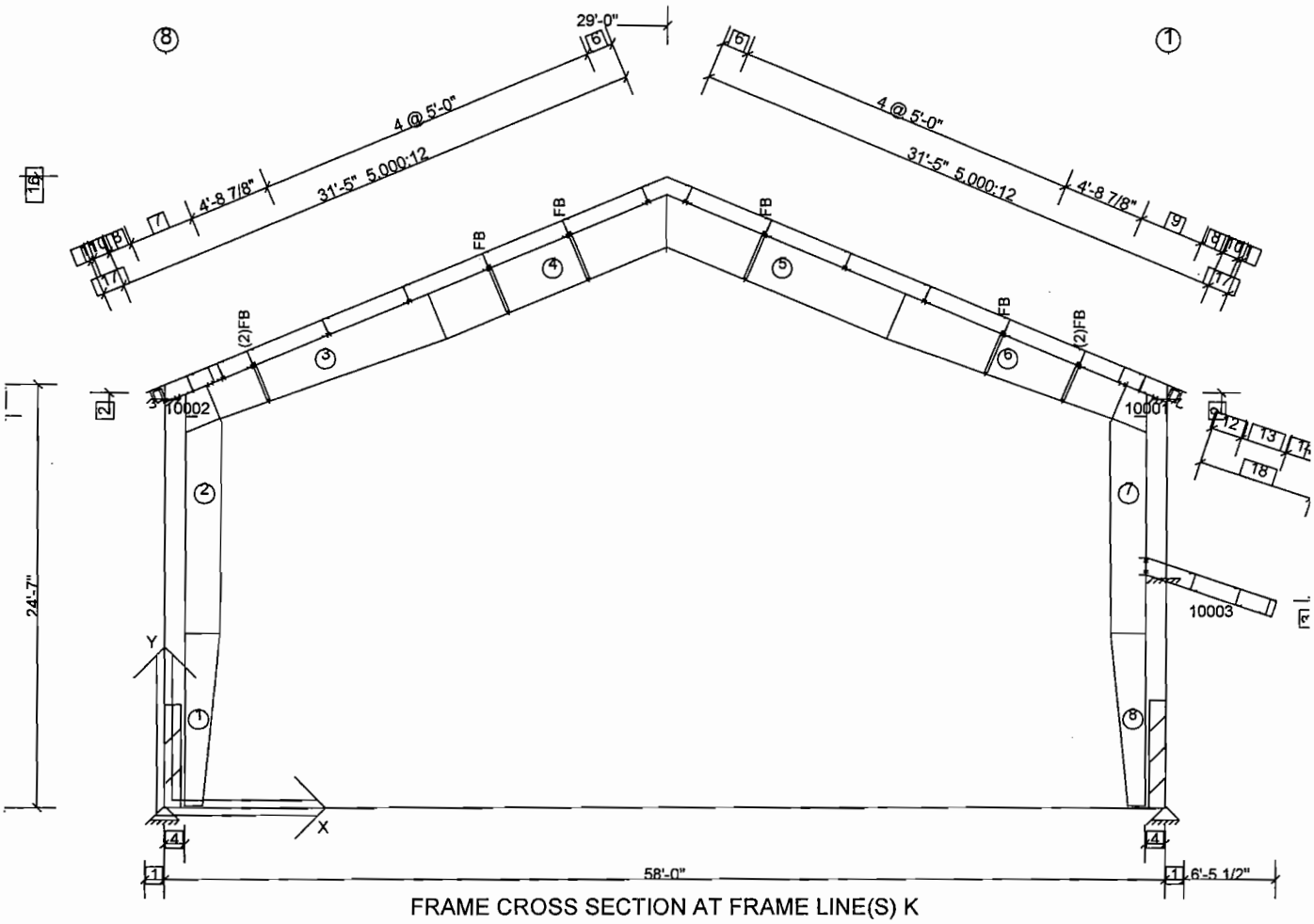
**Controlling Frame Deflection Ratios for Cross Section: L**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/205 ) | 1.353 | 2 | 2 | 17 | <W1 |
| Max. Vertical Deflection for Span 1 | ( L/1254 ) | -0.513 | 5 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 72/2/0**
Frame Cross Section: K




FRAME CROSS SECTION AT FRAME LINE(S) K

**Dimension Key**
1 1'-1 1/2"
2 24'-1 3/8"
3 12'-0"
4 1'-2"
5 1'-10"
6 1'-6 13/16"
7 2 @ 1'-10 9/16"
8 1'-4 3/16"
9 3'-9 3/16"
10 11 5/8"
11 3"
12 1'-9 13/16"
13 2'-9 3/16"
14 1'-10 3/16"
15 4 1/2"
16 36'-8" Ridge Ht.
17 1'-2 5/8" 5.000:12
18 6'-9 11/16" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX105) and 7(CX106): 51'-6 7/8"
Horiz. Clearance between members 1(CX105) and 8(CX106): 51'-8"
Horiz. Clearance between members 2(CX105) and 7(CX106): 51'-5 13/16"
Horiz. Clearance between members 2(CX105) and 8(CX106): 51'-6 7/8"
Vert. Clearance at member 2(CX105): 22'-4 5/8"
Vert. Clearance at member 7(CX106): 22'-4 5/8"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 72/2/0 | 16/6/8 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 10003 | 5.00 | 0.1875 | 0.1345 | 11.50 | 11.50 | 8.04 | 104.0 | 55.00 | 55.00 | SS | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.5 | 55.00 | 55.00 | BP | SS | 3P |
| 2 | 10.00 | 0.6250 | 0.1875 | 24.00 | 24.00 | 13.91 | 836.8 | 55.00 | 55.00 | SS | KN | 3P |
| 3 | 6.00 | 0.5000 | 0.1875 | 25.00 | 34.00 | 15.15 | 563.2 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 6.00 | 0.3125 | 0.1644 | 34.00 | 34.00 | 15.00 | 477.2 | 55.00 | 55.00 | SS | SP | 3P |
| 5 | 6.00 | 0.3125 | 0.1644 | 34.00 | 34.00 | 15.00 | 477.2 | 55.00 | 55.00 | SP | SS | 3P |
| 6 | 6.00 | 0.5000 | 0.1875 | 34.00 | 25.00 | 15.15 | 565.8 | 55.00 | 55.00 | SS | KN | 3P |
| 7 | 10.00 | 0.6250 | 0.1875 | 24.00 | 24.00 | 13.90 | 840.9 | 55.00 | 55.00 | SS | KN | 3P |
| 8 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.6 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 4860.9 (p) (Includes all plates)
Frame Pricing Weight = 5076.2 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 58/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 58/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10003 | 58/0/0 | 14/1/13 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: K**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | K-8 | | K-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.8 | 4.9 | -0.8 | 6.2 | - | - | - |
| FD | Frm | 0.2 | 12.7 | -0.2 | 12.7 | - | - | - |
| CG | Frm | 0.9 | 3.6 | -0.9 | 5.0 | - | - | - |
| L> | Frm | 3.4 | 14.0 | -3.4 | 17.6 | - | - | - |
| <L | Frm | 3.4 | 14.0 | -3.4 | 17.6 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 2.3 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 2.3 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 2.3 | - | - | - |
| SD | Frm | -0.2 | -0.2 | 0.2 | 2.3 | - | - | - |
| SS | Frm | -0.0 | -0.0 | 0.0 | 0.2 | - | - | - |
| US1* | Frm | 0.5 | 2.0 | -0.5 | 1.3 | - | - | - |
| *US1 | Frm | 0.5 | 1.2 | -0.5 | 2.0 | - | - | - |
| W1> | Frm | 6.5 | -7.4 | 9.0 | -20.4 | - | - | - |
| <W1 | Frm | -10.9 | -14.8 | -7.0 | -9.1 | - | - | - |
| W2> | Frm | 5.2 | -1.0 | 10.3 | -14.0 | - | - | - |
| <W2 | Frm | -12.2 | -8.4 | -5.7 | -2.7 | - | - | - |
| WP | Frm | 3.6 | -11.0 | -4.1 | -12.8 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.5 | 25.4 | -0.5 | 25.4 | - | - | - |
| L | Frm | 3.4 | 14.0 | -3.4 | 17.6 | - | - | - |
| E> | Frm | 1.8 | 1.0 | 1.9 | -1.0 | - | - | - |
| EG+ | Frm | 0.0 | 0.5 | -0.0 | 0.6 | - | - | - |
| <E | Frm | -1.8 | -1.0 | -1.9 | 1.0 | - | - | - |
| EG- | Frm | -0.0 | -0.5 | 0.0 | -0.6 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | K-8 | 11.5 | 17 | 9.8 | 34 | - | - | - | - | 4.3 | 15 | 50.7 | 31 | - | - | - | - |
| 58/0/0 | K-1 | 10.2 | 35 | 9.6 | 16 | - | - | - | - | 9.1 | 14 | 56.1 | 31 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load | Reaction | Load | Reaction |

| | (k) | (k) | (k) | (k) |
|---|---|---|---|---|
| D | 0.0 | 0.0 | 11.4 | 11.0 |
| FD | 0.0 | 0.0 | 25.4 | 25.4 |
| CG | 0.0 | 0.0 | 8.6 | 8.6 |
| L> | 0.0 | 0.0 | 31.6 | 31.6 |
| <L | 0.0 | 0.0 | 31.6 | 31.6 |
| S> | 0.0 | 0.0 | 3.9 | 3.9 |
| <S | 0.0 | 0.0 | 3.9 | 3.9 |
| S | 0.0 | 0.0 | 3.9 | 3.9 |
| SD | 0.0 | 0.0 | 2.1 | 2.1 |
| SS | 0.0 | 0.0 | 0.1 | 0.1 |
| US1* | 0.0 | 0.0 | 3.2 | 3.2 |
| *US1 | 0.0 | 0.0 | 3.2 | 3.2 |
| W1> | 15.5 | 15.5 | 27.8 | 27.8 |
| <W1 | 17.9 | 17.9 | 24.0 | 24.0 |
| W2> | 15.5 | 15.5 | 15.0 | 15.0 |
| <W2 | 17.9 | 17.9 | 11.1 | 11.1 |
| WP | 0.5 | 0.5 | 23.8 | 23.8 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 50.8 | 50.8 |
| L | 0.0 | 0.0 | 31.6 | 31.6 |
| E> | 3.7 | 3.7 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 1.1 | 1.1 |
| <E | 3.7 | 3.7 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 1.1 | 1.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | K-8 | 1 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 58/0/0 | K-1 | 8 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | S9 | 11.67 | 23.849 | 127.19 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 2 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |
| 7 | 1 | S9 | 11.67 | 23.849 | 127.19 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 7 | *** | MUST | Use | Alternate | Web | Thick.= | 0.3125 | * | * | * | * |
| 7 | 3 | S5 | 4.39 | 23.164 | 123.54 | N/A | N/A | 0.1875 | 4.750 | Both | W-OS-0.1875 |
| 7 | 4 | S5 | 3.40 | 23.070 | 123.04 | N/A | N/A | 0.1875 | 4.750 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1000 3 | 2 | CIP | 0.500 | 6.00 | 13.12 | 0.500 | A325N/ST | 3.00 | 12 | Flush | 1.50 | 12 | Flush | 1.50 |
| 2 | 2 | KN(Face) | 0.625 | 10.00 | 28.38 | 0.750 | A325X/ST | 3.00 | 13 | Flush | 2.00/2.00 | 31 | Extended | 3.75/2.00 |
| 3 | 1 | KN(Face) | 0.625 | 6.00 | 28.38 | 0.750 | A325X/ST | 3.00 | 13 | Flush | 2.00/2.00 | 31 | Extended | 3.75/2.00 |
| 4 | 2 | SP | 0.375 | 6.00 | 40.83 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.94 |
| 5 | 1 | SP | 0.375 | 6.00 | 40.83 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.94 |
| 6 | 2 | KN(Face) | 0.625 | 6.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |
| 7 | 2 | KN(Face) | 0.625 | 10.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1000 3 | 2 | 1 | 1.6 | 4.7 | 270.2 | Thick plate | 56.5 | 345.7 | 14 | 0.3 | 5.1 | 283.5 | Thick plate | 56.5 | 345.7 |
| 2 | 2 | 36 | -11.0 | 12.3 | 1870.9 | Thin plate | 212.1 | 1745.5 | 15 | 7.5 | 9.6 | 1793.6 | Thick plate | 159.0 | 1948.3 |
| 3 | 1 | 36 | -11.0 | 12.3 | 1870.9 | Thin plate | 212.1 | 1745.5 | 15 | 7.5 | 9.6 | 1793.6 | Thick plate | 159.0 | 1948.3 |
| 4 | 2 | 15 | 8.4 | 2.3 | 183.1 | Thin plate | 106.0 | 722.3 | 25 | 4.4 | 1.5 | 847.3 | Thin plate | 159.0 | 1199.1 |
| 5 | 1 | 15 | 8.4 | 2.3 | 183.1 | Thin plate | 106.0 | 722.3 | 25 | 4.4 | 1.5 | 847.3 | Thin plate | 159.0 | 1199.1 |
| 6 | 2 | 37 | -11.5 | 13.6 | 2126.2 | Thick plate | 159.0 | 1943.3 | 14 | 7.4 | 9.5 | 1784.2 | Thick plate | 159.0 | 1943.3 |
| 7 | 2 | 37 | -11.5 | 13.6 | 2126.2 | Thick plate | 159.0 | 1943.3 | 14 | 7.4 | 9.5 | 1784.2 | Thick plate | 159.0 | 1943.3 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 3 | 2/11/6 | 26/3/10 | (2)FB3044 | |
| 4 | 3/10/0 | 11/6/13 | FB4060 | |
| 4 | 8/10/0 | 6/6/13 | FB4060 | |
| 5 | 6/2/0 | 6/6/13 | FB4060 | |
| 6 | 6/2/0 | 21/6/13 | FB4030 | |
| 6 | 10/10/14 | 26/3/10 | (2)FB3044 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.48 | 11.50 | 1 | 1 | 0.4 | 0.9 | -21.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 10003 | 8.04 | 11.50 | 14 | 14 | 0.3 | -5.1 | 283.5 | 0.0 | 111.3 | 17.8 | 352.3 | 55.9 | 0.81 | 0.29 |
| 10002 | 2.48 | 11.50 | 1 | 1 | 0.3 | -0.8 | -19.3 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 1 | 10.01 | 24.00 | 36 | 15 | -50.6 | 7.0 | -782.6 | 0.0 | 169.5 | 23.6 | 4269.5 | 749.7 | 0.33 | 0.30 |
| 2 | 12.48 | 24.00 | 15 | 36 | 11.9 | -8.2 | 1807.9 | 0.0 | 532.1 | 24.1 | 4966.2 | 1037.8 | 0.38 | 0.34 |
| 3 | 3.59 | 26.92 | 9 | 2 | 1.2 | 15.3 | -1095.4 | 0.0 | 336.3 | 20.8 | 1491.1 | 304.5 | 0.74 | 0.68 |
| 4 | 0.00 | 34.00 | 14 | 23 | 4.3 | 7.0 | -926.4 | 0.0 | 304.8 | 10.7 | 1087.4 | 179.2 | 0.86 | 0.65 |
| 5 | 14.41 | 34.00 | 15 | 37 | 4.3 | -7.7 | -943.4 | 0.0 | 304.8 | 10.7 | 1118.9 | 179.2 | 0.85 | 0.72 |
| 6 | 13.86 | 25.00 | 37 | 1 | -11.5 | -16.7 | -2126.2 | 0.0 | 240.0 | 22.6 | 2971.5 | 304.0 | 0.74 | 0.74 |
| 7 | 12.48 | 24.00 | 37 | 37 | -19.8 | 8.8 | -2126.9 | 0.0 | 445.7 | 24.1 | 5292.5 | 1037.8 | 0.42 | 0.36 |
| 8 | 10.01 | 24.00 | 37 | 24 | -54.8 | 6.6 | -828.1 | 0.0 | 169.5 | 23.6 | 3426.5 | 749.7 | 0.38 | 0.28 |

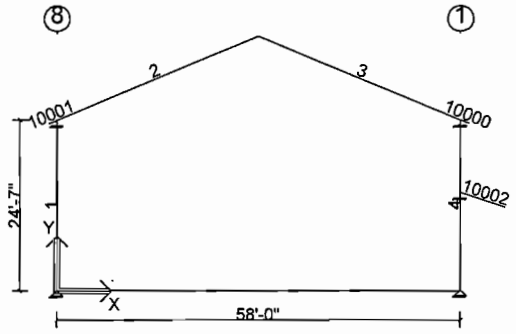
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10003 | 8.04 | 96.45 | 96.4 | 96.4 | 3.37 | 3.37 | 75.43 | 3.91 | 13.12 | 1.56 | 14.77 | 2.39 | 0.03 | 125.05 | 1.00 | 1.00 | 1.13 | 0.85 | 1.00 |
| 10002 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.68 | 1.00 | 1.02 | 0.94 | 0.86 |
| 2 | 12.48 | 269.94 | 269.9 | 269.9 | 16.77 | 16.77 | 1891.85 | 104.18 | 157.65 | 20.84 | 170.35 | 31.45 | 1.68 | 14230.63 | 1.47 | 1.00 | 1.02 | 1.00 | 1.00 |
| 3 | 3.59 | 339.23 | 35.4 | 35.4 | 10.86 | 10.86 | 1318.83 | 18.01 | 98.00 | 6.00 | 110.73 | 9.23 | 0.56 | 3142.66 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |
| 4 | 0.00 | 339.23 | 176.9 | 176.9 | 9.24 | 9.24 | 1573.26 | 11.26 | 92.54 | 3.75 | 108.94 | 5.85 | 0.17 | 3195.26 | 1.01 | 1.00 | 1.00 | 0.96 | 1.00 |
| 5 | 14.41 | 339.23 | 180.0 | 180.0 | 9.24 | 9.24 | 1573.26 | 11.26 | 92.54 | 3.75 | 108.94 | 5.85 | 0.17 | 3195.27 | 1.08 | 1.00 | 1.00 | 0.96 | 1.00 |
| 6 | 13.86 | 339.23 | 35.4 | 35.4 | 10.50 | 10.50 | 1116.50 | 18.01 | 89.32 | 6.00 | 100.50 | 9.21 | 0.55 | 2703.10 | 1.10 | 1.00 | 1.01 | 1.00 | 0.74 |
| 7 | 12.48 | 269.94 | 269.9 | 269.9 | 16.77 | 16.77 | 1891.85 | 104.18 | 157.65 | 20.84 | 170.35 | 31.45 | 1.68 | 14230.63 | 1.34 | 1.00 | 1.02 | 1.00 | 0.84 |
| 8 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.39 | 1.00 | 1.02 | 0.94 | 0.86 |

**User Defined Frame Point Loads for Cross Section: K**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 3 | k | CG | Folding Partition (open)->Resolved From Plane | -0.40 | 24/0/0 | NA | NA | N | DOWN | 1.000 | OF |
| 4 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |

**User Defined Frame Line Loads for Cross Section: K**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | plf | CG | Folding Partition->Resolved From Plane | -15.94 | 2/0/0 | -15.94 | 27/0/0 | N | DOWN | 1.000 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: K**

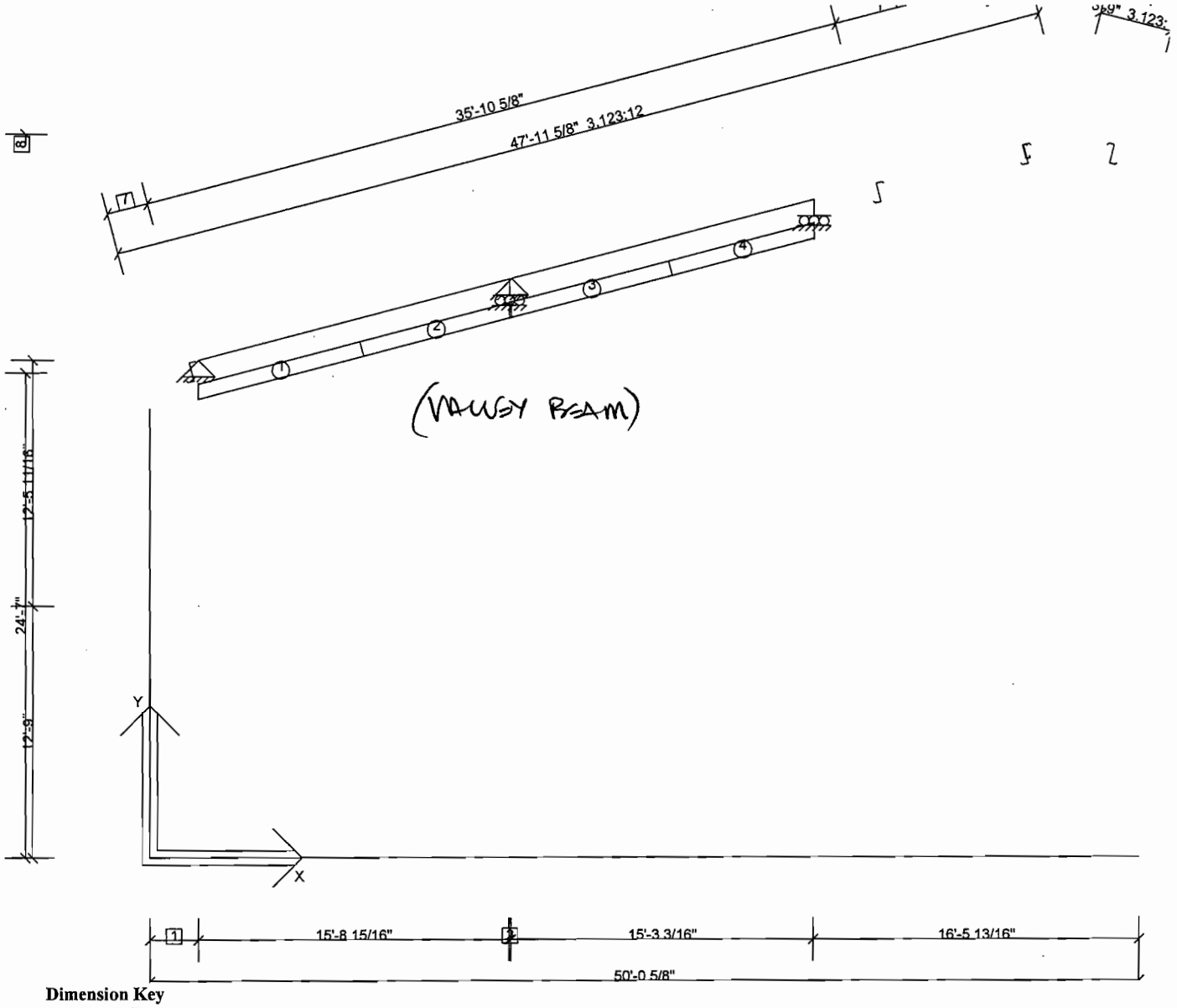
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/205 ) | 1.356 | 2 | 2 | 13 | <W1 |
| Max. Vertical Deflection for Span 1 | ( L/1247 ) | -0.516 | 4 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Wall: 4, Frame at: 81/5/0

Frame Cross Section: 8




**Dimension Key**

1 2'-5 7/16"
2 1 1/4"
3 1'-10"
4 2'-4 11/16"
5 1'-4 5/16"
6 9/16"
7 2'-0 11/16"
8 36'-8" Ridge Ht.

**Frame Clearances**

Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 81/5/0 | 11/9/0 | Valley Beam Left | 38.6598 | | 0/1/0 | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 8.13 | 94.4 | 55.00 | 55.00 | SS | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 8.14 | 86.1 | 55.00 | 55.00 | SS | SS | 3P |
| 3 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 7.89 | 91.8 | 55.00 | 55.00 | SS | SS | 3P |
| 4 | 5.00 | 0.1875 | 0.1345 | 9.00 | 9.00 | 7.89 | 83.5 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 355.8 (p) (Includes all plates)
Frame Pricing Weight = 358.9 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 4 | 33/6/13 | 33/3/14 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 3 | 18/3/10 | 29/4/3 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 3 | 18/2/6 | 29/3/13 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 1 | 2/5/7 | 25/2/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 8**

| Type<br>X-Loc<br>Grid1 - Grid2<br>Base Plate W x L (in.)<br>Base Plate Thickness (in.)<br>Anchor Rod Qty/Diam. (in.)<br>Column Base Elev. | | Rafter<br>2/5/7<br>y=25/2/11 | | Rafter<br>33/6/13<br>y=33/3/14 | | | | |
|---|---|---|---|---|---|---|---|---|
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | - | 0.1 | - | 0.1 | - | - | - |
| FD | Frm | - | - | - | - | - | - | - |
| CG | Frm | - | - | - | 0.5 | - | - | - |
| L> | Frm | - | 0.0 | - | 1.8 | - | - | - |
| <L | Frm | - | 0.0 | - | 1.8 | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | -0.0 | - | -1.8 | - | - | - |
| <W1 | Frm | - | - | - | -1.3 | - | - | - |
| W2> | Frm | - | - | - | -0.8 | - | - | - |
| <W2 | Frm | - | - | - | -0.4 | - | - | - |
| WP | Frm | - | - | - | -0.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | - | - | - | - | - | - | - |
| L | Frm | - | 0.0 | - | 1.8 | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | 0.0 | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/5/7 | 25/2/11 | - | - | - | - | - | - | - | - | - | - | 0.1 | 1 | - | - | - | - |
| 18/2/6 | 29/3/13 | - | - | - | - | - | - | - | - | - | - | 0.1 | 1 | - | - | - | - |
| 18/3/10 | 29/4/3 | - | - | - | - | - | - | - | - | 1.1 | 14 | 2.0 | 1 | - | - | - | - |
| 33/6/13 | 33/3/14 | - | - | - | - | - | - | - | - | 1.7 | 14 | 2.4 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 0.4 | 0.3 |
| FD | 0.0 | 0.0 | 0.0 | 0.0 |
| CG | 0.0 | 0.0 | 0.8 | 0.8 |

| | | | | |
|---|---|---|---|---|
| L> | 0.0 | 0.0 | 3.4 | 3.4 |
| <L | 0.0 | 0.0 | 3.4 | 3.4 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| SD | 0.0 | 0.0 | 0.0 | 0.0 |
| SS | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 1.5 | 0.0 | 3.0 | 3.0 |
| <W1 | 1.1 | 0.0 | 2.2 | 2.2 |
| W2> | 0.7 | 0.0 | 1.4 | 1.4 |
| <W2 | 0.3 | 0.0 | 0.7 | 0.6 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 3.4 | 3.4 |
| E> | 0.1 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.1 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 1 | SIP | 0.375 | 6.00 | 10.30 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 2 | 2 | SIP | 0.375 | 6.00 | 10.30 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 3 | 1 | SIP | 0.375 | 6.00 | 10.30 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 4 | 2 | SIP | 0.375 | 6.00 | 10.30 | 0.500 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 1 | 2 | | 0.1 | 0.0 | | 0.0 | 101.0 | 0 | | 0.0 | 0.0 | | 0.0 | 101.0 |
| 2 | 2 | 52 | | 0.1 | 0.0 | | 0.0 | 101.0 | 6 | | 0.1 | 0.0 | | 0.0 | 101.0 |
| 3 | 1 | 2 | | 1.9 | 0.0 | | 0.0 | 101.0 | 48 | | 0.0 | 0.0 | | 0.0 | 101.0 |
| 4 | 2 | 2 | | 2.3 | 0.0 | | 0.0 | 101.0 | 14 | | 1.7 | 0.0 | | 0.0 | 101.0 |

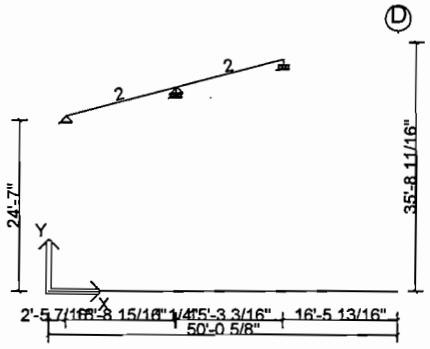
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 8.13 | 9.00 | 1 | 1 | -0.0 | 0.1 | 4.9 | 0.0 | 66.9 | 21.1 | 292.8 | 58.4 | 0.02 | 0.00 |
| 2 | 1.36 | 9.00 | 1 | 1 | 0.0 | -0.1 | 4.8 | 0.0 | 100.2 | 21.1 | 110.5 | 58.4 | 0.04 | 0.00 |
| 3 | 7.89 | 9.00 | 1 | 1 | -0.0 | 1.9 | 106.0 | 0.0 | 16.4 | 21.1 | 116.4 | 58.4 | 0.83 | 0.09 |
| 4 | 1.31 | 9.00 | 1 | 1 | 0.1 | -2.3 | 105.4 | 0.0 | 100.2 | 21.1 | 116.5 | 58.4 | 0.91 | 0.11 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.13 | 195.23 | 195.2 | 195.2 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.14 | 1.00 | 1.11 | 0.88 | 0.90 |
| 2 | 1.36 | 195.23 | 195.2 | 195.2 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.14 | 1.00 | 1.11 | 0.88 | 1.00 |
| 3 | 7.89 | 189.29 | 189.3 | 189.3 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.14 | 1.00 | 1.11 | 0.88 | 1.00 |
| 4 | 1.31 | 189.29 | 189.3 | 189.3 | 3.04 | 3.04 | 43.60 | 3.91 | 9.69 | 1.56 | 10.76 | 2.38 | 0.03 | 75.87 | 1.14 | 1.00 | 1.11 | 0.88 | 1.00 |

**User Defined Frame Line Loads for Cross Section: 8**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | CG | | -84.00 | 13/8/10 | -30.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | L | | -335.00 | 13/8/10 | -118.00 | 28/9/15 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | | 295.00 | 13/8/10 | 104.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W1 | | 221.00 | 13/8/10 | 78.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | W2> | | 139.00 | 13/8/10 | 49.00 | 28/9/15 | N | UP | 1.000 | OF |
| 2 | plf | <W2 | | 65.00 | 13/8/10 | 23.00 | 28/9/15 | N | UP | 1.000 | OF |




**Deflection Load Combinations - Framing**

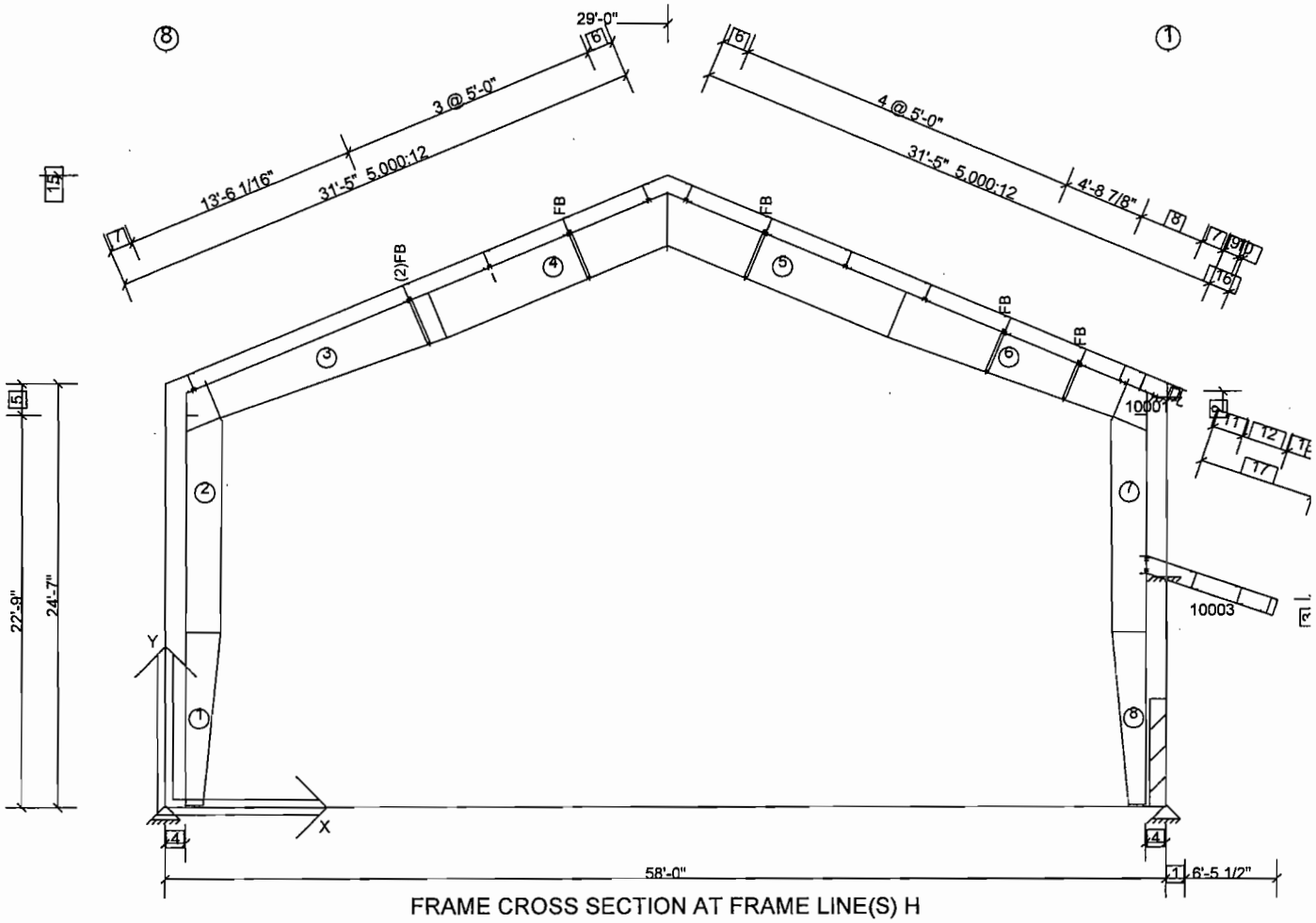
| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 8**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/99999 ) | -0.002 | 2 | 1 | 1 | L |
| Max. Vertical Deflection for Span 2 | ( L/786 ) | -0.233 | 3 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 95/8/0**
Frame Cross Section: H




FRAME CROSS SECTION AT FRAME LINE(S) H

**Dimension Key**

1 1'-1 1/2"
2 24'-1 3/8"
3 12'-0"
4 1'-2"
5 1'-10"
6 1'-6 13/16"
7 1'-4 3/16"
8 3'-9 3/16"
9 11 5/8"
10 3"
11 1'-9 13/16"
12 2'-9 3/16"
13 1'-10 3/16"
14 4 1/2"
15 36'-8" Ridge Ht.
16 1'-2 5/8" 5.000:12
17 6'-9 11/16" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX107) and 7(CX108): 51'-6 3/4"
Horiz. Clearance between members 1(CX107) and 8(CX108): 51'-8"
Horiz. Clearance between members 2(CX107) and 7(CX108): 51'-5 5/8"
Horiz. Clearance between members 2(CX107) and 8(CX108): 51'-6 7/8"
Vert. Clearance at member 2(CX107): 22'-4 5/8"
Vert. Clearance at member 7(CX108): 22'-4 5/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 95/8/0 | 18/9/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 10003 | 5.00 | 0.1875 | 0.1345 | 11.50 | 11.50 | 8.04 | 104.0 | 55.00 | 55.00 | SS | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.5 | 55.00 | 55.00 | BP | SS | 3P |
| 2 | 10.00 | 0.6250 | 0.1875 | 24.00 | 24.00 | 13.91 | 841.0 | 55.00 | 55.00 | SS | KN | 3P |
| 3 | 6.00 | 0.5000 | 0.1875 | 25.00 | 34.00 | 15.15 | 565.8 | 55.00 | 55.00 | KN | SS | 3P |
| 4 | 6.00 | 0.3750 | 0.1644 | 34.00 | 34.00 | 15.00 | 512.8 | 55.00 | 55.00 | SS | SP | 3P |
| 5 | 6.00 | 0.3750 | 0.1644 | 34.00 | 34.00 | 15.00 | 512.8 | 55.00 | 55.00 | SP | SS | 3P |
| 6 | 6.00 | 0.5000 | 0.1875 | 34.00 | 25.00 | 15.15 | 566.6 | 55.00 | 55.00 | SS | KN | 3P |
| 7 | 10.00 | 0.6250 | 0.1875 | 24.00 | 24.00 | 13.90 | 842.2 | 55.00 | 55.00 | SS | KN | 3P |
| 8 | 10.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 10.00 | 463.6 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 4906.7 (p) (Includes all plates)
Frame Pricing Weight = 5091.5 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 58/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 58/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10003 | 58/0/0 | 14/1/13 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: H**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | H-8 | | H-1 | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | 11 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.9 | 5.0 | -0.9 | 6.3 | - | - | - |
| FD | Frm | 0.2 | 12.7 | -0.2 | 12.7 | - | - | - |
| CG | Frm | 1.1 | 4.2 | -1.1 | 4.8 | - | - | - |
| L> | Frm | 4.2 | 16.8 | -4.2 | 18.9 | - | - | - |
| <L | Frm | 4.2 | 16.8 | -4.2 | 18.9 | - | - | - |
| S> | Frm | 0.4 | 1.5 | -0.4 | 2.2 | - | - | - |
| <S | Frm | 0.4 | 1.5 | -0.4 | 2.2 | - | - | - |
| S | Frm | 0.4 | 1.5 | -0.4 | 2.2 | - | - | - |
| SD | Frm | -0.2 | -0.2 | 0.2 | 2.2 | - | - | - |
| SS | Frm | -0.0 | -0.0 | 0.0 | 0.2 | - | - | - |
| US1* | Frm | 0.5 | 1.9 | -0.5 | 1.2 | - | - | - |
| *US1 | Frm | 0.5 | 1.2 | -0.5 | 2.0 | - | - | - |
| W1> | Frm | 5.9 | -9.8 | 9.8 | -21.7 | - | - | - |
| <W1 | Frm | -11.4 | -16.5 | -6.2 | -10.4 | - | - | - |
| W2> | Frm | 4.9 | -1.8 | 10.5 | -14.5 | - | - | - |
| <W2 | Frm | -12.4 | -8.7 | -5.5 | -3.2 | - | - | - |
| WP | Frm | 3.2 | -11.4 | -3.9 | -13.5 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.5 | 25.4 | -0.5 | 25.4 | - | - | - |
| L | Frm | 4.2 | 16.8 | -4.2 | 18.9 | - | - | - |
| E> | Frm | 2.3 | 1.2 | 2.1 | -1.2 | - | - | - |
| EG+ | Frm | 0.0 | 0.5 | -0.0 | 0.6 | - | - | - |
| <E | Frm | -2.3 | -1.2 | -2.1 | 1.2 | - | - | - |
| EG- | Frm | -0.0 | -0.5 | 0.0 | -0.6 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | H-8 | 11.7 | 17 | 10.1 | 34 | - | - | - | - | 5.9 | 15 | 53.6 | 31 | - | - | - | - |
| 58/0/0 | H-1 | 10.4 | 35 | 9.8 | 16 | - | - | - | - | 10.3 | 14 | 57.0 | 31 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |

| | | | | |
|---|---|---|---|---|
| D | 0.0 | 0.0 | 11.6 | 11.3 |
| FD | 0.0 | 0.0 | 25.4 | 25.4 |
| CG | 0.0 | 0.0 | 9.0 | 9.0 |
| L> | 0.0 | 0.0 | 35.8 | 35.8 |
| <L | 0.0 | 0.0 | 35.8 | 35.8 |
| S> | 0.0 | 0.0 | 3.7 | 3.7 |
| <S | 0.0 | 0.0 | 3.7 | 3.7 |
| S | 0.0 | 0.0 | 3.7 | 3.7 |
| SD | 0.0 | 0.0 | 2.1 | 2.1 |
| SS | 0.0 | 0.0 | 0.1 | 0.1 |
| US1* | 0.0 | 0.0 | 3.1 | 3.1 |
| *US1 | 0.0 | 0.0 | 3.2 | 3.2 |
| W1> | 17.3 | 15.6 | 31.1 | 31.5 |
| <W1 | 16.1 | 17.6 | 26.6 | 26.9 |
| W2> | 16.0 | 15.4 | 16.1 | 16.3 |
| <W2 | 17.3 | 17.9 | 11.7 | 11.8 |
| WP | 0.7 | 0.7 | 24.9 | 24.9 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 50.8 | 50.8 |
| L | 0.0 | 0.0 | 35.8 | 35.8 |
| E> | 4.4 | 4.4 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 1.1 | 1.1 |
| <E | 4.4 | 4.4 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 1.1 | 1.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | H-8 | 1 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 58/0/0 | H-1 | 8 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | S9 | 11.67 | 23.849 | 127.19 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 2 | *** | MUST | Use | Alternate | Web | Thick.= | 0.3125 | * | * | * | * |
| 7 | 1 | S9 | 11.67 | 23.989 | 127.94 | N/A | N/A | 0.5000 | 4.500 | Both | W-OS-0.1875 |
| 7 | *** | MUST | Use | Alternate | Web | Thick.= | 0.3125 | * | * | * | * |
| 7 | 3 | S5 | 4.39 | 23.216 | 123.82 | N/A | N/A | 0.1875 | 4.750 | Both | W-OS-0.1875 |
| 7 | 4 | S5 | 3.40 | 23.111 | 123.26 | N/A | N/A | 0.1875 | 4.750 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1000 | 2 | CIP | 0.500 | 6.00 | 13.12 | 0.500 | A325N/ST | 3.00 | 12 | Flush | 1.50 | 12 | Flush | 1.50 |
| 3 | | | | | | | | | | | | | | |
| 2 | 2 | KN(Face) | 0.625 | 10.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |
| 3 | 1 | KN(Face) | 0.625 | 6.00 | 30.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.75 | 31 | Extended | 3.75 |
| 4 | 2 | SP | 0.375 | 6.00 | 40.83 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 4.00 |
| 5 | 1 | SP | 0.375 | 6.00 | 40.83 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 4.00 |
| 6 | 2 | KN(Face) | 0.625 | 6.00 | 31.50 | 0.875 | A325X/ST | 3.50 | 31 | Extended | 4.00 | 31 | Extended | 4.00 |
| 7 | 2 | KN(Face) | 0.625 | 10.00 | 31.50 | 0.875 | A325X/ST | 3.50 | 31 | Extended | 4.00 | 31 | Extended | 4.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1000 | 2 | 1 | 1.6 | 4.7 | 266.9 | Thick plate | 56.5 | 345.7 | 14 | 0.2 | 5.1 | 280.0 | Thick plate | 56.5 | 345.7 |
| 3 | | | | | | | | | | | | | | | |
| 2 | 2 | 36 | -12.6 | 14.7 | 1975.0 | Thick plate | 159.0 | 1948.3 | 15 | 8.5 | 11.6 | 1886.9 | Thick plate | 159.0 | 1948.3 |
| 3 | 1 | 36 | -12.6 | 14.7 | 1975.0 | Thick plate | 159.0 | 1948.3 | 15 | 8.5 | 11.6 | 1886.9 | Thick plate | 159.0 | 1948.3 |
| 4 | 2 | 15 | 8.4 | 0.8 | 323.2 | Thin plate | 106.0 | 720.9 | 25 | 4.7 | 0.5 | 1023.9 | Thin plate | 159.0 | 1197.4 |
| 5 | 1 | 15 | 8.4 | 0.8 | 323.2 | Thin plate | 106.0 | 720.9 | 25 | 4.7 | 0.5 | 1023.9 | Thin plate | 159.0 | 1197.4 |
| 6 | 2 | 37 | -12.3 | 14.0 | 2293.9 | Thin plate | 216.5 | 2145.0 | 14 | 8.6 | 10.4 | 1966.5 | Thin plate | 216.5 | 2145.0 |
| 7 | 2 | 37 | -12.3 | 14.0 | 2293.9 | Thin plate | 216.5 | 2145.0 | 14 | 8.6 | 10.4 | 1966.5 | Thin plate | 216.5 | 2145.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 3 | 12/8/4 | 16/6/13 | (2)FB4050 | |
| 4 | 8/10/0 | 6/6/13 | FB4054 | |
| 5 | 6/2/0 | 6/6/13 | FB4054 | |
| 6 | 6/2/0 | 21/6/13 | FB4030 | |
| 6 | 10/10/14 | 26/3/10 | FB3044 | |

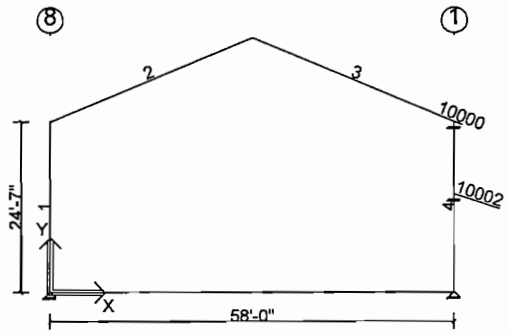
**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.48 | 11.50 | 1 | 1 | 0.4 | 0.8 | -20.7 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.10 | 0.05 |
| 10003 | 8.04 | 11.50 | 14 | 14 | 0.2 | -5.1 | 280.0 | 0.0 | 111.3 | 17.8 | 352.3 | 55.9 | 0.80 | 0.28 |
| 1 | 10.01 | 24.00 | 36 | 15 | -52.9 | 7.4 | -834.8 | 0.0 | 169.5 | 23.6 | 4281.3 | 749.7 | 0.35 | 0.31 |
| 2 | 12.48 | 24.00 | 36 | 36 | -20.8 | -8.7 | -1998.0 | 0.0 | 445.7 | 24.1 | 5292.5 | 1037.8 | 0.40 | 0.36 |
| 3 | 0.64 | 25.00 | 36 | 2 | -12.6 | 19.1 | -1975.0 | 0.0 | 240.0 | 22.6 | 2971.5 | 304.0 | 0.69 | 0.85 |
| 4 | 5.74 | 34.00 | 1 | 2 | -8.8 | 8.3 | 1408.1 | 0.0 | 192.6 | 10.8 | 3137.0 | 230.2 | 0.47 | 0.77 |
| 5 | 14.41 | 34.00 | 15 | 1 | 5.3 | -8.7 | -908.8 | 0.0 | 328.9 | 10.8 | 1291.8 | 230.2 | 0.71 | 0.81 |
| 6 | 13.86 | 25.00 | 37 | 1 | -12.3 | -17.6 | -2293.9 | 0.0 | 240.0 | 22.6 | 2971.5 | 304.0 | 0.80 | 0.78 |
| 7 | 12.48 | 24.00 | 37 | 37 | -20.4 | 9.4 | -2291.0 | 0.0 | 445.7 | 24.1 | 5292.5 | 1037.8 | 0.46 | 0.39 |
| 8 | 10.01 | 24.00 | 37 | 24 | -55.4 | 7.2 | -902.9 | 0.0 | 169.5 | 23.6 | 3427.8 | 749.7 | 0.40 | 0.30 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10003 | 8.04 | 96.45 | 96.4 | 96.4 | 3.37 | 3.37 | 75.43 | 3.91 | 13.12 | 1.56 | 14.77 | 2.39 | 0.03 | 125.05 | 1.00 | 1.00 | 1.13 | 0.85 | 1.00 |
| 1 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.68 | 1.00 | 1.02 | 0.94 | 0.86 |
| 2 | 12.48 | 269.94 | 269.9 | 269.9 | 16.77 | 16.77 | 1891.85 | 104.18 | 157.65 | 20.84 | 170.35 | 31.45 | 1.68 | 14230.63 | 1.68 | 1.00 | 1.02 | 1.00 | 0.84 |
| 3 | 0.64 | 339.23 | 16.5 | 16.5 | 10.50 | 10.50 | 1116.50 | 18.01 | 89.32 | 6.00 | 100.50 | 9.21 | 0.55 | 2703.11 | 1.00 | 1.00 | 1.01 | 1.00 | 0.74 |
| 4 | 5.74 | 339.23 | 120.0 | 60.0 | 9.97 | 9.97 | 1775.63 | 13.51 | 104.45 | 4.50 | 121.09 | 6.97 | 0.26 | 3819.39 | 1.09 | 1.00 | 1.00 | 1.00 | 0.60 |
| 5 | 14.41 | 339.23 | 180.0 | 180.0 | 9.97 | 9.97 | 1775.64 | 13.51 | 104.45 | 4.50 | 121.09 | 6.97 | 0.26 | 3819.39 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 |
| 6 | 13.86 | 339.23 | 35.4 | 35.4 | 10.50 | 10.50 | 1116.50 | 18.01 | 89.32 | 6.00 | 100.50 | 9.21 | 0.55 | 2703.10 | 1.09 | 1.00 | 1.01 | 1.00 | 0.74 |
| 7 | 12.48 | 269.94 | 269.9 | 269.9 | 16.77 | 16.77 | 1891.85 | 104.18 | 157.65 | 20.84 | 170.35 | 31.45 | 1.68 | 14230.63 | 1.35 | 1.00 | 1.02 | 1.00 | 0.84 |
| 8 | 10.01 | 269.94 | 269.9 | 269.9 | 14.31 | 14.31 | 1570.94 | 83.35 | 130.91 | 16.67 | 142.30 | 25.20 | 0.88 | 11506.95 | 1.39 | 1.00 | 1.02 | 0.94 | 0.86 |

**User Defined Frame Point Loads for Cross Section: H**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz | -25.40 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -12.70 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: H**

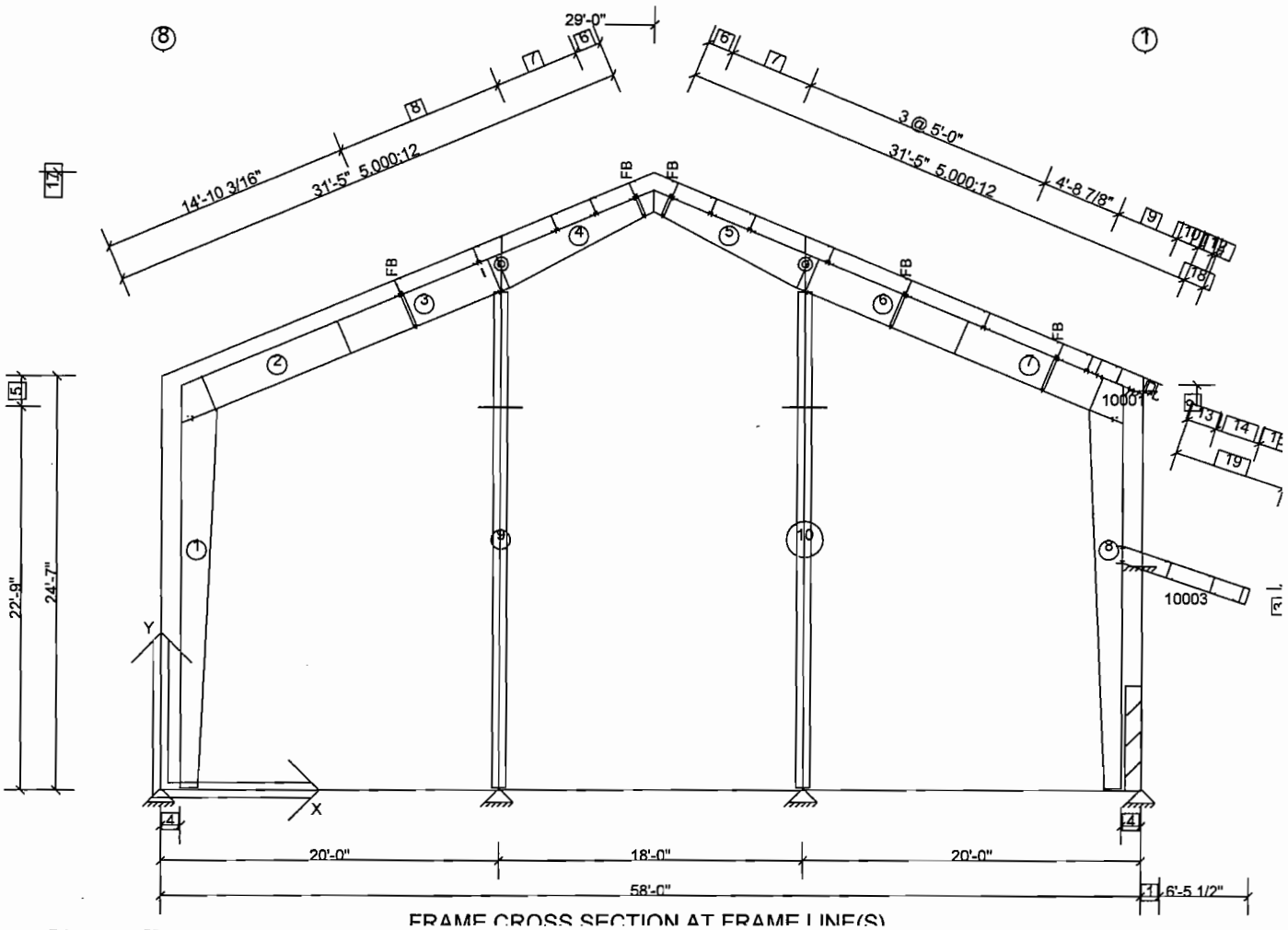
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/193 ) | -1.436 | 7 | 2 | 12 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/1053 ) | -0.611 | 4 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 118/11/0**

Frame Cross Section:




FRAME CROSS SECTION AT FRAME LINE(S)

**Dimension Key**

1 1'-1 1/2"
2 24'-1 3/8"
3 12'-0"
4 1'-2"
5 1'-10"
6 1'-6 13/16"
7 2 @ 2'-6"
8 2 @ 5'-0"
9 2 @ 1'-10 9/16"
10 1'-4 3/16"
11 11 5/8"
12 3"
13 1'-9 13/16"
14 2'-9 3/16"
15 1'-10 3/16"
16 4 1/2"
17 36'-8" Ridge Ht.
18 1'-2 5/8" 5.000:12
19 6'-9 11/16" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX109) and 8(CX110): 51'-6 3/4"
Vert. Clearance at member 1(CX109): 22'-4 3/4"
Vert. Clearance at member 8(CX110): 22'-6 13/16"
Vert. Clearance at member 9(EPX102): 29'-7 7/16"
Vert. Clearance at member 10(EPX103): 29'-7 7/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 118/11/0 | 13/2/8 | CB2 End | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.69 | 34.3 | 55.00 | 55.00 | SS | SS | 3P |
| 10003 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 8.04 | 86.8 | 55.00 | 55.00 | SS | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 23.91 | 960.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.3750 | 0.1644 | 25.00 | 25.00 | 9.95 | 250.3 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.2500 | 0.1345 | 25.00 | 25.00 | 10.13 | 199.7 | 55.00 | 55.00 | SS | SS | 3P |
| 4 | 5.00 | 0.2500 | 0.1345 | 25.00 | 14.00 | 10.08 | 178.5 | 55.00 | 55.00 | SS | SP | 3P |
| 5 | 5.00 | 0.2500 | 0.1345 | 14.00 | 25.00 | 10.08 | 178.5 | 55.00 | 55.00 | SP | SS | 3P |
| 6 | 5.00 | 0.2500 | 0.1345 | 25.00 | 25.00 | 10.11 | 199.4 | 55.00 | 55.00 | SS | SS | 3P |
| 7 | 5.00 | 0.3750 | 0.1644 | 25.00 | 25.00 | 9.96 | 248.8 | 55.00 | 55.00 | SS | KN | 3P |
| 8 | 8.00 | 0.5000 | 0.1875 | 12.00 | 24.00 | 23.91 | 953.7 | 55.00 | 55.00 | BP | KN | 3P |
| 9 | 10.00 | 0.3750 | 0.1644 | 12.00 | 12.00 | 29.50 | 969.4 | 55.00 | 55.00 | BP | CP | 3P |
| 10 | 10.00 | 0.3750 | 0.1644 | 12.00 | 12.00 | 29.50 | 969.4 | 55.00 | 55.00 | BP | CP | 3P |

Total Frame Weight = 5229.8 (p) (Includes all plates)
Frame Pricing Weight = 5408.0 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 9 | No | Yes |
| 10 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 58/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 9 | 20/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10 | 38/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 58/0/0 | 24/7/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10003 | 58/0/0 | 14/1/13 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Exterior Column | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
| Grid1 - Grid2 | | -8 | | D-5 | | | D-3 | | | -1 | | |
| Base Plate W x L (in.) | | 9 x 13 | | 11 x 13 | | | 11 x 13 | | | 9 x 13 | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |
| D | Frm | 0.0 | 1.5 | - | -0.0 | 4.1 | - | -0.0 | 3.4 | -0.0 | 2.7 | - |
| FD | Frm | 0.1 | 7.1 | - | 0.2 | 11.8 | - | 0.2 | 12.8 | -0.1 | 8.1 | - |
| CG | Frm | 0.0 | 0.8 | - | -0.0 | 3.7 | - | -0.0 | 2.3 | -0.0 | 1.4 | - |
| L> | Frm | 0.1 | 3.1 | - | -0.1 | 14.8 | - | -0.1 | 9.2 | -0.1 | 5.7 | - |
| <L | Frm | 0.1 | 3.1 | - | -0.1 | 14.8 | - | -0.1 | 9.2 | -0.1 | 5.7 | - |
| S> | Frm | - | 0.3 | - | - | 1.2 | - | - | 1.1 | - | 0.8 | - |
| <S | Frm | - | 0.3 | - | - | 1.2 | - | - | 1.1 | - | 0.8 | - |
| S | Frm | - | 0.3 | - | - | 1.2 | - | - | 1.1 | - | 0.8 | - |
| SD | Frm | -0.1 | -0.2 | - | -0.0 | 3.0 | - | -0.0 | 2.5 | 0.1 | 1.5 | - |
| SS | Frm | - | -0.0 | - | - | 0.0 | - | - | -0.0 | - | 0.1 | - |
| US1* | Frm | - | 0.2 | - | - | 1.1 | - | - | 0.5 | - | 0.1 | - |
| *US1 | Frm | - | 0.0 | - | - | 0.5 | - | - | 1.1 | - | 0.3 | - |
| W1> | Frm | 6.7 | 1.7 | - | 0.9 | -19.0 | - | 0.9 | 0.4 | 6.0 | -12.2 | - |
| <W1 | Frm | -7.1 | -9.1 | - | 0.7 | -0.5 | - | 0.7 | -13.4 | -7.8 | 0.6 | - |
| W2> | Frm | 5.2 | 5.7 | - | -0.2 | -15.8 | - | -0.2 | 2.4 | 8.3 | -9.1 | - |
| <W2 | Frm | -8.5 | -5.1 | - | 0.5 | 2.6 | - | 0.5 | -11.4 | -5.5 | 3.6 | - |
| WP | Frm | 2.9 | -9.0 | - | -1.2 | -1.8 | - | -1.2 | -4.6 | -5.5 | -9.1 | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 14.4 | - | 0.4 | 23.6 | - | 0.4 | 23.6 | -0.2 | 14.4 | - |
| L | Frm | 0.1 | 3.1 | - | -0.1 | 14.8 | - | -0.1 | 9.2 | -0.1 | 5.7 | - |
| E> | Frm | 1.6 | 1.4 | - | 1.8 | -1.8 | - | 1.8 | 2.1 | 1.5 | -1.6 | - |
| EG+ | Frm | - | 0.2 | - | - | 0.5 | - | - | 0.4 | - | 0.3 | - |
| <E | Frm | -1.6 | -1.4 | - | -1.8 | 1.8 | - | -1.8 | -2.1 | -1.5 | 1.6 | - |
| EG- | Frm | - | -0.2 | - | - | -0.5 | - | - | -0.4 | - | -0.3 | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) | Load Case | Hrz Right (Hx) | Load Case | Hrz In (-Hz) | Load Case | Hrz Out (Hz) | Load Case | Uplift (-Vy) | Load Case | Vrt Down (Vy) | Load Case | Mom cw (-Mzz) | Load Case | Mom ccw (Mzz) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | (k) | | (k) | | (k) | | (k) | | (k) | | (k) | | (in-k) | | (in-k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -8 | 8.4 | 17 | 6.8 | 9 | - | - | - | - | 3.9 | 15 | 26.8 | 36 | - | - | - | - |
| 20/0/0 | D-5 | - | - | - | - | 1.1 | 48 | 1.4 | 45 | 9.5 | 14 | 50.3 | 37 | - | - | - | - |
| 38/0/0 | D-3 | - | - | - | - | 1.1 | 48 | 1.4 | 45 | 3.7 | 15 | 44.9 | 36 | - | - | - | - |
| 58/0/0 | -1 | 7.9 | 10 | 8.2 | 16 | - | - | - | - | 5.7 | 14 | 30.0 | 37 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 12.0 | 11.7 |
| FD | 0.0 | 0.0 | 39.8 | 39.8 |
| CG | 0.0 | 0.0 | 8.2 | 8.2 |
| L> | 0.0 | 0.0 | 32.7 | 32.7 |
| <L | 0.0 | 0.0 | 32.7 | 32.7 |
| S> | 0.0 | 0.0 | 3.4 | 3.4 |
| <S | 0.0 | 0.0 | 3.4 | 3.4 |
| S | 0.0 | 0.0 | 3.4 | 3.4 |
| SD | 0.0 | 0.0 | 6.7 | 6.7 |
| SS | 0.0 | 0.0 | 0.1 | 0.1 |
| US1* | 0.0 | 0.0 | 1.9 | 1.9 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 14.4 | 12.6 | 28.7 | 29.1 |
| <W1 | 13.3 | 14.8 | 22.1 | 22.5 |
| W2> | 14.2 | 13.5 | 16.6 | 16.8 |
| <W2 | 13.4 | 14.0 | 10.2 | 10.3 |
| WP | 2.6 | 2.6 | 24.5 | 24.5 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| FL | 0.0 | 0.0 | 76.0 | 76.0 |
| L | 0.0 | 0.0 | 32.7 | 32.7 |
| E> | 3.1 | 3.1 | 0.2 | 0.2 |
| EG+ | 0.0 | 0.0 | 1.4 | 1.4 |
| <E | 3.1 | 3.1 | 0.2 | 0.2 |
| EG- | 0.0 | 0.0 | 1.4 | 1.4 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -8 | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 20/0/0 | D-5 | 9 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 38/0/0 | D-3 | 10 | 0.375 | 11 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 58/0/0 | -1 | 8 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 21.64 | 23.750 | 126.67 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 3 | 1 | S2 | 9.59 | 24.500 | 182.16 | N/A | N/A | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 6 | 1 | S2 | 0.54 | 24.500 | 182.16 | N/A | N/A | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 8 | 1 | S9 | 21.64 | 22.816 | 121.68 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 8 | 2 | S5 | 14.36 | 18.850 | 100.53 | N/A | N/A | 0.1875 | 3.500 | Both | W-OS-0.1875 |
| 8 | 3 | S5 | 13.36 | 18.305 | 97.63 | N/A | N/A | 0.1875 | 3.500 | Both | W-OS-0.1875 |
| 9 | 1 | S2 | 21.76 | 11.250 | 68.43 | N/A | N/A | 0.1875 | 4.750 | Both | F-BS-0.1875,W-OS-0.1875 |
| 10 | 1 | S2 | 21.76 | 11.250 | 68.43 | N/A | N/A | 0.1875 | 4.750 | Both | F-BS-0.1875,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1000 | 2 | CIP | 0.375 | 6.00 | 13.12 | 0.500 | A325N/ST | 3.00 | 11 | Flush | 1.50 | 11 | Flush | 1.50 |
| 3 | | | | | | | | | | | | | | |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 28.25 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 28.25 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 31 | Extended | 3.50 |
| 4 | 2 | SP | 0.375 | 6.00 | 16.21 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 5 | 1 | SP | 0.375 | 6.00 | 16.21 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 7 | 2 | KN(Face) | 0.500 | 6.00 | 26.00 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 12 | Flush | 2.00 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 2 | KN(Face) | 0.500 | 8.00 | 26.00 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 12 | Flush | 2.00 |
| 9 | 2 | CP | 0.375 | 11.00 | 13.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 3.00 | 11 | Flush | 3.00 |
| 10 | 2 | CP | 0.375 | 11.00 | 13.00 | 0.500 | A325/ | 3.00 | 11 | Flush | 3.00 | 11 | Flush | 3.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1000 | 2 | 1 | 1.0 | 2.9 | 166.6 | Thick plate | 37.7 | 186.6 | 14 | 0.2 | 3.1 | 173.0 | Thick plate | 37.7 | 186.6 |
| 3 | | | | | | | | | | | | | | | |
| 1 | 2 | 11 | -5.1 | 5.7 | 992.0 | Thin plate | 159.0 | 976.0 | 10 | 4.5 | 6.6 | 1012.8 | Thin plate | 159.0 | 1357.1 |
| 2 | 1 | 11 | -5.1 | 5.7 | 992.0 | Thin plate | 159.0 | 976.0 | 10 | 4.5 | 6.6 | 1012.8 | Thin plate | 159.0 | 1357.1 |
| 4 | 2 | 16 | -0.0 | 2.6 | 32.1 | Thin plate | 106.0 | 247.5 | 13 | 8.3 | 4.2 | 181.6 | Thin plate | 106.0 | 263.1 |
| 5 | 1 | 16 | -0.0 | 2.6 | 32.1 | Thin plate | 106.0 | 247.5 | 13 | 8.3 | 4.2 | 181.6 | Thin plate | 106.0 | 263.1 |
| 7 | 2 | 12 | -4.2 | 5.6 | 982.1 | Thin plate | 159.0 | 969.1 | 14 | 3.5 | 6.6 | 902.9 | Thin plate | 159.0 | 969.1 |
| 8 | 2 | 12 | -4.2 | 5.6 | 982.1 | Thin plate | 159.0 | 969.1 | 14 | 3.5 | 6.6 | 902.9 | Thin plate | 159.0 | 969.1 |
| 9 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| 10 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 3 | 4/0/7 | 16/6/13 | FB3030 | |
| 4 | 8/10/15 | 1/6/13 | FB2080 | |
| 5 | 1/2/0 | 1/6/13 | FB2080 | |
| 6 | 6/1/1 | 16/6/13 | FB3030 | |
| 7 | 5/8/9 | 26/3/10 | FB3030 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.48 | 11.50 | 1 | 1 | 0.2 | 0.5 | -13.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 10003 | 8.04 | 11.50 | 14 | 14 | 0.2 | -3.1 | 173.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.85 | 0.18 |
| 1 | 14.99 | 20.00 | 12 | 18 | 3.0 | 5.0 | 865.7 | 0.0 | 381.6 | 28.8 | 1421.3 | 533.5 | 0.61 | 0.21 |
| 2 | 0.63 | 25.00 | 16 | 15 | -4.6 | -7.2 | -963.6 | 0.0 | 50.8 | 14.9 | 1051.2 | 160.1 | 0.93 | 0.48 |
| 3 | 10.02 | 25.00 | 35 | 37 | 5.3 | -7.5 | -363.2 | 0.0 | 191.2 | 8.0 | 481.2 | 95.6 | 0.77 | 0.94 |
| 4 | 0.00 | 25.00 | 37 | 1 | -4.1 | 8.2 | -329.8 | 0.0 | 24.2 | 8.0 | 447.2 | 95.6 | 0.71 | 1.02 |
| 5 | 9.96 | 25.00 | 9 | 21 | 1.3 | -3.6 | -245.6 | 0.0 | 191.2 | 8.0 | 441.2 | 95.6 | 0.56 | 0.45 |
| 6 | 0.00 | 25.00 | 34 | 15 | 3.7 | -6.9 | -264.5 | 0.0 | 191.2 | 8.0 | 478.1 | 95.6 | 0.56 | 0.86 |
| 7 | 8.67 | 25.00 | 12 | 37 | -4.2 | -6.9 | -982.1 | 0.0 | 170.0 | 14.9 | 1604.2 | 160.1 | 0.62 | 0.46 |
| 8 | 14.99 | 20.00 | 11 | 18 | 3.1 | -4.8 | 926.0 | 0.0 | 381.6 | 28.8 | 1518.6 | 533.5 | 0.61 | 0.20 |
| 9 | 12.38 | 12.00 | 38 | 13 | -47.5 | -3.7 | 258.7 | 0.0 | 75.1 | 32.2 | 898.1 | 458.4 | 0.72 | 0.11 |
| 10 | 12.38 | 12.00 | 36 | 13 | -45.7 | -3.7 | 118.0 | 0.0 | 75.1 | 32.2 | 840.2 | 458.4 | 0.63 | 0.11 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.48 | 29.79 | 29.8 | 29.8 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10003 | 8.04 | 96.45 | 96.4 | 96.4 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 14.99 | 269.86 | 269.9 | 269.9 | 11.56 | 11.56 | 867.84 | 42.68 | 86.78 | 10.67 | 94.92 | 16.17 | 0.71 | 4056.99 | 1.17 | 1.00 | 1.06 | 1.00 | 1.00 |
| 2 | 0.63 | 224.03 | 16.2 | 16.2 | 7.74 | 7.74 | 763.91 | 7.82 | 61.11 | 3.13 | 70.34 | 4.85 | 0.21 | 1185.72 | 1.00 | 1.00 | 1.00 | 1.00 | 0.79 |
| 3 | 10.02 | 224.03 | 180.1 | 180.1 | 5.80 | 5.80 | 547.70 | 5.21 | 43.82 | 2.09 | 51.12 | 3.24 | 0.07 | 798.37 | 1.30 | 1.00 | 1.00 | 0.94 | 1.00 |
| 4 | 0.00 | 119.50 | 180.1 | 180.1 | 5.80 | 5.80 | 547.70 | 5.21 | 43.82 | 2.09 | 51.12 | 3.24 | 0.07 | 798.37 | 1.31 | 1.00 | 1.00 | 0.94 | 0.78 |
| 5 | 9.96 | 119.50 | 180.1 | 180.1 | 5.80 | 5.80 | 547.70 | 5.21 | 43.82 | 2.09 | 51.12 | 3.24 | 0.07 | 798.37 | 1.27 | 1.00 | 1.00 | 0.94 | 1.00 |
| 6 | 0.00 | 224.03 | 180.1 | 180.1 | 5.80 | 5.80 | 547.70 | 5.21 | 43.82 | 2.09 | 51.12 | 3.24 | 0.07 | 798.37 | 1.32 | 1.00 | 1.00 | 0.94 | 1.00 |
| 7 | 8.67 | 224.03 | 35.4 | 35.4 | 7.74 | 7.74 | 763.91 | 7.82 | 61.11 | 3.13 | 70.34 | 4.85 | 0.21 | 1185.73 | 1.09 | 1.00 | 1.00 | 1.00 | 0.67 |
| 8 | 14.99 | 269.86 | 269.9 | 269.9 | 11.56 | 11.56 | 867.84 | 42.68 | 86.78 | 10.67 | 94.92 | 16.17 | 0.71 | 4056.99 | 1.25 | 1.00 | 1.06 | 1.00 | 1.00 |
| 9 | 12.38 | 367.47 | 354.0 | 354.0 | 9.35 | 9.35 | 272.98 | 62.50 | 45.50 | 12.50 | 48.80 | 18.83 | 0.37 | 2111.71 | 1.32 | 1.00 | 1.07 | 0.87 | 1.00 |
| 10 | 12.38 | 367.47 | 354.0 | 354.0 | 9.35 | 9.35 | 272.98 | 62.50 | 45.50 | 12.50 | 48.80 | 18.83 | 0.37 | 2111.71 | 1.24 | 1.00 | 1.07 | 0.87 | 1.00 |

**Influence Areas for Cross Section:**

| Location | Distance | Left | Right | Total | Surface | Direction | Override | Area (sq. ft.) |
|---|---|---|---|---|---|---|---|---|
| 118/11/0 - Side 1 | 0/0/0 | 23/6/0 | 0/0/0 | 23/6/0 | Wall 4 (Operations Building) | Leeward | | 485.88 |
| | 24/7/0 | 23/6/0 | 0/0/0 | 23/6/0 | | | | |

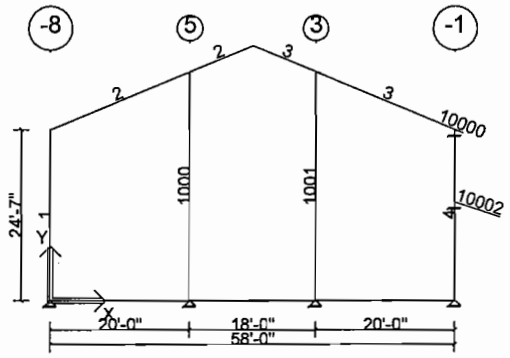
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 118/11/0 - Side 1 | 0/0/0<br>13/8/0 | 0/0/0<br>0/0/0 | 28/10/0<br>28/10/0 | 28/10/0<br>28/10/0 | Wall 3 (Operations Building Lean-to) | Leeward | | 485.88 |

**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz | -7.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz | -14.10 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz | -8.00 | 12/6/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 1000 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | FD | Mezz | -11.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1000 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1000 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |
| 1001 | k | FL | Mezz | -23.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | FD | Mezz | -12.90 | 12/6/0 | NA | NA | N | DOWN | 1.000 | IF |
| 1001 | k | E> | Mezz | -2.30 | 12/6/0 | NA | NA | N | LEFT | 1.000 | IF |
| 1001 | k | <E | Mezz | 2.30 | 12/6/0 | NA | NA | N | RIGHT | 1.000 | IF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | plf | W1> | | -146.57 | 13/8/0 | -0.00 | 22/10/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W1 | | 177.35 | 13/8/0 | 0.00 | 22/10/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | W2> | | -252.10 | 13/8/0 | -0.00 | 22/10/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W2 | | 71.82 | 13/8/0 | 0.00 | 22/10/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | WP | | 227.18 | 13/8/0 | 0.00 | 22/10/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | W1> | | -146.57 | 0/0/2 | -146.57 | 13/8/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W1 | | 177.35 | 0/0/2 | 177.35 | 13/8/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | W2> | | -252.10 | 0/0/2 | -252.10 | 13/8/0 | N | LEFT | 1.000 | OF |
| 4 | plf | <W2 | | 71.82 | 0/0/2 | 71.82 | 13/8/0 | N | RIGHT | 1.000 | OF |
| 4 | plf | WP | | 227.18 | 0/0/2 | 227.18 | 13/8/0 | N | RIGHT | 1.000 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SS | S + SS |
| 5 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 9 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 10 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 11 | System | 1.000 | 0 | 240 | 0.700 WP | WP |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 16 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 17 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 18 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/199 ) | 1.393 | 8 | 2 | 13 | <W1 |
| Max. Vertical Deflection for Span 1 | ( L/1948 ) | 0.110 | 2 | 2 | 7 | W1> |
| Max. Vertical Deflection for Span 2 | ( L/4239 ) | -0.051 | 4 | 2 | 11 | WP |
| Max. Vertical Deflection for Span 3 | ( L/1943 ) | 0.110 | 6 | 2 | 8 | <W1 |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

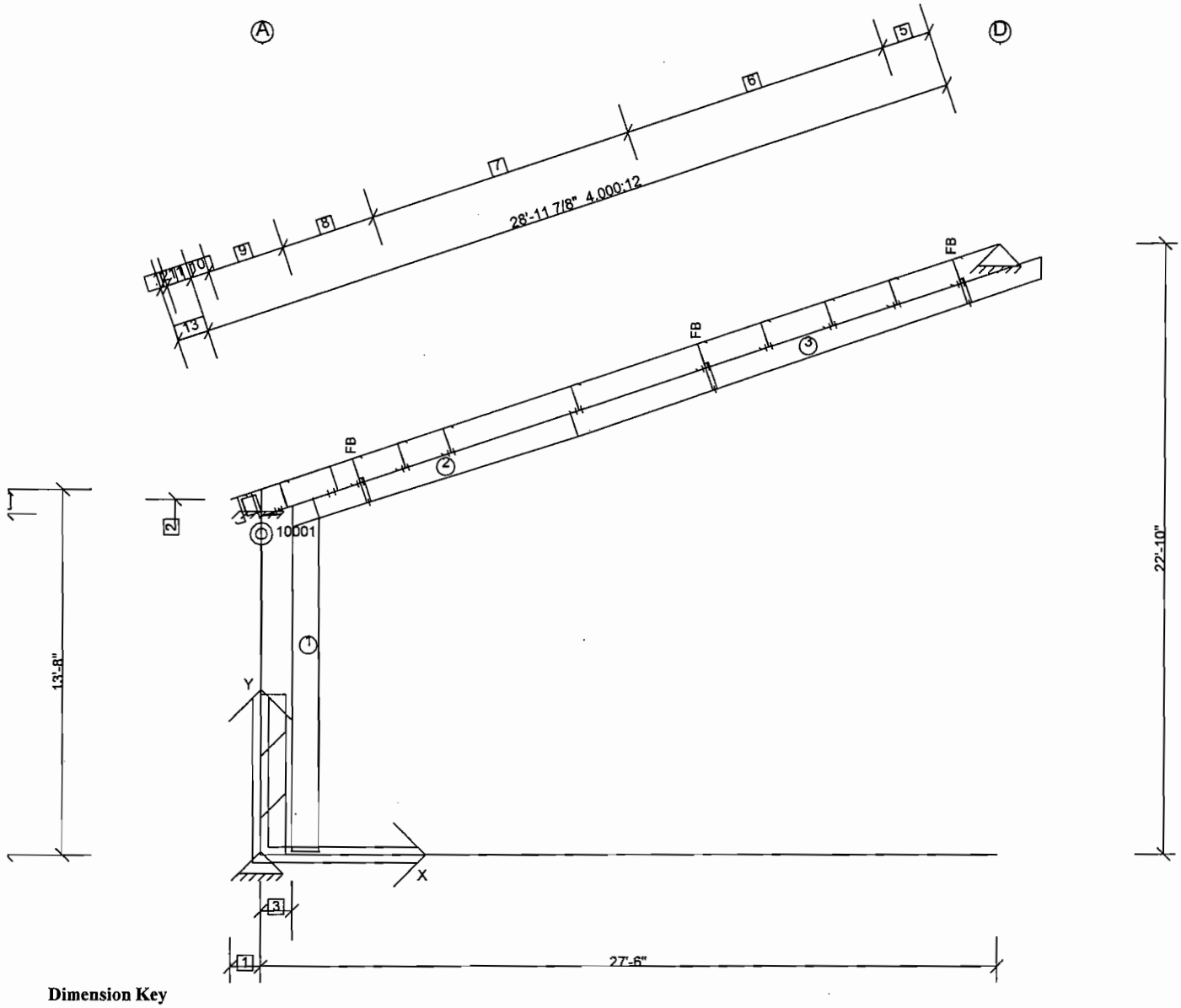
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Wall: 2, Frame at: 1/8/0**

Frame Cross Section:




**Dimension Key**

1 1'-1 1/2"
2 13'-3 1/2"
3 1'-2"
4 11"
5 1'-9 13/16"
6 4 @ 2'-6"
7 2 @ 5'-0"
8 2 @ 1'-9 7/16"
9 2'-10 9/16"
10 8 9/16"
11 11 1/4"
12 3"
13 1'-2 1/4" 4.000:12

**Frame Clearances**
Vert. Clearance at member 1(CX112): 12'-7 1/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 1/8/0 | 10/10/0 | Leanto | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 31 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 33 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 12.92 | 172.5 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.2500 | 0.1345 | 9.00 | 11.00 | 10.92 | 136.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.2500 | 0.1345 | 11.00 | 9.29 | 18.81 | 242.0 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 585.0 (p) (Includes all plates)
Frame Pricing Weight = 632.9 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 1 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 3 | 27/6/0 | 22/10/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 0/0/0 | 13/8/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | Exterior Column | Rafter | | | |
|---|---|---|---|---|---|
| X-Loc | 0/0/0 | 27/6/0 | | | |
| Grid1 - Grid2 | -A | -D | | | |

| Base Plate W x L (in.) | | 8 x 13 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Base Plate Thickness (in.) | | 0.375 | | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | - | 1.3 | - | 0.9 | - | - | - |
| CG | Frm | - | 0.9 | - | 0.7 | - | - | - |
| L> | Frm | - | 3.7 | - | 2.7 | - | - | - |
| <L | Frm | - | 3.7 | - | 2.7 | - | - | - |
| S> | Frm | - | 0.5 | - | 0.3 | - | - | - |
| <S | Frm | - | 0.5 | - | 0.3 | - | - | - |
| S | Frm | - | 0.5 | - | 0.3 | - | - | - |
| SD | Frm | - | 0.3 | - | 1.4 | - | - | - |
| W1> | Frm | 0.9 | -3.0 | 2.5 | -1.3 | - | - | - |
| <W1 | Frm | -0.8 | -3.5 | 1.1 | -2.4 | - | - | - |
| W2> | Frm | 0.4 | -1.3 | 1.0 | -0.5 | - | - | - |
| <W2 | Frm | -1.3 | -1.9 | -0.3 | -1.6 | - | - | - |
| WP | Frm | 1.2 | -4.1 | 3.4 | -1.9 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | 3.7 | - | 2.7 | - | - | - |
| E> | Frm | 0.1 | -0.0 | 0.2 | 0.1 | - | - | - |
| EG+ | Frm | - | 0.1 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | 0.0 | -0.2 | -0.1 | - | - | - |
| EG- | Frm | - | -0.1 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -A | 1.3 | 11 | 1.2 | 12 | - | - | - | - | 3.3 | 17 | 5.9 | 1 | - | - | - | - |
| 27/6/0 | -D | 0.3 | 11 | 3.4 | 12 | - | - | - | - | 1.8 | 14 | 4.3 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 2.3 | 2.2 |
| CG | 0.0 | 0.0 | 1.6 | 1.6 |
| L> | 0.0 | 0.0 | 6.4 | 6.4 |
| <L | 0.0 | 0.0 | 6.4 | 6.4 |
| S> | 0.0 | 0.0 | 0.8 | 0.8 |
| <S | 0.0 | 0.0 | 0.8 | 0.8 |
| S | 0.0 | 0.0 | 0.8 | 0.8 |
| SD | 0.0 | 0.0 | 1.7 | 1.7 |
| W1> | 3.4 | 3.4 | 4.3 | 4.3 |
| <W1 | 0.3 | 0.3 | 5.9 | 5.9 |
| W2> | 1.4 | 1.4 | 1.9 | 1.9 |
| <W2 | 1.7 | 1.7 | 3.5 | 3.5 |
| WP | 4.6 | 4.6 | 6.0 | 6.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 6.4 | 6.4 |
| E> | 0.3 | 0.3 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.3 | 0.3 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -A | 1 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. | Stiff. | Desc. | Loc. | Web Depth | h/t | a/h | a | Thick. | Width | Side | Welding |
|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | No. | | (ft) | (in.) | | | (in.) | (in.) | (in.) | | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 12.10 | 11.461 | 85.21 | N/A | N/A | 0.2500 | 2.000 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 9.50 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush (0) | 2.50 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.00 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 3 | 2 | SIP | 0.375 | 5.00 | 9.79 | 0.500 | A325/ | 3.00 | 12 | Flush (0) | 2.50/2.50 | | Flush (0) | 2.50/2.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 17 | | 2.3 | 6.3 | | 0.0 | 119.9 | 11 | | 0.0 | 7.8 | | 0.0 | 119.9 |
| 2 | 1 | 17 | | 2.3 | 6.3 | | 0.0 | 119.9 | 11 | | 0.0 | 7.8 | | 0.0 | 119.9 |
| 3 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/10/9 | 25/4/11 | FB2050 | |
| 3 | 5/4/0 | 11/9/13 | FB2054 | |
| 3 | 15/4/0 | 1/9/13 | FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.1 | -0.4 | -10.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.05 | 0.02 |
| 1 | 6.23 | 12.00 | 16 | 16 | 1.1 | 1.3 | 50.5 | 0.0 | 113.5 | 17.0 | 197.4 | 55.4 | 0.26 | 0.08 |
| 2 | 10.52 | 11.00 | 17 | 1 | 2.5 | 4.4 | -179.0 | 0.0 | 129.1 | 19.1 | 252.9 | 96.5 | 0.72 | 0.20 |
| 3 | 5.33 | 10.47 | 1 | 1 | 0.2 | -4.1 | 338.3 | 0.0 | 112.5 | 20.2 | 382.2 | 96.7 | 0.89 | 0.19 |

| Mem. | Loc. | Lx | Ly/Lt | Lb | Ag | Afn | Ixx | Iyy | Sx | Sy | Zx | Zy | J | Cw | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ft | in. | in. | in. | in.2 | in.2 | in.4 | in.4 | in.3 | in.3 | in.3 | in.3 | in.4 | in.6 | | | | | |
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 6.23 | 149.56 | 149.6 | 149.6 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.00 | 1.00 | 1.13 | 0.84 | 1.00 |
| 2 | 10.52 | 327.28 | 162.9 | 162.9 | 3.91 | 3.91 | 85.21 | 5.21 | 15.49 | 2.08 | 17.14 | 3.17 | 0.06 | 150.53 | 1.13 | 1.00 | 1.11 | 0.99 | 1.00 |
| 3 | 5.33 | 327.28 | 162.9 | 60.0 | 3.84 | 3.84 | 76.06 | 5.21 | 14.56 | 2.08 | 16.08 | 3.17 | 0.06 | 135.49 | 1.13 | 1.00 | 1.10 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 5 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 6 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 7 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 8 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 9 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 10 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 11 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 12 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 13 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 14 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 15 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

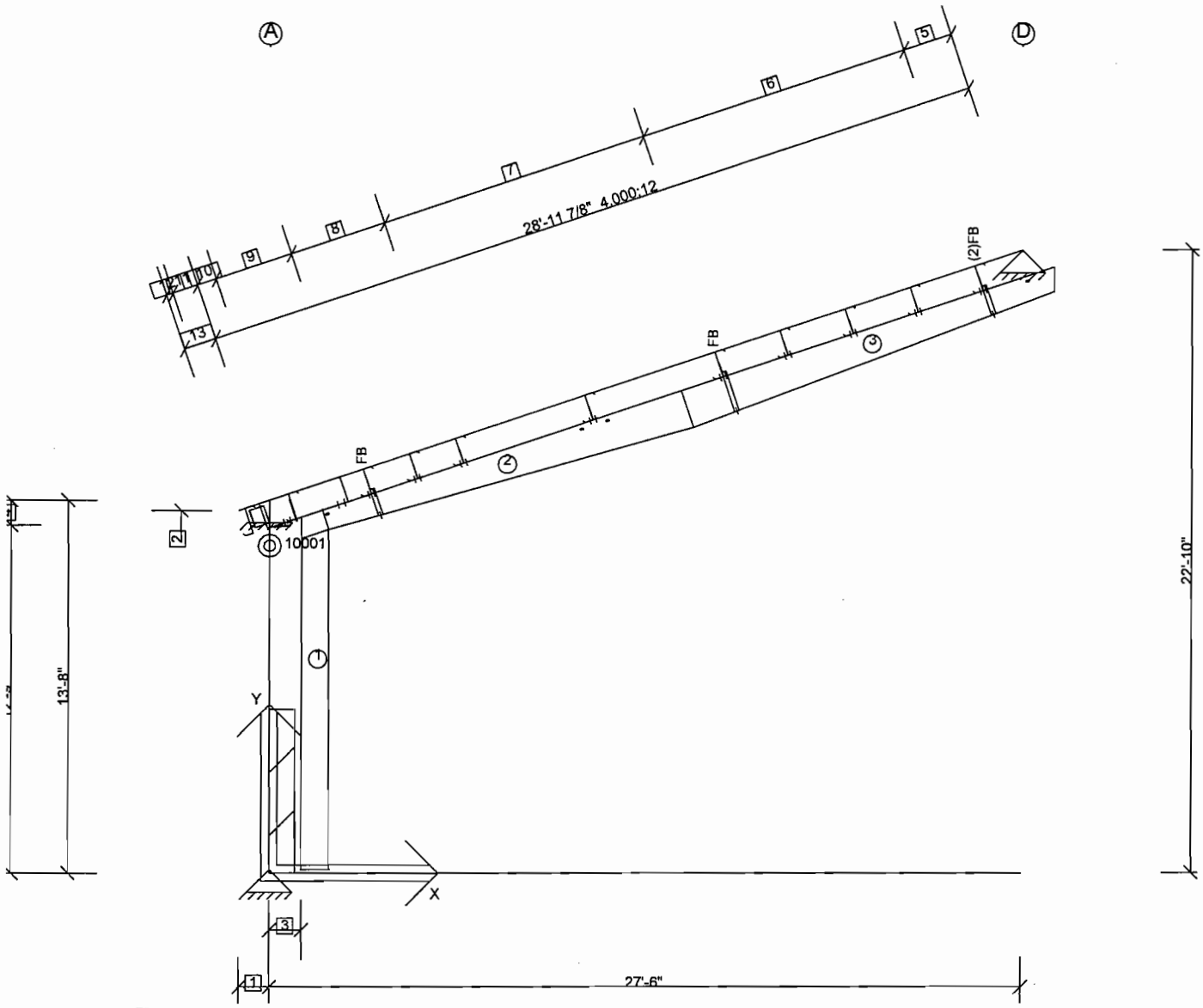
**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/8551 ) | -0.018 | 1 | 2 | 13 | WP |
| Max. Vertical Deflection for Span 1 | ( L/308 ) | -1.020 | 3 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2, Frame at: 20/0/0**
Frame Cross Section: 5




**Dimension Key**
1 1'-1 1/2"
2 13'-3 1/2"
3 1'-2"
4 11"
5 1'-9 13/16"
6 4 @ 2'-6"
7 2 @ 5'-0"
8 2 @ 1'-9 7/16"
9 2'-10 9/16"
10 8 9/16"
11 11 1/4"
12 3"
13 1'-2 1/4" 4.000:12

**Frame Clearances**
Vert. Clearance at member 1(CX113): 12'-7 1/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 20/0/0 | 18/2/0 | Leanto | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 31 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 39 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 43 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 50 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 12.92 | 172.5 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.2500 | 0.1345 | 9.00 | 17.00 | 14.65 | 203.1 | 55.00 | 55.00 | KN | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 5.00 | 0.2500 | 0.1345 | 17.00 | 10.21 | 14.65 | 211.0 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 621.0 (p) (Includes all plates)
Frame Pricing Weight = 678.2 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 1 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 3 | 27/6/0 | 22/10/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 0/0/0 | 13/8/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 5**

| Type | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | |
| Grid1 - Grid2 | | 5-A | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | |
| Load Type | Desc. | Hx | Vy | | | | |
| D | Frm | - | 1.9 | - | - | - | - |
| CG | Frm | - | 1.5 | - | - | - | - |
| L> | Frm | - | 6.0 | - | - | - | - |
| <L | Frm | - | 6.0 | - | - | - | - |
| S> | Frm | - | 0.8 | - | - | - | - |
| <S | Frm | - | 0.8 | - | - | - | - |
| S | Frm | - | 0.8 | - | - | - | - |
| SD | Frm | - | 0.6 | - | - | - | - |
| W1> | Frm | 1.6 | -4.9 | - | - | - | - |
| <W1 | Frm | -1.3 | -5.5 | - | - | - | - |
| W2> | Frm | 0.6 | -2.1 | - | - | - | - |
| <W2 | Frm | -2.2 | -2.7 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| L | Frm | - | 6.0 | - | - | - | - |
| E> | Frm | 0.2 | -0.0 | - | - | - | - |
| EG+ | Frm | - | 0.1 | - | - | - | - |
| <E | Frm | -0.2 | 0.0 | - | - | - | - |
| EG- | Frm | - | -0.1 | - | - | - | - |
| WP | Frm | 2.0 | -5.2 | - | - | - | - |
| WB1> | Brc | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5-A | 2.2 | 11 | 2.0 | 30 | - | - | - | - | 4.3 | 13 | 9.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 3.3 | 3.3 |
| CG | 0.0 | 0.0 | 2.6 | 2.6 |
| L> | 0.0 | 0.0 | 10.4 | 10.4 |
| <L | 0.0 | 0.0 | 10.4 | 10.4 |

| | | | | |
|---|---|---|---|---|
| S> | 0.0 | 0.0 | 1.3 | 1.3 |
| <S | 0.0 | 0.0 | 1.3 | 1.3 |
| S | 0.0 | 0.0 | 1.3 | 1.3 |
| SD | 0.0 | 0.0 | 3.3 | 3.3 |
| W1> | 5.6 | 5.6 | 6.9 | 7.0 |
| <W1 | 0.3 | 0.3 | 9.3 | 9.3 |
| W2> | 2.3 | 2.3 | 2.9 | 2.9 |
| <W2 | 3.0 | 3.0 | 5.3 | 5.3 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 10.4 | 10.4 |
| E> | 0.5 | 0.5 | 0.0 | 0.1 |
| EG+ | 0.1 | 0.0 | 0.2 | 0.2 |
| <E | 0.5 | 0.5 | 0.0 | 0.1 |
| EG- | 0.1 | 0.0 | 0.2 | 0.2 |
| WP | 6.7 | 6.7 | 7.3 | 7.3 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.0 |
| EB> | 0.0 | 0.0 | 0.0 | 0.0 |
| <EB | 0.0 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5-A | 1 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 12.10 | 11.461 | 85.21 | N/A | N/A | 0.2500 | 2.000 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 9.50 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush (0) | 2.50 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.00 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 3 | 2 | SIP | 0.375 | 5.00 | 10.78 | 0.500 | A325/ | 3.00 | 12 | Flush (0) | 2.50 | | Flush (0) | 2.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 43 | | 2.8 | 9.8 | | 0.0 | 119.9 | 19 | | 4.3 | 14.0 | | 0.0 | 119.9 |
| 2 | 1 | 43 | | 2.8 | 9.8 | | 0.0 | 119.9 | 19 | | 4.3 | 14.0 | | 0.0 | 119.9 |
| 3 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/10/9 | 25/4/11 | FB2054 | |
| 3 | 1/7/4 | 11/9/13 | FB2090 | |
| 3 | 11/7/4 | 1/9/13 | (2)FB2060 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.2 | -0.6 | -14.7 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.07 | 0.04 |
| 1 | 6.23 | 12.00 | 15 | 15 | 1.6 | 2.2 | 84.1 | 0.0 | 113.5 | 17.0 | 198.7 | 55.4 | 0.43 | 0.13 |
| 2 | 10.86 | 15.04 | 1 | 1 | -0.6 | 7.3 | 577.4 | 0.0 | 90.9 | 13.6 | 597.5 | 95.5 | 0.97 | 0.34 |
| 3 | 1.61 | 16.26 | 1 | 1 | 0.2 | -6.4 | 606.6 | 0.0 | 139.6 | 12.6 | 657.1 | 95.2 | 0.92 | 0.32 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 6.23 | 149.56 | 149.6 | 149.6 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.00 | 1.00 | 1.13 | 0.84 | 1.00 |
| 2 | 10.86 | 342.12 | 162.9 | 60.0 | 4.46 | 4.46 | 171.16 | 5.21 | 22.76 | 2.08 | 25.59 | 3.19 | 0.06 | 284.95 | 1.15 | 1.00 | 1.06 | 0.96 | 0.77 |
| 3 | 1.61 | 342.12 | 162.9 | 60.0 | 4.61 | 4.61 | 203.08 | 5.21 | 25.03 | 2.08 | 28.28 | 3.20 | 0.07 | 332.48 | 1.15 | 1.00 | 1.04 | 0.95 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 5 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 6 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 7 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 8 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 9 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 13 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 14 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 15 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 16 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 17 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 18 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 22 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 23 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 24 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

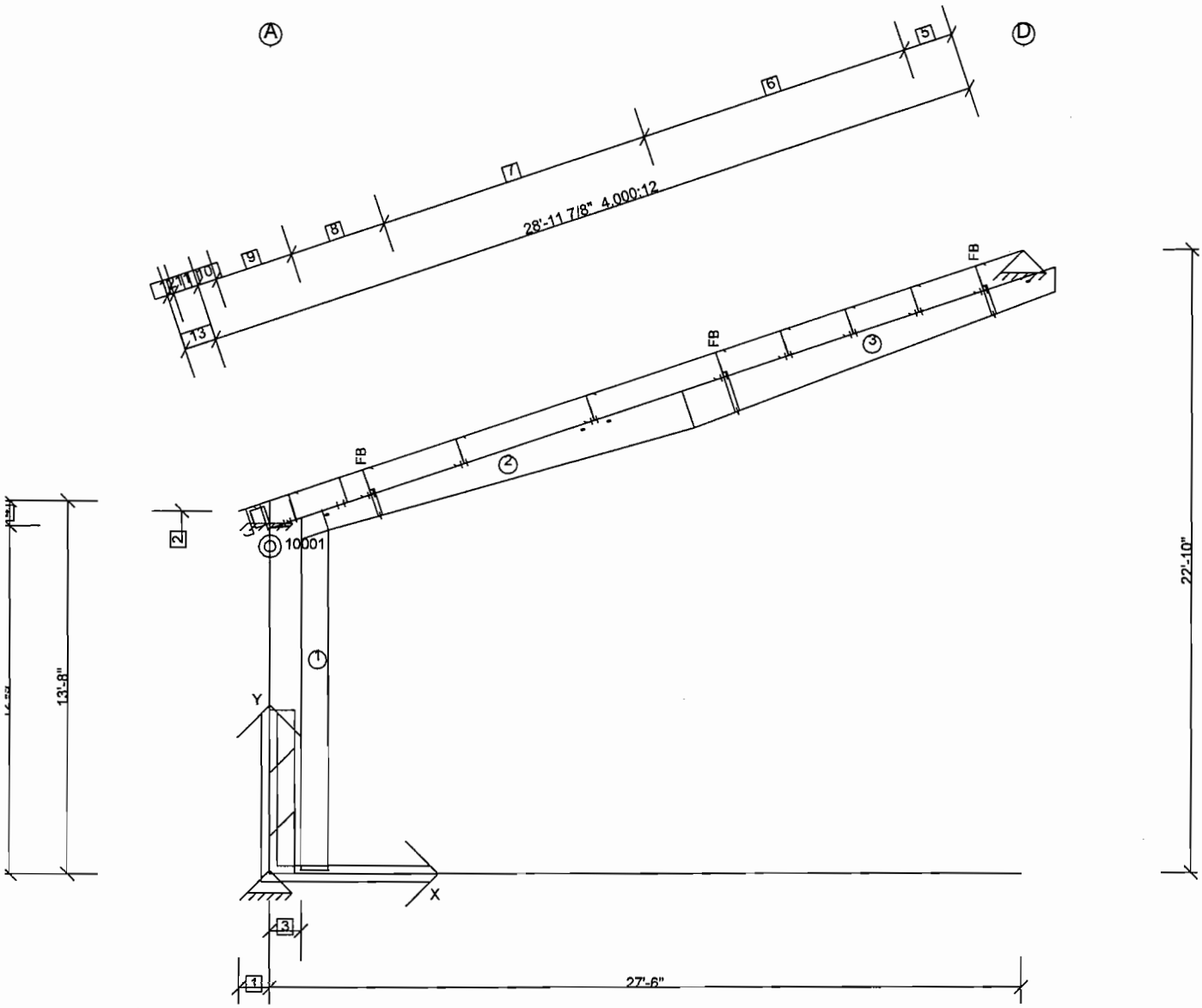
**Controlling Frame Deflection Ratios for Cross Section: 5**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/3936 ) | -0.039 | 1 | 2 | 17 | WP |
| Max. Vertical Deflection for Span 1 | ( L/321 ) | -1.023 | 2 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2, Frame at: 38/0/0**
Frame Cross Section: 3




**Dimension Key**

1 1'-1 1/2"
2 13'-3 1/2"
3 1'-2"
4 11"
5 1'-9 13/16"
6 4 @ 2'-6"
7 2 @ 5'-0"
8 3'-6 7/8"
9 2'-10 9/16"
10 8 9/16"
11 11 1/4"
12 3"
13 1'-2 1/4" 4.000:12

**Frame Clearances**
Vert. Clearance at member 1(CX114): 12'-7 1/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 38/0/0 | 18/2/0 | Leanto | 90.0000 | . | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 31 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 39 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 43 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 50 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 12.92 | 172.5 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.2500 | 0.1345 | 9.00 | 17.00 | 14.65 | 203.1 | 55.00 | 55.00 | KN | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 5.00 | 0.2500 | 0.1345 | 17.00 | 10.21 | 14.65 | 211.0 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 621.0 (p) (Includes all plates)
Frame Pricing Weight = 672.1 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 1 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 3 | 27/6/0 | 22/10/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 0/0/0 | 13/8/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 3**

| Type | Exterior Column |
|---|---|
| X-Loc | 0/0/0 |
| Grid1 - Grid2 | 3-A |
| Base Plate W x L (in.) | 8 x 13 |
| Base Plate Thickness (in.) | 0.375 |
| Anchor Rod Qty/Diam. (in.) | 4 - 0.750 |
| Column Base Elev. | 100'-1 1/2" |

| Load Type | Desc. | Hx | Vy | | | | |
|---|---|---|---|---|---|---|---|
| D | Frm | - | 1.9 | - | - | - | - |
| CG | Frm | - | 1.5 | - | - | - | - |
| L> | Frm | - | 6.0 | - | - | - | - |
| <L | Frm | - | 6.0 | - | - | - | - |
| S> | Frm | - | 0.8 | - | - | - | - |
| <S | Frm | - | 0.8 | - | - | - | - |
| S | Frm | - | 0.8 | - | - | - | - |
| SD | Frm | - | 0.6 | - | - | - | - |
| W1> | Frm | 1.6 | -4.9 | - | - | - | - |
| <W1 | Frm | -1.3 | -5.5 | - | - | - | - |
| W2> | Frm | 0.6 | -2.1 | - | - | - | - |
| <W2 | Frm | -2.2 | -2.7 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| L | Frm | - | 6.0 | - | - | - | - |
| E> | Frm | 0.2 | -0.0 | - | - | - | - |
| EG+ | Frm | - | 0.1 | - | - | - | - |
| <E | Frm | -0.2 | 0.0 | - | - | - | - |
| EG- | Frm | - | -0.1 | - | - | - | - |
| WP | Frm | 2.0 | -5.2 | - | - | - | - |
| WB1> | Brc | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3-A | 2.2 | 11 | 2.0 | 30 | - | - | - | - | 4.3 | 13 | 9.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 3.3 | 3.3 |
| CG | 0.0 | 0.0 | 2.6 | 2.6 |
| L> | 0.0 | 0.0 | 10.4 | 10.4 |
| <L | 0.0 | 0.0 | 10.4 | 10.4 |

| | | | | |
|---|---|---|---|---|
| S> | 0.0 | 0.0 | 1.3 | 1.3 |
| <S | 0.0 | 0.0 | 1.3 | 1.3 |
| S | 0.0 | 0.0 | 1.3 | 1.3 |
| SD | 0.0 | 0.0 | 3.3 | 3.3 |
| W1> | 5.6 | 5.6 | 7.0 | 7.0 |
| <W1 | 0.3 | 0.3 | 9.3 | 9.3 |
| W2> | 2.3 | 2.3 | 2.9 | 2.9 |
| <W2 | 3.0 | 3.0 | 5.3 | 5.3 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 10.4 | 10.4 |
| E> | 0.5 | 0.5 | 0.0 | 0.1 |
| EG+ | 0.1 | 0.0 | 0.2 | 0.2 |
| <E | 0.5 | 0.5 | 0.0 | 0.1 |
| EG- | 0.1 | 0.0 | 0.2 | 0.2 |
| WP | 6.7 | 6.7 | 7.2 | 7.2 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.0 |
| EB> | 0.0 | 0.0 | 0.0 | 0.0 |
| <EB | 0.0 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3-A | 1 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 12.10 | 11.461 | 85.21 | N/A | N/A | 0.2500 | 2.000 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 9.50 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush (0) | 2.50 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.00 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 3 | 2 | SIP | 0.375 | 5.00 | 10.78 | 0.500 | A325/ | 3.00 | 12 | Flush (0) | 2.50 | | Flush (0) | 2.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 43 | | 2.8 | 9.7 | | 0.0 | 119.9 | 19 | | 4.3 | 13.9 | | 0.0 | 119.9 |
| 2 | 1 | 43 | | 2.8 | 9.7 | | 0.0 | 119.9 | 19 | | 4.3 | 13.9 | | 0.0 | 119.9 |
| 3 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/10/9 | 25/4/11 | FB2054 | |
| 3 | 1/7/4 | 11/9/13 | FB2090 | |
| 3 | 11/7/4 | 1/9/13 | FB2060 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.2 | -0.6 | -14.7 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.07 | 0.04 |
| 1 | 6.23 | 12.00 | 15 | 15 | 1.6 | 2.2 | 84.1 | 0.0 | 113.5 | 17.0 | 198.7 | 55.4 | 0.43 | 0.13 |
| 2 | 10.86 | 15.04 | 1 | 1 | -0.6 | 7.3 | 577.4 | 0.0 | 90.9 | 13.6 | 597.5 | 95.5 | 0.97 | 0.34 |
| 3 | 1.61 | 16.26 | 1 | 1 | 0.2 | -6.4 | 606.6 | 0.0 | 139.6 | 12.6 | 657.1 | 95.2 | 0.92 | 0.32 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 6.23 | 149.56 | 149.6 | 149.6 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.00 | 1.00 | 1.13 | 0.84 | 1.00 |
| 2 | 10.86 | 342.12 | 162.9 | 60.0 | 4.46 | 4.46 | 171.16 | 5.21 | 22.76 | 2.08 | 25.59 | 3.19 | 0.06 | 284.95 | 1.15 | 1.00 | 1.06 | 0.96 | 0.77 |
| 3 | 1.61 | 342.12 | 162.9 | 60.0 | 4.61 | 4.61 | 203.08 | 5.21 | 25.03 | 2.08 | 28.28 | 3.20 | 0.07 | 332.48 | 1.15 | 1.00 | 1.04 | 0.95 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 5 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 6 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 7 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 8 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 9 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 13 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 14 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 15 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 16 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 17 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 18 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 22 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 23 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 24 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 3**

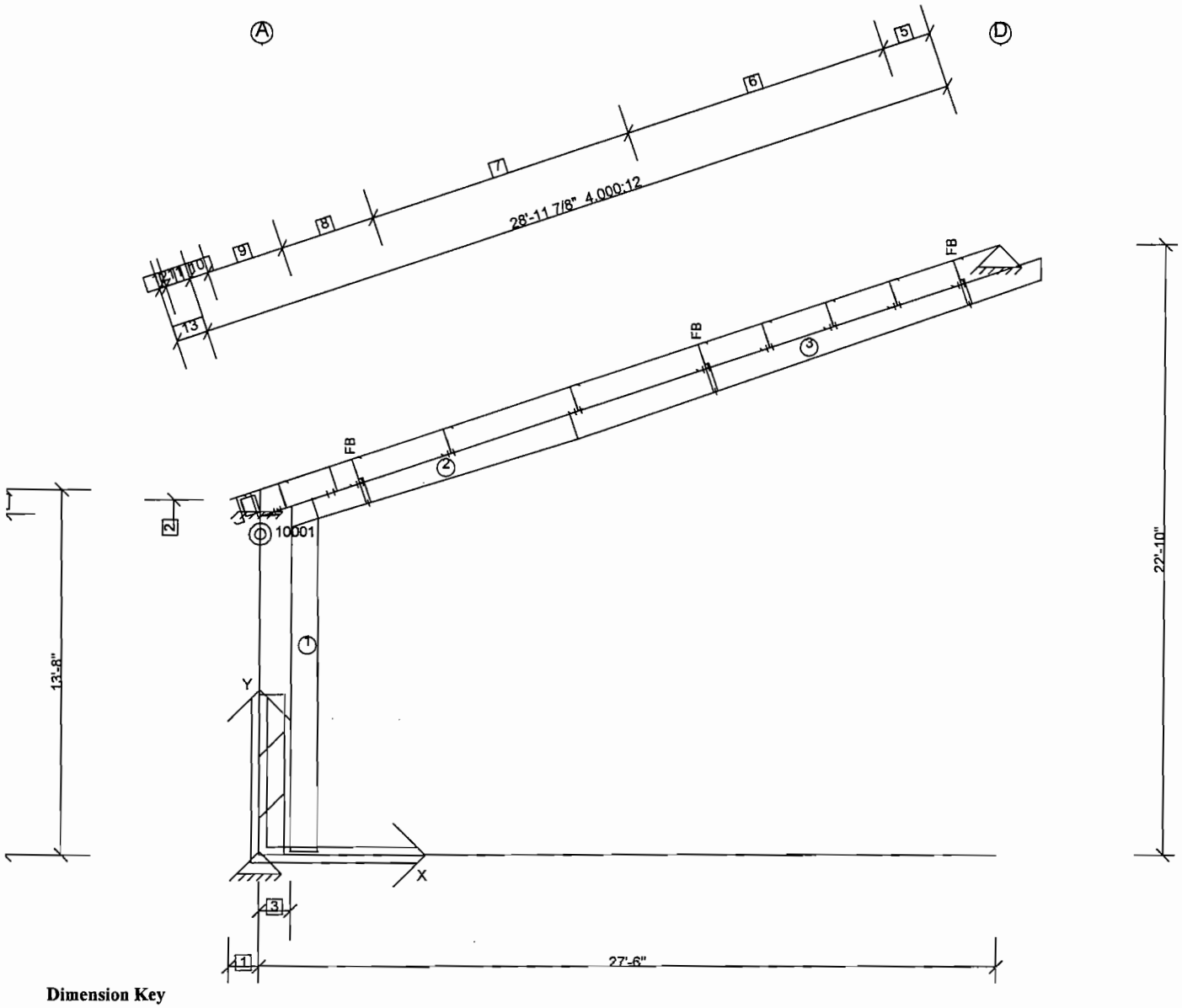
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/3971 ) | -0.038 | 1 | 2 | 17 | WP |
| Max. Vertical Deflection for Span 1 | ( L/321 ) | -1.023 | 3 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2, Frame at: 56/4/0**

Frame Cross Section:




**Dimension Key**

1 1'-1 1/2"
2 13'-3 1/2"
3 1'-2"
4 11"
5 1'-9 13/16"
6 4 @ 2'-6"
7 2 @ 5'-0"
8 3'-6 7/8"
9 2'-10 9/16"
10 8 9/16"
11 11 1/4"
12 3"
13 1'-2 1/4" 4.000:12

**Frame Clearances**
Vert. Clearance at member 1(CX112): 12'-7 1/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 56/4/0 | 10/10/0 | Leanto | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 31 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 33 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 5.00 | 0.1875 | 0.1345 | 12.00 | 12.00 | 12.92 | 172.5 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.2500 | 0.1345 | 9.00 | 12.00 | 10.92 | 138.4 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.2500 | 0.1345 | 12.00 | 9.43 | 18.81 | 246.8 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 592.2 (p) (Includes all plates)
Frame Pricing Weight = 638.6 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 1 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 3 | 27/6/0 | 22/10/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 0/0/0 | 13/8/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | Exterior Column | Rafter | | | |
|---|---|---|---|---|---|
| X-Loc | 0/0/0 | 27/6/0 | | | |
| Grid1 - Grid2 | -A | -D | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Base Plate W x L (in.) | | 8 x 13 | | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | | |
| Column Base Elev. | | 100'-1 1/2" | | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | - | 1.4 | - | 1.0 | - | - | - |
| CG | Frm | - | 1.0 | - | 0.8 | - | - | - |
| L> | Frm | - | 3.9 | - | 3.1 | - | - | - |
| <L | Frm | - | 3.9 | - | 3.1 | - | - | - |
| S> | Frm | - | 0.5 | - | 0.4 | - | - | - |
| <S | Frm | - | 0.5 | - | 0.4 | - | - | - |
| S | Frm | - | 0.5 | - | 0.4 | - | - | - |
| SD | Frm | - | 0.3 | - | 1.4 | - | - | - |
| W1> | Frm | 0.9 | -3.1 | 2.6 | -1.5 | - | - | - |
| <W1 | Frm | -0.8 | -3.9 | 1.4 | -2.8 | - | - | - |
| W2> | Frm | 0.4 | -1.4 | 1.1 | -0.7 | - | - | - |
| <W2 | Frm | -1.3 | -2.3 | -0.1 | -2.0 | - | - | - |
| WP | Frm | 1.2 | -4.2 | 3.5 | -2.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | 3.9 | - | 3.1 | - | - | - |
| E> | Frm | 0.1 | -0.0 | 0.2 | 0.1 | - | - | - |
| EG+ | Frm | - | 0.1 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | 0.0 | -0.2 | -0.1 | - | - | - |
| EG- | Frm | - | -0.1 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -A | 1.3 | 11 | 1.2 | 12 | - | - | - | - | 3.4 | 17 | 6.3 | 1 | - | - | - | - |
| 27/6/0 | -D | 0.1 | 29 | 3.5 | 12 | - | - | - | - | 2.3 | 14 | 4.8 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 2.4 | 2.3 |
| CG | 0.0 | 0.0 | 1.7 | 1.7 |
| L> | 0.0 | 0.0 | 7.0 | 7.0 |
| <L | 0.0 | 0.0 | 7.0 | 7.0 |
| S> | 0.0 | 0.0 | 0.9 | 0.9 |
| <S | 0.0 | 0.0 | 0.9 | 0.9 |
| S | 0.0 | 0.0 | 0.9 | 0.9 |
| SD | 0.0 | 0.0 | 1.7 | 1.7 |
| W1> | 3.5 | 3.5 | 4.5 | 4.5 |
| <W1 | 0.6 | 0.6 | 6.7 | 6.7 |
| W2> | 1.5 | 1.5 | 2.1 | 2.1 |
| <W2 | 1.4 | 1.4 | 4.3 | 4.3 |
| WP | 4.7 | 4.7 | 6.3 | 6.3 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 7.0 | 7.0 |
| E> | 0.3 | 0.3 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.3 | 0.3 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -A | 1 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. | Stiff. | Desc. | Loc. | Web Depth | h/t | a/h | a | Thick. | Width | Side | Welding |
|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | No. | | (ft) | (in.) | | | (in.) | (in.) | (in.) | | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 12.10 | 11.461 | 85.21 | N/A | N/A | 0.2500 | 2.000 | Both | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 9.50 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush (0) | 2.50 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.00 | 0.750 | A325/ | 3.00 | 11 | Flush | 2.50 | 11 | Flush | 2.50 |
| 3 | 2 | SIP | 0.375 | 5.00 | 9.95 | 0.500 | A325/ | 3.00 | 12 | Flush (0) | 2.50/2.50 | | Flush (0) | 2.50/2.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 17 | | 2.4 | 6.9 | | 0.0 | 119.9 | 21 | | 2.5 | 7.5 | | 0.0 | 119.9 |
| 2 | 1 | 17 | | 2.4 | 6.9 | | 0.0 | 119.9 | 21 | | 2.5 | 7.5 | | 0.0 | 119.9 |
| 3 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/10/9 | 25/4/11 | FB2050 | |
| 3 | 5/4/0 | 11/9/13 | FB2060 | |
| 3 | 15/4/0 | 1/9/13 | FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.1 | -0.4 | -10.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.05 | 0.02 |
| 1 | 6.23 | 12.00 | 16 | 16 | 1.4 | 1.3 | 50.5 | 0.0 | 113.5 | 17.0 | 198.4 | 55.4 | 0.26 | 0.08 |
| 2 | 10.52 | 12.00 | 14 | 1 | 0.3 | 4.7 | -194.8 | 0.0 | 133.5 | 17.4 | 265.3 | 96.3 | 0.74 | 0.22 |
| 3 | 5.33 | 11.20 | 1 | 1 | 0.2 | -4.5 | 374.1 | 0.0 | 115.9 | 18.8 | 414.5 | 96.5 | 0.90 | 0.21 |

| Mem. | Loc. | Lx | Ly/Lt | Lb | Ag | Afn | Ixx | Iyy | Sx | Sy | Zx | Zy | J | Cw | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ft | in. | in. | in. | in.2 | in.2 | in.4 | in.4 | in.3 | in.3 | in.3 | in.3 | in.4 | in.6 | | | | | |
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 6.23 | 149.56 | 149.6 | 149.6 | 3.44 | 3.44 | 83.02 | 3.91 | 13.84 | 1.56 | 15.62 | 2.40 | 0.03 | 136.35 | 1.00 | 1.00 | 1.13 | 0.84 | 1.00 |
| 2 | 10.52 | 327.29 | 162.9 | 162.9 | 4.05 | 4.05 | 103.35 | 5.21 | 17.22 | 2.08 | 19.13 | 3.18 | 0.06 | 179.85 | 1.15 | 1.00 | 1.11 | 0.98 | 1.00 |
| 3 | 5.33 | 327.29 | 162.9 | 60.0 | 3.94 | 3.94 | 88.22 | 5.21 | 15.79 | 2.08 | 17.49 | 3.17 | 0.06 | 155.43 | 1.13 | 1.00 | 1.11 | 0.99 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 S + 1.0 SD | S + SD |
| 4 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 5 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 6 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 7 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 8 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 9 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 10 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 11 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 12 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 13 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 14 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 15 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/6917 ) | -0.022 | 1 | 2 | 13 | WP |
| Max. Vertical Deflection for Span 1 | ( L/322 ) | -0.978 | 2 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Covering - Summary Report

### Shape: Operations Building

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.705)
Parts Wind Exposure Factor: 0.705
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/3/12
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 25.92 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3628
Bracing Seismic Period: 0.2208
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Covering Design Loads - Wall: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 0/0/0 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 0/0/0 | 50.000 | 0.61 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 52/2/6 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 52/2/6 | 50.000 | 0.61 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower and Upper Girt | 33.17 | 5/9/10 | 41.000 | 0.81 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower and Upper Girt | 30.58 | 5/9/10 | 50.000 | 0.61 | IN | 1.180 |

**Covering Design Loads - Wall: 2**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 0/0/0 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 0/0/0 | 50.000 | 0.61 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 114/8/6 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 114/8/6 | 50.000 | 0.61 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower and Upper Girt | 33.17 | 0/0/0 | 41.000 | 0.81 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower and Upper Girt | 30.58 | 0/0/0 | 50.000 | 0.61 | IN | 1.180 |

**Covering Design Loads - Wall: 3**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 0/0/0 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 0/0/0 | 50.000 | 0.61 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 52/2/6 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 52/2/6 | 50.000 | 0.61 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower and Upper Girt | 33.17 | 5/9/10 | 41.000 | 0.81 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower and Upper Girt | 30.58 | 5/9/10 | 50.000 | 0.61 | IN | 1.180 |

**Covering Design Loads - Wall: 4**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.95 | 0/0/0 | 41.000 | 1.00 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.58 | 0/0/0 | 50.000 | 0.61 | IN | 1.180 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Interior Area | psf | W1> | Need Lower and Upper Girt | 33.17 | 5/9/10 | 41.000 | 0.81 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower and Upper Girt | 30.58 | 5/9/10 | 50.000 | 0.61 | IN | 1.180 |

**Covering Design Loads - Roof: A**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -1/1/8 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 2.30 | -1/1/8 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 2.30 | -1/1/8 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 14.81 | -1/1/8 | 86.000 | 0.17 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 4/8/2 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 4/8/2 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | -1/1/8 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | -1/1/8 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 0/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 0/0/0 | 86.000 | 0.23 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 55.22 | 0/0/0 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 0/0/0 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 0/0/0 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 0/0/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 115/9/14 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 115/9/14 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 115/9/14 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 115/9/14 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 120/6/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 120/6/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 120/6/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 120/6/0 | 86.000 | 0.23 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 55.22 | 120/6/0 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 120/6/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 120/6/0 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 120/6/0 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 120/6/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 120/6/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 114/8/6 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 114/8/6 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 114/8/6 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 114/8/6 | 86.000 | 0.23 | IN | 0.680 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 77/5/10 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 77/5/10 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 81/1/10 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 81/1/10 | 86.000 | 0.23 | IN | 0.680 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 73/2/14 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 73/2/14 | 86.000 | 0.23 | IN | 0.680 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 26.19 | 4/8/2 | 57.000 | 0.46 | OUT | -1.080 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 19.42 | 4/8/2 | 86.000 | 0.23 | IN | 0.680 |

**Covering Design Loads - Roof: B**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -1/1/8 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 4.10 | -1/1/8 | 86.000 | 0.05 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 4.10 | -1/1/8 | 86.000 | 0.05 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 16.48 | -1/1/8 | 86.000 | 0.19 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 4/8/2 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 4/8/2 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | -1/1/8 | 99.000 | 0.95 | OUT | -3.700 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | -1/1/8 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 0/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 0/0/0 | 86.000 | 0.23 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 55.22 | 0/0/0 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 0/0/0 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 0/0/0 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 0/0/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 115/9/14 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 115/9/14 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 115/9/14 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 115/9/14 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 120/6/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 120/6/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 120/6/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 120/6/0 | 86.000 | 0.23 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 55.22 | 120/6/0 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 120/6/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 75.43 | 120/6/0 | 75.000 | 1.01 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 120/6/0 | 86.000 | 0.23 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 120/6/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.76 | 120/6/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.92 | 115/9/14 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.42 | 115/9/14 | 86.000 | 0.23 | IN | 0.680 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 26.19 | 4/8/2 | 57.000 | 0.46 | OUT | -1.080 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 19.42 | 4/8/2 | 86.000 | 0.23 | IN | 0.680 |

**Covering Design Loads - Wall: 2 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Corner Zone | psf | W1> | No Resolution Available | 94.09 | 0/0/0 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | No Resolution Available | 94.09 | 116/11/6 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 116/11/6 | 74.000 | 0.20 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 55.22 | 5/9/10 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 5/9/10 | 74.000 | 0.20 | IN | 0.500 |

**Covering Design Loads - Wall: 2 - Canopy: 2**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.34 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 5.34 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 31.67 | 1/1/8 | 74.000 | 0.43 | IN | 1.000 |
| Sliding Snow Load | psf | SS | Standard Spacing is Adequate | 2.72 | 1/1/8 | 74.000 | 0.04 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 31.97 | 0/0/0 | 74.000 | 0.43 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 0/0/0 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 55.22 | 5/9/10 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 5/9/10 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 2/6/0 Required | 94.09 | 70/7/14 | 99.000 | 0.95 | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 70/7/14 | 74.000 | 0.20 | IN | 0.500 |

**Covering Design Loads - Wall: 4 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 55.22 | 0/0/0 | 57.000 | 0.97 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | No Resolution Available | 94.09 | 74/4/6 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.76 | 74/4/6 | 74.000 | 0.20 | IN | 0.500 |

WALLS ARE EP12, 22GA. HATS ON BLOCK (NBVP) MUST BE SPACED PER NEXT PAGE →

**Panel Data**

| Wall/Roof | Type | Thickness | Finish | Color | Direction | Gable Dir | Max. Length |
|---|---|---|---|---|---|---|---|
| Wall: 1 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Location: 3 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 4 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Wall: 2 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Location: 3 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 4 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 5 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 6 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 7 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 8 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Canopy: 1 | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Canopy: 2 | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Wall: 3 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Wall: 4 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Location: 3 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 4 | NBVP - Panel | 1/16" | psf = 50.00 | Supported by others=no | | | |
| Location: 5 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 6 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 7 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 8 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 9 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Location: 10 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Canopy: 3 | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Roof: A | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Roof: B | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Mezzanine 1 @ 12/9/0 | NBVP - Panel | 0'-0" | psf = 0.00 | Supported by others=no | | | |

**Fastener Data**

| Wall/Roof | Type | Length | Spacing | Washers | Insul. Block | Mod. Ctrl. | Ice Damming |
|---|---|---|---|---|---|---|---|
| Wall: 1 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Location: 4 | Not Applicable | | | | | | |
| Wall: 2 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Location: 4 | Not Applicable | | | | | | |
| Location: 5 | Not Applicable | | | | | | |
| Location: 6 | Not Applicable | | | | | | |
| Location: 7 | Not Applicable | | | | | | |
| Location: 8 | Not Applicable | | | | | | |
| Canopy: 1 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Canopy: 2 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Wall: 3 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Wall: 4 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Location: 4 | Not Applicable | | | | | | |
| Location: 5 | Not Applicable | | | | | | |
| Location: 6 | Not Applicable | | | | | | |
| Location: 7 | Not Applicable | | | | | | |
| Location: 8 | Not Applicable | | | | | | |
| Location: 9 | Not Applicable | | | | | | |
| Location: 10 | Not Applicable | | | | | | |

## FLUSH PANEL - Allowable Wind Load vs. Span (psf)

ANY (1) SPAN OR (2) SPAN PANELS

| Panel Designation: | Pressure Direction | Simple Span Condition-Maximum Span | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2.0 ft. | 2.5 ft. | 3.0 ft. | 3.5 ft. | 4.0 ft. | 4.5 ft | 5.0 ft. |
| FP12 –24 Ga. Steel [1] | Inward | 99 | 60 | 35 | 22 | 15 | 10 | 8 |
| | Outward | 29 | 29 | 29 | 29 | 29 | 23 | 18 |
| FP12 –22 Ga. Steel [1] | Inward | 155 | 88 | 51 | 32 | 21 | 15 | 11 |
| | Outward | 45 | 45 | 45 | 45 | 45 | 35 | 27 |
| FP12 –.032 Al. [1] | Inward | 67 | 34 | 20 | 12 | 8 | 6 | 4 |
| | Outward | 18 | 18 | 18 | 18 | 18 | 14 | 10 |

*Allowable loads **do not** include a 4/3 stress increase for wind load cases.*

**Table Notes:**
1. ASTM E-72, Ting (9/91)

3 SPAN & MORE PANELS

| Panel Designation: | Pressure Direction | 3 Span Condition - Maximum Span | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2.0 ft. | 2.5 ft. | 3.0 ft. | 3.5 ft. | 4.0 ft. | 4.5 ft | 5.0 ft. |
| FP12 –24 Ga. Steel [1] | Inward | 143 | 92 | 64 | 47 | 36 | 28 | 21 |
| | Outward | 29 | 29 | 29 | 29 | 29 | 28 | 22 |
| FP12 –22 Ga. Steel [1] | Inward | 223 | 143 | 99 | 73 | 56 | 40 | 29 |
| | Outward | 45 | 45 | 45 | 45 | 45 | 38 | 31 |
| FP12 –.032 Al. [1] | Inward | 116 | 74 | 52 | 33 | 22 | 16 | 11 |
| | Outward | 18 | 18 | 18 | 18 | 18 | 18 | 16 |

*Allowable loads **do not** include a 4/3 stress increase for wind load cases.*

**Table Notes:**
1. ASTM E-72, Ting (9/91)

HAT SECTIONS ON BLOCK (NBVA) SUPPORT PANELS. SPACING SHOULD NOT EXCEED 3'-6 / 4' AS NOTED ABOVE.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Canopy: 3 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Roof: A | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Roof: B | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Mezzanine 1 @ 12/9/0 | Not Applicable | | | | | | |

## Shape: Operations Building Lean-to

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.608)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 9/1/8
Parts / Portions Zone Strip Width: 5/9/10
Basic Wind Pressure: 22.35,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2859
Bracing Seismic Period: 0.1766
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Covering Design Loads - Wall: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 0/0/0 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.40 | 0/0/0 | 50.000 | 0.61 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower and Upper Girt | 32.98 | 5/9/10 | 41.000 | 0.80 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower and Upper Girt | 30.40 | 5/9/10 | 50.000 | 0.61 | IN | 1.180 |

**Covering Design Loads - Wall: 2**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 0/0/0 | 49.000 | 0.83 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.40 | 0/0/0 | 60.000 | 0.51 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 52/2/6 | 49.000 | 0.83 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.40 | 52/2/6 | 60.000 | 0.51 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower and Upper Girt | 32.98 | 5/9/10 | 49.000 | 0.67 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower and Upper Girt | 30.40 | 5/9/10 | 60.000 | 0.51 | IN | 1.180 |

**Covering Design Loads - Wall: 3**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 21/8/6 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower and Upper Girt | 30.40 | 21/8/6 | 50.000 | 0.61 | IN | 1.180 |

**Covering Design Loads - Roof: A**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -1/1/8 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 2.50 | -1/1/8 | 86.000 | 0.03 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 28.39 | 58/0/0 | 86.000 | 0.33 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 33.89 | 48/4/0 | 86.000 | 0.39 | IN | 1.000 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Snow Drift | psf | SD | Standard Spacing is Adequate | 39.39 | 38/8/0 | 86.000 | 0.46 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 39.39 | 29/0/0 | 86.000 | 0.46 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 33.89 | 19/4/0 | 86.000 | 0.39 | IN | 1.000 |
| Snow Drift | psf | SD | Standard Spacing is Adequate | 28.39 | 9/8/0 | 86.000 | 0.33 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 77.55 | 22/0/14 | 80.000 | 0.97 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 22/0/14 | 86.000 | 0.19 | IN | 0.580 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 0/0/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 0/0/0 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 0/0/0 | 86.000 | 0.19 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 77.55 | 35/11/2 | 80.000 | 0.97 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 35/11/2 | 86.000 | 0.19 | IN | 0.580 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 77.55 | 34/9/10 | 80.000 | 0.97 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 34/9/10 | 86.000 | 0.19 | IN | 0.580 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 0/0/0 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 0/0/0 | 86.000 | 0.19 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 4/8/2 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 4/8/2 | 86.000 | 0.19 | IN | 0.580 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 52/2/6 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 52/2/6 | 86.000 | 0.19 | IN | 0.580 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 22/0/14 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 22/0/14 | 86.000 | 0.19 | IN | 0.580 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 36.33 | 4/8/2 | 57.000 | 0.64 | OUT | -1.480 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 16.74 | 4/8/2 | 86.000 | 0.19 | IN | 0.580 |

**Covering Design Loads - Wall: 2 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.34 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 0/0/0 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 53/3/14 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 53/3/14 | 74.000 | 0.20 | IN | 0.500 |

**Panel Data**

22 GA FP12 PER PREVIOUS NOTES

| Wall/Roof | Type | Thickness | Finish | Color | Direction | Gable Dir | Max. Length |
|---|---|---|---|---|---|---|---|
| Wall: 1 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Wall: 2 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Canopy: 1 | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Wall: 3 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Location: 3 | Open | | Exposed to wind | | | | |
| Wall: 4 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | psf = 50.00 | Supported by others=no | | | |
| Roof: A | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |

**Fastener Data**

| Wall/Roof | Type | Length | Spacing | Washers | Insul. Block | Mod. Ctrl. | Ice Damming |
|---|---|---|---|---|---|---|---|
| Wall: 1 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Wall: 2 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Canopy: 1 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Wall: 3 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Wall: 4 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Roof: A | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |

# *Underwriters Laboratory UL-90 Letter*



## Underwriters Laboratory UL-90 Letter

Contact:
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002

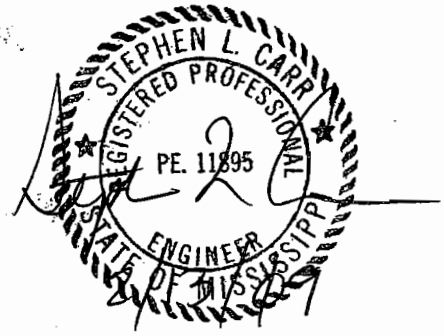
Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

The goods listed herein are purchased subject to the VP BUILDINGS terms and conditions of sale and the limitations contained therein.

**Roof Covering**

| Shape | Location | Type | Thickness | Spacing |
|---|---|---|---|---|
| Operations Building | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Operations Building | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Operations Building | Wall: 4,Canopy: 4 | SLR2 | 22 | UL90 Uplift |
| Operations Building | Roof: A | SLR2 | 22 | UL90 Uplift |
| Operations Building | Roof: B | SLR2 | 22 | UL90 Uplift |
| Operations Building Lean-to | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Operations Building Lean-to | Roof: A | SLR2 | 22 | UL90 Uplift |




2440

Project Name: Stennis Riverine
Contract: N69450-05-D-0096
Baun Proj.: 3013-70
Submittal: 13125-06
Reviewed
Reviewed by: J. Collins
Date: 2/17/09

REVIEWED FOR APPR. MDE 11 FEB 09

# VP Buildings

3200 Players Club Circle
Memphis, TN 38125-8843

# STRUCTURAL DESIGN DATA

Project: Riverine and Combatant Craft Operations Facility
Name: 08-28914 EP2
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County: Hancock
Country: United States

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Project Name: Stennis Riverine
Contract: N62450-05-D-2096
BemProject: 3013-70
Submittal: 13125-13 Revised
Reviewed by: J. Collins
Date: 2/17/09

"For Approval"

STATE OF LOUISIANA
STEPHEN L. CARR
REG. No. 24811
REGISTERED PROFESSIONAL ENGINEER
CIVIL ENGINEERING
2/12/09

STEPHEN L. CARR
REGISTERED PROFESSIONAL ENGINEER
PE. 11895
STATE OF MISSISSIPPI
2/12/09

## Letter of Certification

Contact:
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

This is to certify that the above referenced VP BUILDINGS project has been designed for the applicable portions of the following Building Code and in accordance with the order documents which have stipulated the following applied environmental loads and conditions:

**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Maintenance Area | 67/0/0 | 102/8/0 | 6879 | 8270 | 8076 | 22/2/0 | 22/2/0 | 4.000:12 | 4.000:12 | 33/4/0 |
| ****Clerestory Shape**** | 67/0/0 | 102/8/0 | 6879 | 8909 | 7933 | 36/6/6 | 22/2/0 | 4.000:12 | 4.000:12 | 36/6/6 |
| Clerestory Frames | 9/7/1 | 102/8/0 | 984 | 1076 | 1059 | 6/4/11 | 3/2/5 | 4.000:12 | | |
| Total For All Shapes | | | 14742 | 18255 | 17068 | ** 'Clerestory Shape' is for supplemental use only ** | | | | |

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Crane Schedule Information**

| Name | Type | Service Classification | Method of Operation | Capacity (Ton) | Bridge Span | Bridge Construction |
|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | Monorail Crane | C (Moderate Service) | Pendant Operated | 2.00 | N/A | N/A |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes – Shape: Clerestory Shape**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC – ASD
Cold Form: 04AISI – ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.696)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 14/8/1
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.60,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response – Ss:11.80 %g
Mapped Spectral Response – S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4180
Bracing Seismic Period: 0.2522
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes – Shape: Clerestory Frames**
**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC – ASD
Cold Form: 04AISI – ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.575)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 4/9/8
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 21.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response – Ss:11.80 %g
Mapped Spectral Response – S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.0981
Bracing Seismic Period: 0.0648
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

The steel design is in accordance with VP BUILDINGS standard design practices, which have been established based upon pertinent procedures and recommendations of the following organizations:

American Institute of Steel Construction (AISC)
American Iron and Steel Institute (AISI)
American Welding Society (AWS)
American Society for Testing and Materials (ASTM)
Canadian Standards Association
CSA W59-Welded Steel Construction
Limit State Design of Steel Structures
Metal Building Manufacturers Association (MBMA)

VP Buildings is certified by:
- CSA A660 Certified (Design and Manufacturing)
- IAS Approved Fabricator
- Canadian Welding Bureau Div. 1 Certified

VP Buildings has designed the structural steel components of this building in accordance with the Building Code, Steel Specifications, and Standards indicated above. Steel components are designed utilizing the following steel grades unless noted otherwise:

3 Plate members fabricated from plate, bar, strip steel or sheets
ASTM A529, A572, A1011 – All Grade 55 ksi
Hot Rolled Shapes (W, S, C, Angles, etc)
ASTM A36, or ASTM A36Mod50, A529, A572, A588, A709, A992-All Grade 50 ksi
Tube and Pipe Sections ASTM A500, Grade B (Fy – 42 ksi pipe, Fy – 46 ksi tube)
Light Gage Sections ASTM A1011 SS Grade 55 ksi, A653 SS Grade 60 ksi
Round Rod Bracing ASTM A572 Grade 50 ksi

This certification DOES NOT apply to the design of the foundation or other on-site structures or components not supplied by VP BUILDINGS, nor does it apply to unauthorized modifications to framing systems provided by VP BUILDINGS.

Furthermore, it is understood that certification is based upon the premise that all components furnished by VP BUILDINGS will be erected or constructed in strict compliance with pertinent documents furnished by VP BUILDINGS.

Sincerely,

STATE OF LOUISIANA
STEPHEN L. CARR
REG. No. 24811
REGISTERED
PROFESSIONAL ENGINEER

STEPHEN L. CARR P.E. Prepared by: MDE Reviewed by: SLC

VP BUILDINGS
3200 Players Club Circle, Memphis TN 38125-8843

CIVIL ENGINEERING
STEPHEN L. CARR
REGISTERED PROFESSIONAL
PE. 11895
ENGINEER
STATE OF MISSISSIPPI

## Building Loading – Summary Report

### Shape: Maintenance Area

**Loads and Codes – Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC – ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI – ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response – Ss:11.80 %g
Mapped Spectral Response – S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

**Crane Schedule Information**

| Name | Type | Service Classification | Method of Operation | Capacity (Ton) | Bridge Span | Bridge Construction |
|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | Monorail Crane | C (Moderate Service) | Pendant Operated | 2.00 | N/A | N/A |

| Name | Bridge Wt (k) | Trolley / Hoist Wt (k) | Wheel Spacing | Wheel Load (k) | No. of Wheels | Horz. Clear | Vert. Clear | Headroom | Crane Spacing | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | 0.00 | 0.50 | 0/6/0 | 2.54 | 2 | 1/0/0 | 0/0/0 | 2/7/2 | 0/10/14 | |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations – Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |

| | | | | |
|---|---|---|---|---|
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Design Load Combinations – Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations – Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 6) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 6) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |

| | | | | |
|---|---|---|---|---|
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 23 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 24 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 25 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 27 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |

**Design Load Combinations – Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |
| 4 | System | 1.000 | 0.700 E> | E> |
| 5 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations – Roof – Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 L | D + L |
| 2 | System | 1.000 | 1.0 D + 1.0 S | D + S |
| 3 | System | 1.000 | 1.0 D + 1.0 US1* | D + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 *US1 | D + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 W1> | D + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 <W2 | D + <W2 |
| 7 | System | 1.000 | 0.600 D + 1.0 W1> | D + W1> |
| 8 | System | 1.000 | 0.600 D + 1.0 <W2 | D + <W2 |

**Design Load Combinations – Wall – Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |

**Deflection Load Combinations – Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Deflection Load Combinations – Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations – Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 0.500 <E | <E |

**Deflection Load Combinations – Roof – Panel**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 1.0 S | S |
| 2 | System | 1.000 | 150 | 150 | 1.0 US1* | US1* |
| 3 | System | 1.000 | 150 | 150 | 1.0 *US1 | *US1 |

**User Applied Surface Loads (Local Coordinate System)**

| Side | Shape | Units | Type | Description | Mag | X-Loc | Y-Loc | Frm | Brc | Grt | Pur | Pnl | Supp. | Dir. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | LN | plf | W1> | Clerestory | 126.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | W1> | Clerestory | 126.00 | 102/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | W2> | Clerestory | 218.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | W2> | Clerestory | 218.00 | 102/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | <W1 | Clerestory | 153.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| 4 | LN | plf | <W1 | Clerestory | 153.00 | 102/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| 4 | LN | plf | <W2 | Clerestory | 61.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| 4 | LN | plf | <W2 | Clerestory | 61.00 | 102/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 0/0/0 | -9/6/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 102/8/0 | -9/6/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 3.47 | 103/9/8 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 3.47 | 103/9/8 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 3.47 | 0/0/0 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 3.47 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 103/9/8 | 0/0/0 | N | N | N | Y | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 103/9/8 | -9/11/5 | N | N | N | Y | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 0/0/0 | -9/11/5 | N | N | N | Y | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 0/0/0 | 0/0/0 | N | N | N | Y | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 103/9/8 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 103/9/8 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 0/0/0 | -9/11/5 | Y | N | N | N | N | N | IN | OF |

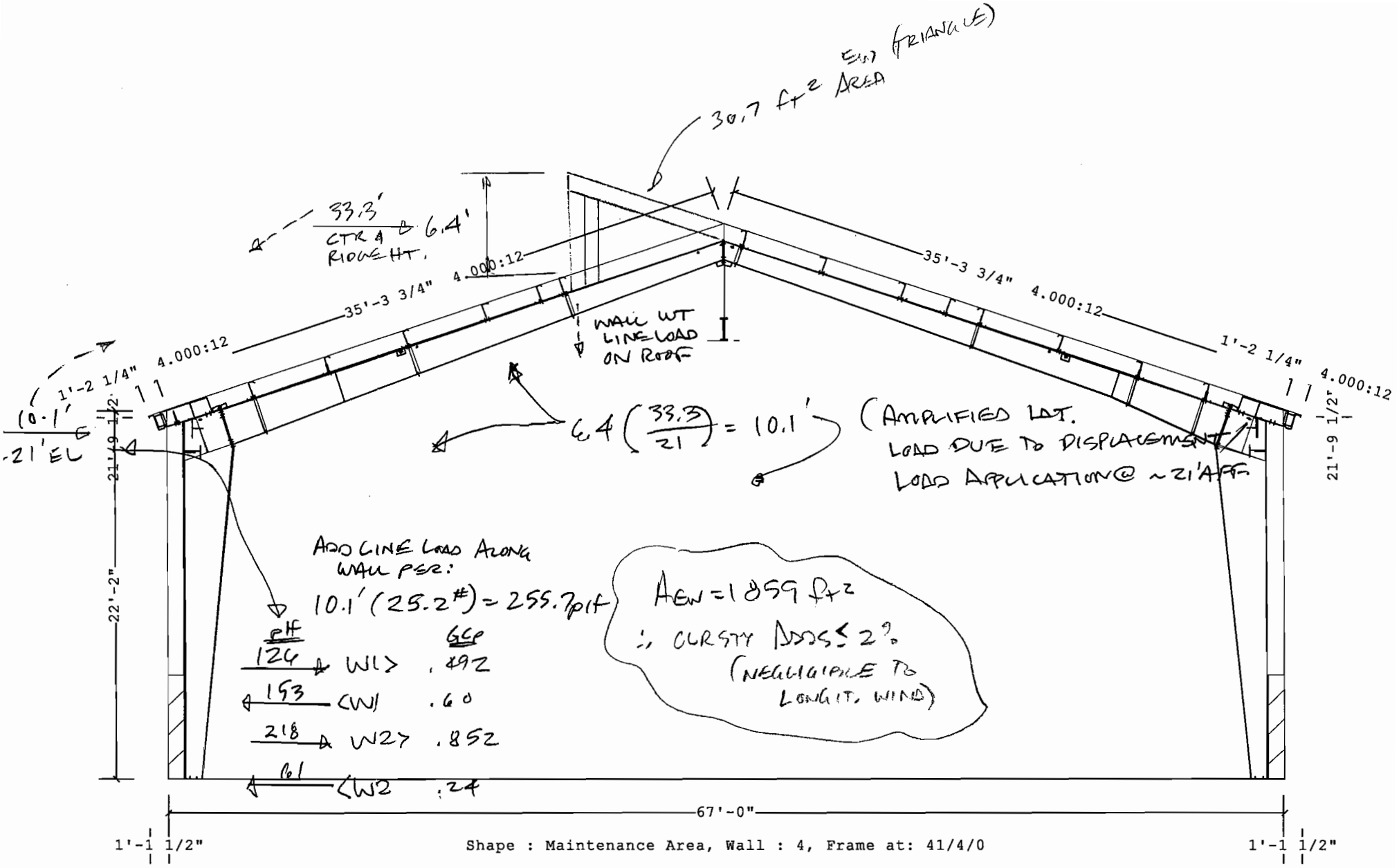
LATERAL WIND DUE TO VPPER SHAPE ABOVE ROOF LINE.

WALL WEIGHT

REPLACE LOADS AT ROOF OPENING COVED IN FOR THE CLERESTORY.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | RC | psf | L | Upper Roof | 20.00 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.50 | 103/9/8 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.50 | 103/9/8 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.50 | 0/0/0 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.50 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 25.20 | 103/9/8 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 25.20 | 103/9/8 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 25.20 | 0/0/0 | -9/11/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 25.20 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |

NEXT (4) PAGES ARE WORK SHEETS TO ILLUSTRATE LOADING APPLIED & SOME HAND DESIGN OVERRIDE OF COMPUTER RESULTS




Shape : Maintenance Area, Wall : 4, Frame at: 41/4/0

Window support beam

```
 Design Data:
     AXIAL      =   -1.00 K
     SHEAR      =    1.00 K
     X MOMENT   =   95.00 "-K
     KLX        =   30.00 FT
     KLY        =   30.00 FT
     LB         =   30.00 FT
     RT         =    0.00
     CB         =    1.00
     CMX        =    1.00
     FLANGE FY  =   55.00 KSI
     WEB FY     =   55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.2500 X  8.0 FLG   0.1345 WEB    9.00 DEPTH
     AREA   =    5.14
     IX     =   83.47    SX =  18.55    RX =   4.03    ZX =  19.93
     IY     =   21.34    SY =   5.33    RY =   2.04    ZY =   8.04
     QS     =    0.78
     QA     =    1.00
     WEIGHT =   17.50 #/FT

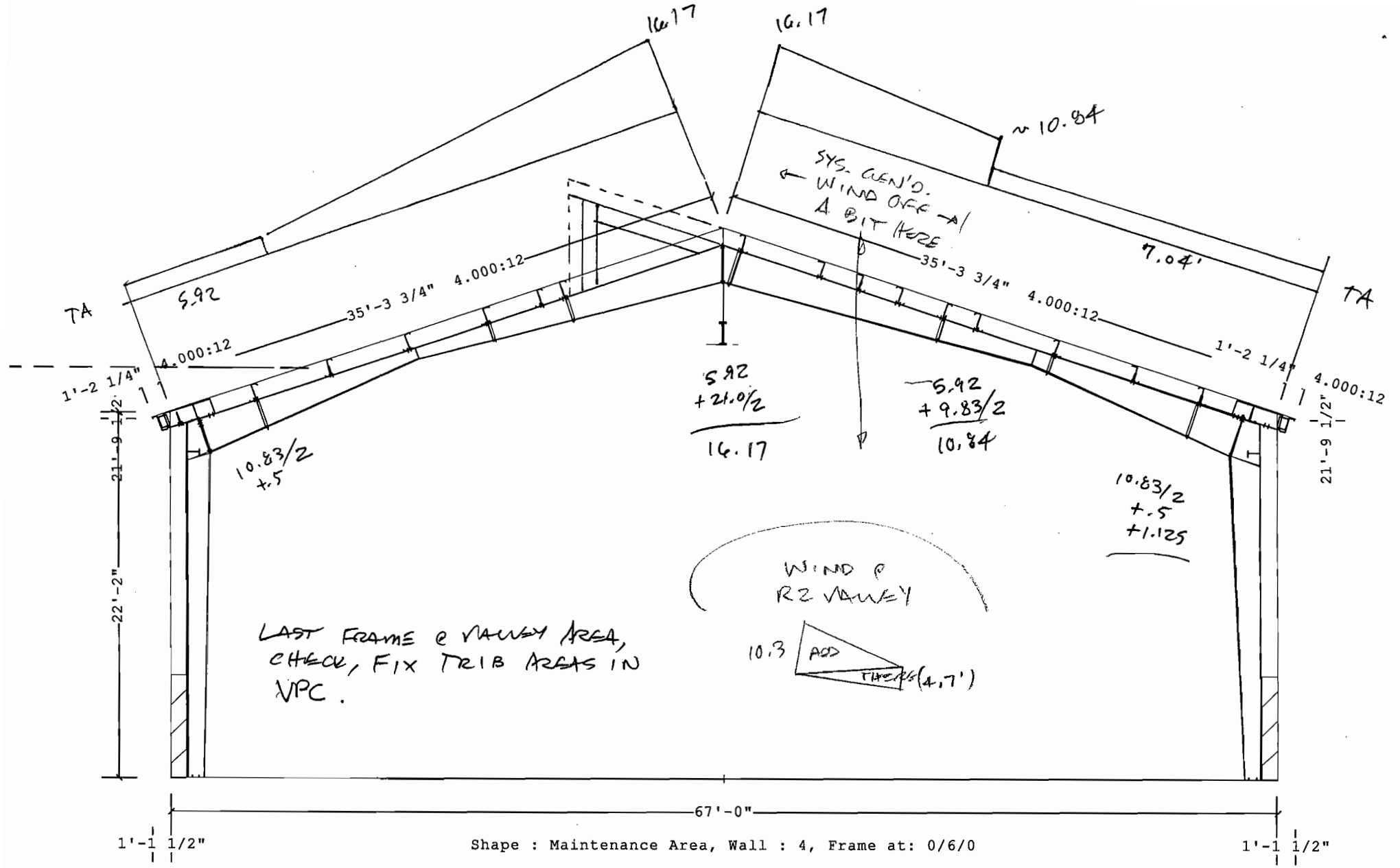
     FORCES
     ACTUAL P =     1.00 K          ALLOWABLE P =    24.79 K
           MX =    95.00 "-K                MX =   180.06 "-K
            V =     1.00 K                   V =    21.42 K
     COMBINED STRESS RATIO =  0.319
     SHEAR    STRESS RATIO =  0.047
```

≤ 7' HIGH WALL @ CLERESTORY. ASSUME 10 psf DL FOR WINDOW, FRAMING, ETC.

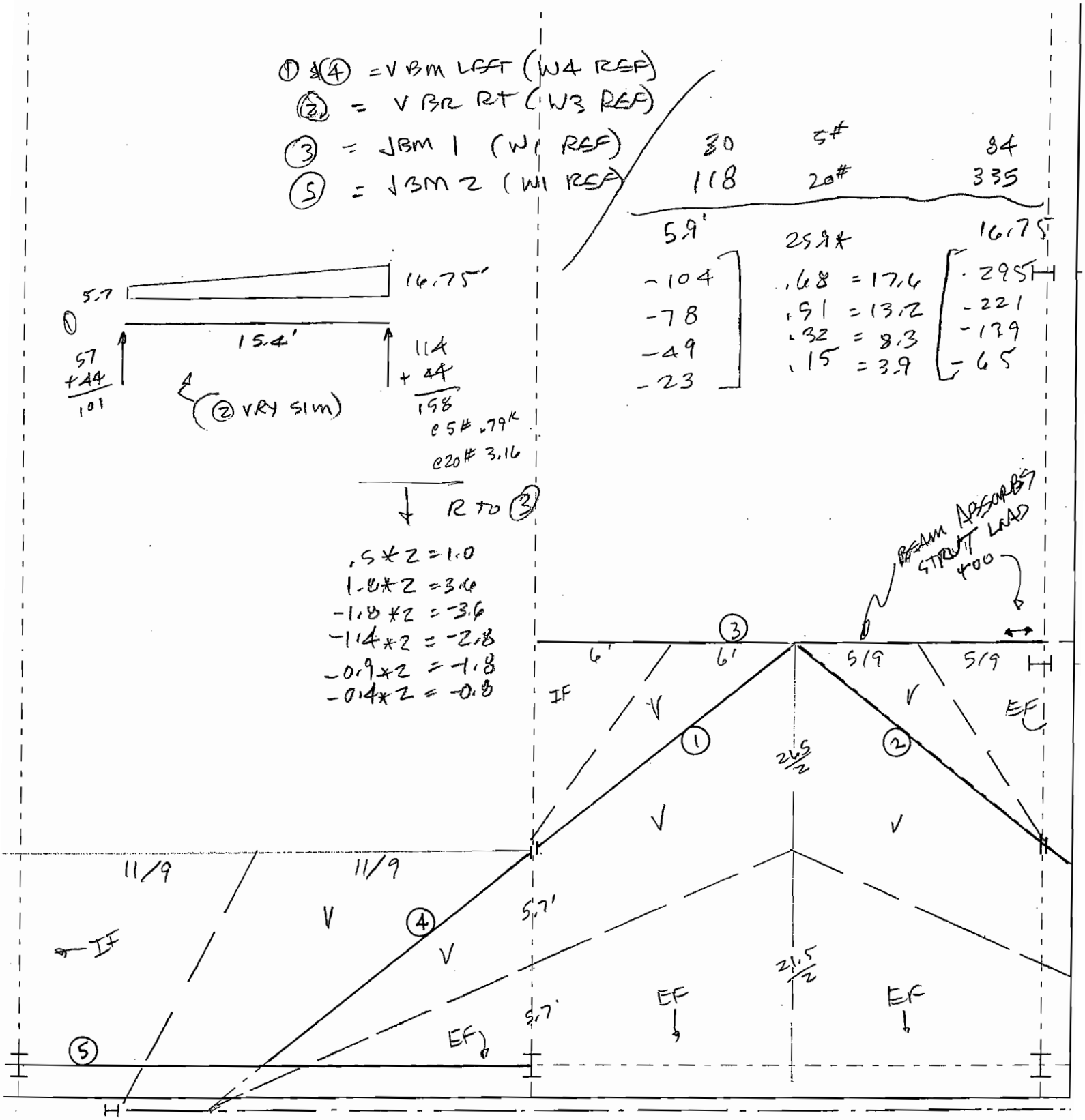
7 (10#) = 70 plf, 30' SPAN ⇒ MX = 95 in-k

V = 1.1 K

• USED L/600 MAX Δ = 0.6", IREQ'D = 73.




Shape : Maintenance Area, Wall : 4, Frame at: 0/6/0



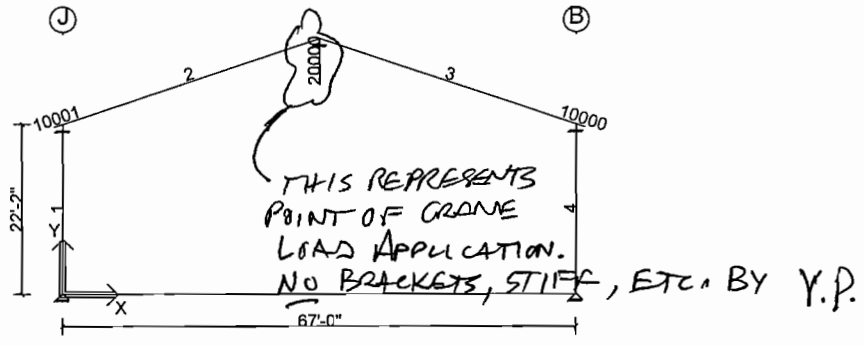

VALLEY LAKES & EPZ PORTION

**User Defined Frame Point Loads for Cross Section: 9**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 746.95 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 1292.35 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -907.02 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -361.62 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -206.78 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 9**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Valley | -36.30 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Valley | -209.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Valley | -209.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Valley | -209.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Valley | -26.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Valley | -26.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Valley | -26.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Valley | 203.00 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | <W1 | Valley | 158.00 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | W2> | Valley | 107.60 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | <W2 | Valley | 63.20 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -20.49 | 0/0/0 | -20.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -118.22 | 0/0/0 | -118.15 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -118.22 | 0/0/0 | -118.15 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -118.22 | 0/0/0 | -118.15 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 114.39 | 0/0/0 | 114.33 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 89.37 | 0/0/0 | 89.32 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 60.77 | 0/0/0 | 60.74 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 35.75 | 0/0/0 | 35.73 | 9/11/3 | N | UP | 0.240 | OF |
| 3 | plf | W1> | Fix Valley | 100.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | <W1 | Fix Valley | 164.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | W2> | Fix Valley | 100.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | <W2 | Fix Valley | 163.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | WP | Fix Valley | 180.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |

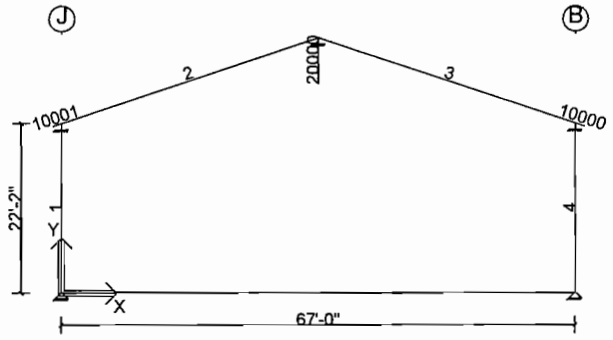


**User Defined Frame Point Loads for Cross Section: 10**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2572.50 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 4450.83 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -3123.75 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1245.42 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -714.58 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 10**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -70.76 | 0/0/0 | -70.76 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -408.33 | 0/0/0 | -408.33 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -408.33 | 0/0/0 | -408.33 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -408.33 | 0/0/0 | -408.33 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 395.12 | 0/0/0 | 395.12 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 308.69 | 0/0/0 | 308.69 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 209.90 | 0/0/0 | 209.90 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 123.47 | 0/0/0 | 123.47 | 9/11/3 | N | UP | 0.240 | OF |

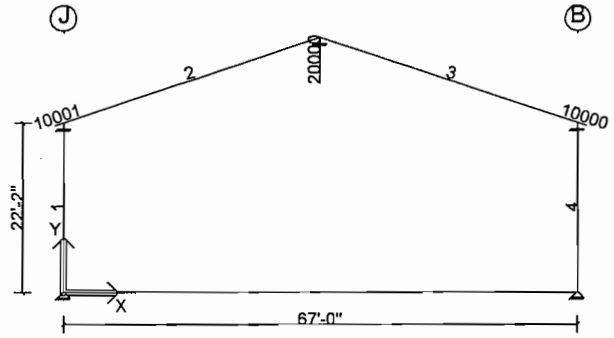


**User Defined Frame Point Loads for Cross Section: 11**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 3780.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 6540.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -4590.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1830.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -1050.00 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 11**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -103.98 | 0/0/0 | -103.98 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 580.59 | 0/0/0 | 580.59 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 453.59 | 0/0/0 | 453.59 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 308.43 | 0/0/0 | 308.43 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 181.43 | 0/0/0 | 181.43 | 9/11/3 | N | UP | 0.240 | OF |

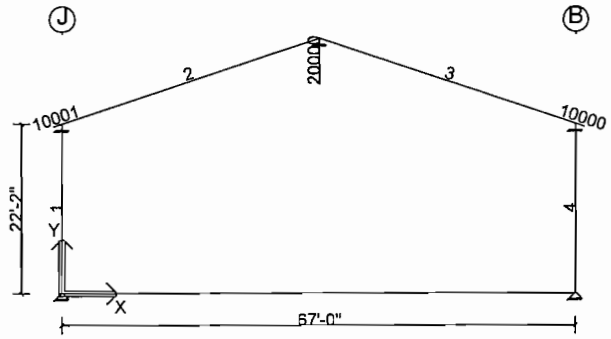


**User Defined Frame Point Loads for Cross Section: 12**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 3753.75 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 6494.58 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -4558.12 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1817.29 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -1042.71 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 12**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -103.26 | 0/0/0 | -103.26 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -595.83 | 0/0/0 | -595.83 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -595.83 | 0/0/0 | -595.83 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -595.83 | 0/0/0 | -595.83 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 576.56 | 0/0/0 | 576.56 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 450.44 | 0/0/0 | 450.44 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 306.29 | 0/0/0 | 306.29 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 180.17 | 0/0/0 | 180.17 | 9/11/3 | N | UP | 0.240 | OF |

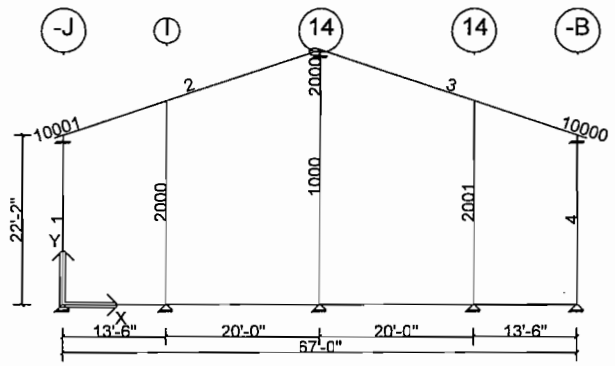


**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2005.83 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 3470.40 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -2435.65 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -971.07 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -580.77 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -57.51 | 0/0/0 | -57.51 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -331.87 | 0/0/0 | -331.87 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -331.87 | 0/0/0 | -331.87 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -331.87 | 0/0/0 | -331.87 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 321.13 | 0/0/0 | 321.13 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 250.88 | 0/0/0 | 250.88 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 170.60 | 0/0/0 | 170.60 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 100.35 | 0/0/0 | 100.35 | 9/11/3 | N | UP | 0.240 | OF |



## Shape: Clerestory Frames

**Loads and Codes – Shape: Clerestory Frames**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC – ASD
Cold Form: 04AISI – ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.575)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 4/9/8
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 21.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response – Ss:11.80 %g
Mapped Spectral Response – S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.0981
Bracing Seismic Period: 0.0648
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Underhung Crane
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations – Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |

| | | | | |
|---|---|---|---|---|
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Design Load Combinations – Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations – Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 6) |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 6) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 20 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 21 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 23 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations – Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |

**Design Load Combinations – Roof – Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 L | D + L |
| 2 | System | 1.000 | 1.0 D + 1.0 S | D + S |
| 3 | System | 1.000 | 1.0 D + 1.0 W1> | D + W1> |
| 4 | System | 1.000 | 1.0 D + 1.0 <W2 | D + <W2 |
| 5 | System | 1.000 | 0.600 D + 1.0 W1> | D + W1> |
| 6 | System | 1.000 | 0.600 D + 1.0 <W2 | D + <W2 |

**Design Load Combinations – Wall – Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |

**Deflection Load Combinations – Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 100 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 100 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 100 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 100 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 100 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 100 | 0 | 0.600 E> + 0.600 EG- | E> + EG- |
| 14 | System | 1.000 | 100 | 0 | 0.600 <E + 0.600 EG- | <E + EG- |

**Deflection Load Combinations – Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations – Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |

**Deflection Load Combinations – Roof – Panel**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 1.0 S | S |

## Reactions – Summary Report

### Shape: Maintenance Area

Builder Contact: Mr. Roy Mouledous
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State Zip: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State Zip: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

**Loads and Codes – Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC – ASD
Cold Form: 04AISI – ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**

Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**

Live Load: 20.00 psf Not Reducible

**Wind Load**

Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**

Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**

Mapped Spectral Response – Ss:11.80 %g
Mapped Spectral Response – S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Load Type Descriptions**

| | | | |
|---|---|---|---|
| D | Material Dead Weight | C | Collateral Load |
| CG | Collateral Load for Gravity Cases | CU | Collateral Load for Wind Cases |
| L | Live Load | ASL^ | Alternate Span Live Load, Shifted Right |
| ^ASL | Alternate Span Live Load, Shifted Left | PL2 | Partial Live, Full, 2 Spans |
| L> | Live – Notional Right | <L | Live – Notional Left |
| S | Snow Load | US1* | Unbalanced Snow Load 1, Shifted Right |
| *US1 | Unbalanced Snow Load 1, Shifted Left | US2* | Unbalanced Snow Load 2, Shifted Right |
| *US2 | Unbalanced Snow Load 2, Shifted Left | SD | Snow Drift Load |
| SS | Sliding Snow Load | RS | Rain Surcharge Load |
| PF1 | Partial Load, Full, 1 Span | PH1 | Partial Load, Half, 1 Span |
| PF2 | Partial Load, Full, 2 Spans | PH2 | Partial Load, Half, 2 Spans |
| S> | Snow – Notional Right | <S | Snow – Notional Left |
| MRS | Minimum Roof Snow | MRS> | Minimum Roof Snow – Notional Right |
| <MRS | Minimum Roof Snow – Notional Left | W | Wind Load |
| W1> | Wind Load, Case 1, Right | <W1 | Wind Load, Case 1, Left |
| W2> | Wind Load, Case 2, Right | <W2 | Wind Load, Case 2, Left |
| W3> | Wind Load, Case 3, Right | <W3 | Wind Load, Case 3, Left |
| W4> | Wind Load, Case 4, Right | <W4 | Wind Load, Case 4, Left |
| W5> | Wind Load, Case 5, Right | <W5 | Wind Load, Case 5, Left |
| W6> | Wind Load, Case 6, Right | <W6 | Wind Load, Case 6, Left |
| WP | Wind Load, Parallel to Ridge | WPR | Wind Load, \|\| Ridge, Right |
| WPL | Wind Load, \|\| Ridge, Left | WPA1 | Wind Parallel – Ref A, Case 1 |
| WPA2 | Wind Parallel – Ref A, Case 2 | WPB1 | Wind Parallel – Ref B, Case 1 |
| WPB2 | Wind Parallel – Ref B, Case 2 | WPC1 | Wind Parallel – Ref C, Case 1 |

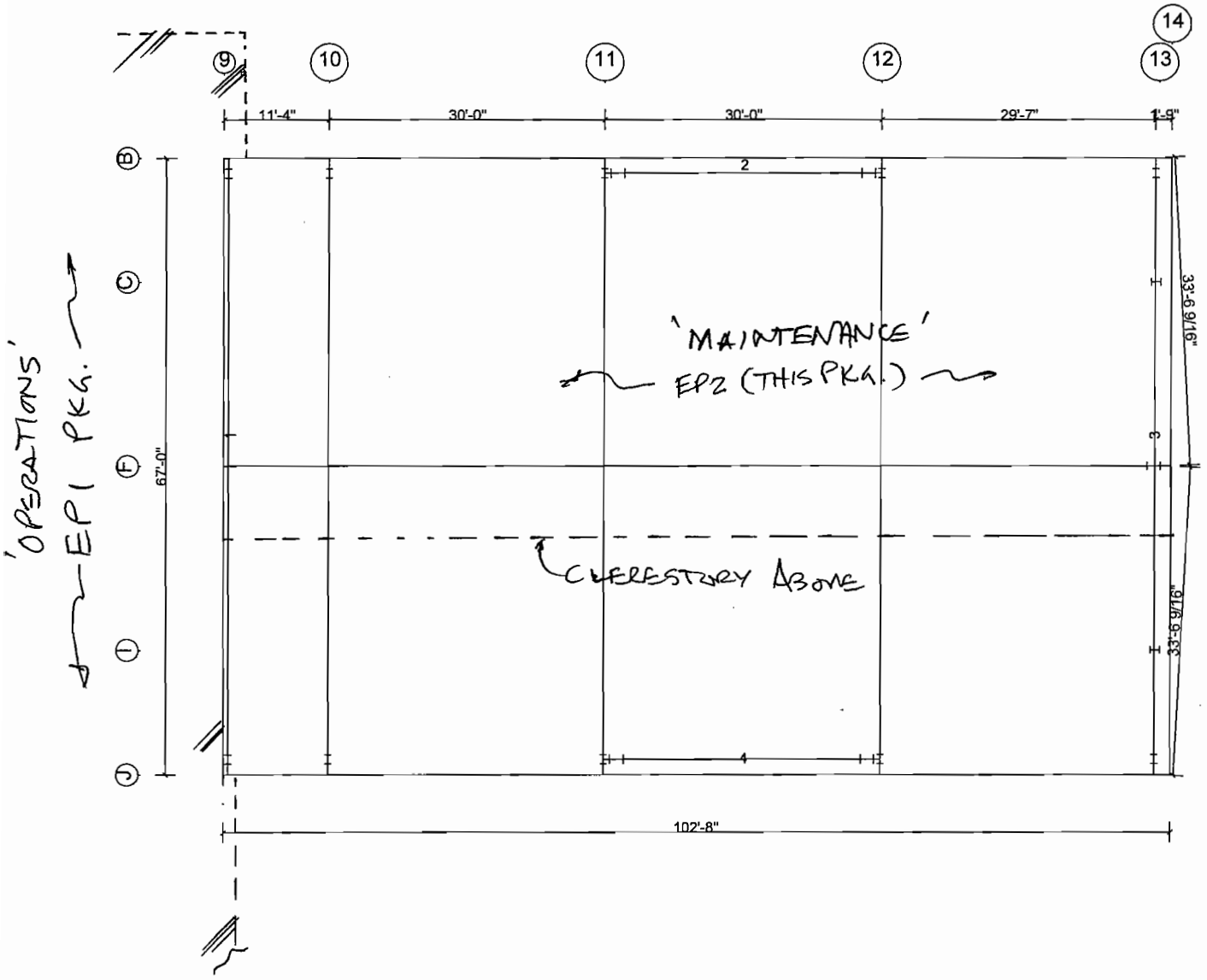
| | |
|---|---|
| WPC2 | Wind Parallel – Ref C, Case 2 |
| WPD2 | Wind Parallel – Ref D, Case 2 |
| <WB1 | Wind Brace Reaction, Case 1, Left |
| <WB2 | Wind Brace Reaction, Case 2, Left |
| <WB3 | Wind Brace Reaction, Case 3, Left |
| <WB4 | Wind Brace Reaction, Case 4, Left |
| <WB5 | Wind Brace Reaction, Case 5, Left |
| <WB6 | Wind Brace Reaction, Case 6, Left |
| MWB | Minimum Wind Bracing Reaction |
| E> | Seismic Load, Right |
| EG | Vertical Seismic Effect |
| EG- | Vertical Seismic Effect, Subtractive |
| <EB | Seismic Brace Reaction, Left |
| FL* | Alternate Span Floor Live Load, Shifted Right |
| FD | Floor Dead Load |
| AL*> | Auxiliary Live Load, Right, Right |
| <AL* | Auxiliary Live Load, Left, Right |
| AL* | Aux Live, Right |
| AL*>(1) | Auxiliary Live Load, Right, Right, Aisle 1 |
| <AL*(1) | Auxiliary Live Load, Left, Right, Aisle 1 |
| AL*(1) | Aux Live, Right, Aisle 1 |
| AL*>(2) | Auxiliary Live Load, Right, Right, Aisle 2 |
| <AL*(2) | Auxiliary Live Load, Left, Right, Aisle 2 |
| AL*(2) | Aux Live, Right, Aisle 2 |
| AL*>(3) | Auxiliary Live Load, Right, Right, Aisle 3 |
| <AL*(3) | Auxiliary Live Load, Left, Right, Aisle 3 |
| AL*(3) | Aux Live, Right, Aisle 3 |
| AL*>(4) | Auxiliary Live Load, Right, Right, Aisle 4 |
| <AL*(4) | Auxiliary Live Load, Left, Right, Aisle 4 |
| AL*(4) | Aux Live, Right, Aisle 4 |
| AL*>(5) | Auxiliary Live Load, Right, Right, Aisle 5 |
| <AL*(5) | Auxiliary Live Load, Left, Right, Aisle 5 |
| AL*(5) | Aux Live, Right, Aisle 5 |
| ALB | Aux Live Bracing Reaction |
| <ALB | Aux Live Bracing Reaction, Left |
| <WALB | Wind, Aux Live Bracing Reaction, Left |
| <ALB(1) | Aux Live Bracing Reaction, Left, Aisle 1 |
| <WALB(1) | Wind, Aux Live Bracing Reaction, Left, Aisle 1 |
| <ALB(2) | Aux Live Bracing Reaction, Left, Aisle 2 |
| <WALB(2) | Wind, Aux Live Bracing Reaction, Left, Aisle 2 |
| <ALB(3) | Aux Live Bracing Reaction, Left, Aisle 3 |
| <WALB(3) | Wind, Aux Live Bracing Reaction, Left, Aisle 3 |
| <ALB(4) | Aux Live Bracing Reaction, Left, Aisle 4 |
| <WALB(4) | Wind, Aux Live Bracing Reaction, Left, Aisle 4 |
| <ALB(5) | Aux Live Bracing Reaction, Left, Aisle 5 |
| <WALB(5) | Wind, Aux Live Bracing Reaction, Left, Aisle 5 |
| AD | Auxiliary Dead Load |
| U1 | User Defined Load – 1 |
| U3 | User Defined Load – 3 |
| U5 | User Defined Load – 5 |
| U7 | User Defined Load – 7 |
| U9 | User Defined Load – 9 |
| UB1 | User Brace Reaction – 1 |
| UB3 | User Brace Reaction – 3 |
| UB5 | User Brace Reaction – 5 |
| UB7 | User Brace Reaction – 7 |
| UB9 | User Brace Reaction – 9 |
| T | Temperature Load |
| WPD1 | Wind Parallel – Ref D, Case 1 |
| WB1> | Wind Brace Reaction, Case 1, Right |
| WB2> | Wind Brace Reaction, Case 2, Right |
| WB3> | Wind Brace Reaction, Case 3, Right |
| WB4> | Wind Brace Reaction, Case 4, Right |
| WB5> | Wind Brace Reaction, Case 5, Right |
| WB6> | Wind Brace Reaction, Case 6, Right |
| MW | Minimum Wind Load |
| E | Seismic Load |
| <E | Seismic Load, Left |
| EG+ | Vertical Seismic Effect, Additive |
| EB> | Seismic Brace Reaction, Right |
| FL | Floor Live Load |
| *FL | Alternate Span Floor Live Load, Shifted Left |
| AL | Auxiliary Live Load |
| *AL> | Auxiliary Live Load, Right, Left |
| <*AL | Auxiliary Live Load, Left, Left |
| *AL | Aux Live, Left |
| *AL>(1) | Auxiliary Live Load, Right, Left, Aisle 1 |
| <*AL(1) | Auxiliary Live Load, Left, Left, Aisle 1 |
| *AL(1) | Aux Live, Left, Aisle 1 |
| *AL>(2) | Auxiliary Live Load, Right, Left, Aisle 2 |
| <*AL(2) | Auxiliary Live Load, Left, Left, Aisle 2 |
| *AL(2) | Aux Live, Left, Aisle 2 |
| *AL>(3) | Auxiliary Live Load, Right, Left, Aisle 3 |
| <*AL(3) | Auxiliary Live Load, Left, Left, Aisle 3 |
| *AL(3) | Aux Live, Left, Aisle 3 |
| *AL>(4) | Auxiliary Live Load, Right, Left, Aisle 4 |
| <*AL(4) | Auxiliary Live Load, Left, Left, Aisle 4 |
| *AL(4) | Aux Live, Left, Aisle 4 |
| *AL>(5) | Auxiliary Live Load, Right, Left, Aisle 5 |
| <*AL(5) | Auxiliary Live Load, Left, Left, Aisle 5 |
| *AL(5) | Aux Live, Left, Aisle 5 |
| ALB> | Aux Live Bracing Reaction, Right |
| WALB> | Wind, Aux Live Bracing Reaction, Right |
| ALB>(1) | Aux Live Bracing Reaction, Right, Aisle 1 |
| WALB>(1) | Wind, Aux Live Bracing Reaction, Right, Aisle 1 |
| ALB>(2) | Aux Live Bracing Reaction, Right, Aisle 2 |
| WALB>(2) | Wind, Aux Live Bracing Reaction, Right, Aisle 2 |
| ALB>(3) | Aux Live Bracing Reaction, Right, Aisle 3 |
| WALB>(3) | Wind, Aux Live Bracing Reaction, Right, Aisle 3 |
| ALB>(4) | Aux Live Bracing Reaction, Right, Aisle 4 |
| WALB>(4) | Wind, Aux Live Bracing Reaction, Right, Aisle 4 |
| ALB>(5) | Aux Live Bracing Reaction, Right, Aisle 5 |
| WALB>(5) | Wind, Aux Live Bracing Reaction, Right, Aisle 5 |
| WALB | Wind, Aux Live Bracing Reaction |
| U0 | User Defined Load |
| U2 | User Defined Load – 2 |
| U4 | User Defined Load – 4 |
| U6 | User Defined Load – 6 |
| U8 | User Defined Load – 8 |
| UB | User Brace Reaction |
| UB2 | User Brace Reaction – 2 |
| UB4 | User Brace Reaction – 4 |
| UB6 | User Brace Reaction – 6 |
| UB8 | User Brace Reaction – 8 |
| R | Rain Load |
| V | Shear |

**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Maintenance Area | 67/0/0 | 102/8/0 | 6879 | 8270 | 8076 | 22/2/0 | 22/2/0 | 4.000:12 | 4.000:12 | 33/4/0 |
| ** Clerestory Shape ** | 67/0/0 | 102/8/0 | 6879 | 8909 | 7933 | 36/6/6 | 22/2/0 | 4.000:12 | 4.000:12 | 36/6/6 |
| Clerestory Frames | 9/7/1 | 102/8/0 | 984 | 1076 | 1059 | 6/4/11 | 3/2/5 | 4.000:12 | | |
| Total For All Shapes | | | 14742 | 18255 | 17068 | ** 'Clerestory Shape' is for supplemental use only ** | | | | |

**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | 9-B | 9-J | 67/0/0 | 102/8/0 | 22/2/0 | 22/2/0 | 4.000:12 | 4.000:12 | 33/6/0 | 33/4/0 |



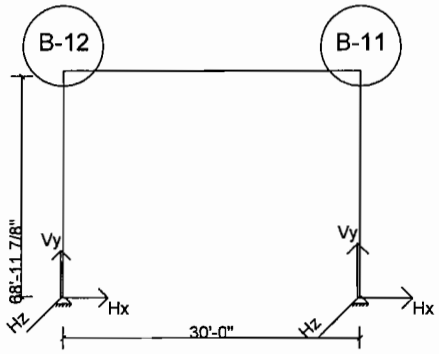
## Wall: 2

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Wall: 2**
Frame ID:Portal Frame

Frame Type:Portal Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B**

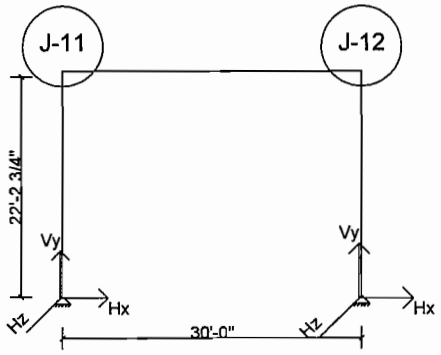
| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 30/0/0 | | | | |
| Grid1 - Grid2 | | B-12 | | B-11 | | | | |
| Base Plate W x L (in.) | | 13 x 19 | | 13 x 19 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 1.7 | -0.1 | 1.7 | - | - | - |
| AD | Frm | - | - | - | - | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | - | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | - | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | 4.2 | 6.4 | 4.0 | -6.4 | - | - | - |
| <WB1 | Brc | -3.5 | -5.6 | -3.7 | 5.6 | - | - | - |
| WB2> | Brc | 2.4 | 3.7 | 2.3 | -3.7 | - | - | - |
| <WB2 | Brc | -5.2 | -8.3 | -5.4 | 8.3 | - | - | - |
| EB> | Brc | 1.0 | 1.5 | 0.9 | -1.5 | - | - | - |
| <EB | Brc | -0.9 | -1.5 | -1.0 | 1.5 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B-12 | 5.1 | 48 | 4.3 | 35 | - | - | - | - | 7.3 | 48 | 8.1 | 35 | - | - | - | - |
| 30/0/0 | B-11 | 5.5 | 47 | 3.9 | 36 | - | - | - | - | 5.4 | 36 | 10.0 | 47 | - | - | - | - |

**Wall: 4**
Frame ID:Portal Frame

Frame Type:Portal Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: J**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 30/0/0 | | | | |
| Grid1 - Grid2 | | J-11 | | J-12 | | | | |
| Base Plate W x L (in.) | | 13 x 19 | | 13 x 19 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 1.7 | -0.1 | 1.7 | - | - | - |
| AD | Frm | - | - | - | - | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | - | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | - | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | -3.6 | -5.8 | -3.8 | 5.8 | - | - | - |
| <WB1 | Brc | 3.2 | 4.9 | 3.0 | -4.9 | - | - | - |
| WB2> | Brc | -1.7 | -2.7 | -1.7 | 2.7 | - | - | - |
| <WB2 | Brc | 5.2 | 8.0 | 5.0 | -8.0 | - | - | - |
| EB> | Brc | -0.9 | -1.5 | -1.0 | 1.5 | - | - | - |
| <EB | Brc | 1.0 | 1.5 | 0.9 | -1.5 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | J-11 | 3.5 | 36 | 5.3 | 47 | - | - | - | - | 4.8 | 36 | 9.7 | 47 | - | - | - | - |
| 30/0/0 | J-12 | 3.9 | 35 | 4.9 | 48 | - | - | - | - | 7.0 | 48 | 7.5 | 35 | - | - | - | - |

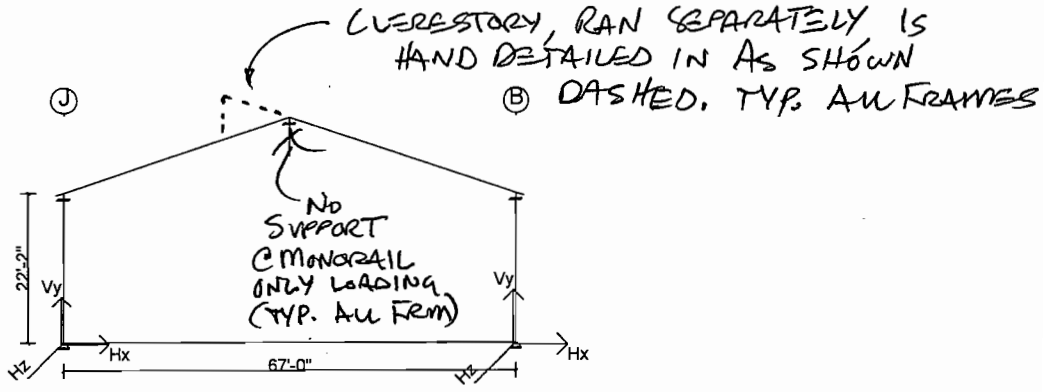
**Wall: 4, Frame at: 0/6/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL | D + AD + CG + WP+AL |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 36 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 37 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Wall: 4, Frame at: 0/6/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 9**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 9-J | | 9-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.8 | 2.5 | -0.8 | 2.5 | - | - | - |
| AD | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| CG | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| L> | Frm | 3.3 | 8.4 | -3.3 | 7.7 | - | - | - |
| <L | Frm | 3.3 | 8.4 | -3.3 | 7.7 | - | - | - |
| S> | Frm | 0.4 | 1.1 | -0.4 | 1.0 | - | - | - |
| <S | Frm | 0.4 | 1.1 | -0.4 | 1.0 | - | - | - |
| US1* | Frm | 0.4 | 0.7 | -0.4 | 1.1 | - | - | - |
| *US1 | Frm | 0.3 | 0.7 | -0.3 | 0.5 | - | - | - |
| W1> | Frm | -3.9 | -6.3 | 0.2 | -4.5 | - | - | - |
| <W1 | Frm | -0.3 | -4.8 | 4.0 | -7.3 | - | - | - |
| W2> | Frm | -4.1 | -4.2 | -0.5 | -1.9 | - | - | - |
| <W2 | Frm | -0.5 | -2.7 | 3.3 | -4.8 | - | - | - |
| WP | Frm | -1.1 | -4.8 | -0.4 | -5.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.3 | 2.4 | -1.3 | 2.4 | - | - | - |
| L | Frm | 2.6 | 6.6 | -2.6 | 6.7 | - | - | - |
| S | Frm | 0.3 | 0.8 | -0.3 | 0.9 | - | - | - |
| E> | Frm | -0.2 | -0.2 | -0.2 | 0.2 | - | - | - |
| EG+ | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| <E | Frm | 0.2 | 0.2 | 0.2 | -0.2 | - | - | - |
| EG- | Frm | -0.0 | -0.1 | 0.0 | -0.1 | - | - | - |

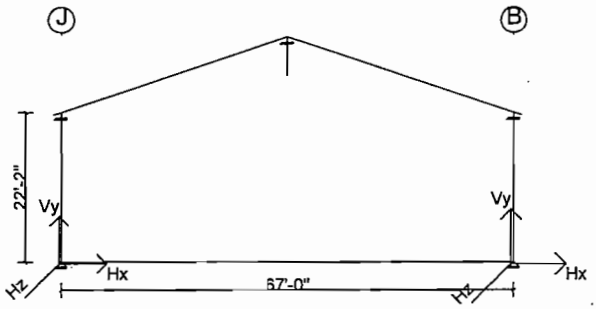
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 9-J | 3.6 | 14 | 4.9 | 1 | - | - | - | - | 4.8 | 12 | 12.7 | 1 | - | - | - | - |
| 67/0/0 | 9-B | 4.9 | 1 | 3.5 | 13 | - | - | - | - | 5.8 | 13 | 12.1 | 1 | - | - | - | - |

**Wall: 4, Frame at: 11/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 10**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 10-J | | 10-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.5 | 4.4 | -1.5 | 4.4 | - | - | - |
| AD | Frm | 0.2 | 0.3 | -0.2 | 0.3 | - | - | - |
| CG | Frm | 1.7 | 4.0 | -1.7 | 3.8 | - | - | - |
| L> | Frm | 6.0 | 14.1 | -6.0 | 14.1 | - | - | - |
| <L | Frm | 6.0 | 14.1 | -6.0 | 14.1 | - | - | - |
| S> | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| <S | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| US1* | Frm | 1.0 | 1.5 | -1.0 | 2.2 | - | - | - |
| *US1 | Frm | 0.5 | 1.5 | -0.5 | 0.8 | - | - | - |
| W1> | Frm | -11.6 | -15.7 | -2.1 | -8.6 | - | - | - |
| <W1 | Frm | 3.3 | -8.3 | 11.2 | -15.8 | - | - | - |
| W2> | Frm | -12.7 | -10.2 | -3.0 | -1.9 | - | - | - |
| <W2 | Frm | 2.2 | -2.9 | 10.4 | -9.1 | - | - | - |
| WP | Frm | -0.0 | -11.9 | -1.7 | -12.4 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.8 | 2.4 | -1.8 | 2.4 | - | - | - |
| L | Frm | 6.0 | 14.1 | -6.0 | 14.1 | - | - | - |
| S | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| E> | Frm | -0.6 | -0.4 | -0.6 | 0.4 | - | - | - |
| EG+ | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| <E | Frm | 0.6 | 0.4 | 0.6 | -0.4 | - | - | - |
| EG- | Frm | -0.1 | -0.2 | 0.1 | -0.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 10-J | 11.7 | 14 | 10.4 | 19 | - | - | - | - | 12.9 | 12 | 22.8 | 1 | - | - | - | - |
| 67/0/0 | 10-B | 10.1 | 20 | 10.2 | 13 | - | - | - | - | 13.0 | 13 | 22.6 | 1 | - | - | - | - |

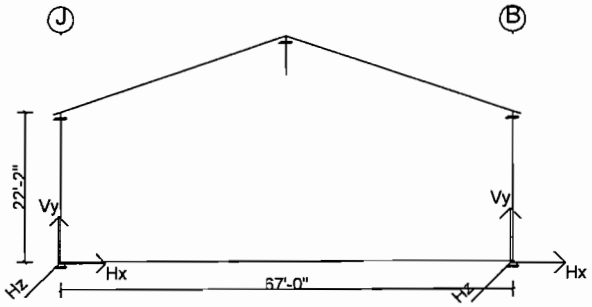
**Wall: 4, Frame at: 41/4/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Wall: 4, Frame at: 41/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 11**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 11-J | | 11-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 1.000 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 2.0 | 5.8 | -2.0 | 5.8 | - | - | - |
| AD | Frm | 0.3 | 0.4 | -0.3 | 0.4 | - | - | - |
| CG | Frm | 2.5 | 5.9 | -2.5 | 5.6 | - | - | - |
| L> | Frm | 8.7 | 20.8 | -8.7 | 20.8 | - | - | - |
| <L | Frm | 8.7 | 20.8 | -8.7 | 20.8 | - | - | - |
| S> | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| <S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| US1* | Frm | 1.4 | 2.2 | -1.4 | 3.2 | - | - | - |
| *US1 | Frm | 0.7 | 2.2 | -0.7 | 1.2 | - | - | - |
| W1> | Frm | -16.9 | -23.0 | -3.1 | -12.6 | - | - | - |
| <W1 | Frm | 4.9 | -12.2 | 16.5 | -23.1 | - | - | - |
| W2> | Frm | -18.5 | -14.9 | -4.5 | -2.8 | - | - | - |
| <W2 | Frm | 3.3 | -4.2 | 15.2 | -13.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.7 | 2.4 | -1.7 | 2.4 | - | - | - |
| L | Frm | 8.7 | 20.8 | -8.7 | 20.8 | - | - | - |
| S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| E> | Frm | -0.9 | -0.5 | -0.9 | 0.5 | - | - | - |
| EG+ | Frm | 0.1 | 0.3 | -0.1 | 0.3 | - | - | - |
| <E | Frm | 0.9 | 0.5 | 0.9 | -0.5 | - | - | - |
| EG- | Frm | -0.1 | -0.3 | 0.1 | -0.3 | - | - | - |
| WP | Frm | 1.7 | -14.1 | -3.4 | -14.1 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

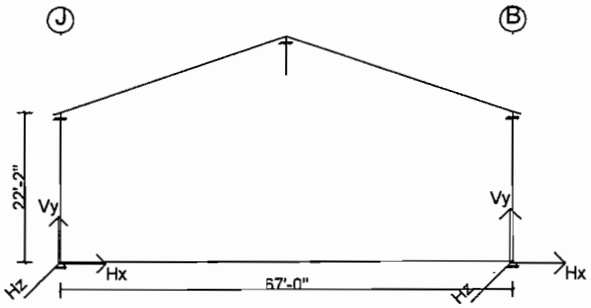
| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 11-J | 17.1 | 13 | 15.0 | 17 | - | - | - | - | 19.2 | 11 | 32.9 | 1 | - | - | - | - |
| 67/0/0 | 11-B | 14.7 | 18 | 15.1 | 12 | - | - | - | - | 19.4 | 12 | 32.6 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | 11-J | Portal Frame is next to column. See portal frame section for reactions |
| 67/0/0 | 11-B | Portal Frame is next to column. See portal frame section for reactions |

**Wall: 4, Frame at: 71/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 12**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 12-J | | 12-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 1.000 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 2.0 | 5.8 | -2.0 | 5.8 | - | - | - |
| AD | Frm | 0.3 | 0.4 | -0.3 | 0.4 | - | - | - |
| CG | Frm | 2.5 | 5.8 | -2.5 | 5.5 | - | - | - |
| L> | Frm | 8.6 | 20.6 | -8.6 | 20.6 | - | - | - |
| <L | Frm | 8.6 | 20.6 | -8.6 | 20.6 | - | - | - |
| S> | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| <S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| US1* | Frm | 1.4 | 2.2 | -1.4 | 3.2 | - | - | - |
| *US1 | Frm | 0.7 | 2.2 | -0.7 | 1.2 | - | - | - |
| W1> | Frm | -17.1 | -23.1 | -3.0 | -12.8 | - | - | - |
| <W1 | Frm | 4.4 | -12.5 | 16.5 | -23.4 | - | - | - |
| W2> | Frm | -18.5 | -14.9 | -4.4 | -2.9 | - | - | - |
| <W2 | Frm | 3.1 | -4.4 | 15.1 | -13.5 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.7 | 2.4 | -1.7 | 2.4 | - | - | - |
| L | Frm | 8.6 | 20.6 | -8.6 | 20.6 | - | - | - |
| S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| E> | Frm | -0.9 | -0.5 | -0.9 | 0.5 | - | - | - |
| EG+ | Frm | 0.1 | 0.3 | -0.1 | 0.3 | - | - | - |
| <E | Frm | 0.9 | 0.5 | 0.9 | -0.5 | - | - | - |
| EG- | Frm | -0.1 | -0.3 | 0.1 | -0.3 | - | - | - |
| WP | Frm | 0.8 | -16.4 | -2.5 | -15.5 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**
Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 12-J | 17.1 | 13 | 14.6 | 17 | - | - | - | - | 19.4 | 11 | 32.7 | 1 | - | - | - | - |
| 67/0/0 | 12-B | 14.6 | 18 | 15.1 | 12 | - | - | - | - | 19.7 | 12 | 32.4 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | 12-J | Portal Frame is next to column. See portal frame section for reactions |
| 67/0/0 | 12-B | Portal Frame is next to column. See portal frame section for reactions |

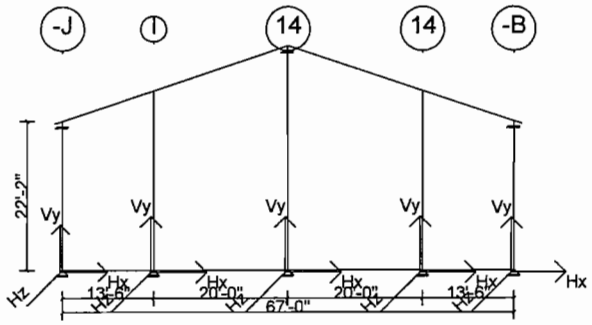
## Wall: 4, Frame at: 100/11/0

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL | D + AD + CG + WP+AL |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 36 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 37 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Wall: 4, Frame at: 100/11/0**
Frame ID:CB1 EP

Frame Type:Continuous Beam, End Posts




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Interior Column | | | Exterior Column | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 13/6/0 | | | 33/6/0 | | | 53/6/0 | | | 67/0/0 | |
| Grid1 - Grid2 | | -J | | 14-I | | | F-14 | | | C-14 | | | -B | |
| Base Plate W x L (in.) | | 9 x 13 | | 10 x 13 | | | 11 x 18 | | | 10 x 13 | | | 9 x 13 | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | | 0.375 | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy |
| D | Frm | 0.5 | 2.7 | - | - | 0.7 | - | - | 3.1 | - | - | 0.7 | -0.5 | 2.7 |
| AD | Frm | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - |
| CG | Frm | 0.5 | 2.1 | - | - | - | - | - | 2.6 | - | - | - | -0.5 | 2.0 |
| L> | Frm | 1.8 | 7.8 | - | - | - | - | - | 8.8 | - | - | - | -1.8 | 7.8 |
| <L | Frm | 1.8 | 7.8 | - | - | - | - | - | 8.8 | - | - | - | -1.8 | 7.8 |
| S> | Frm | 0.2 | 1.0 | - | - | - | - | - | 1.1 | - | - | - | -0.2 | 1.0 |
| <S | Frm | 0.2 | 1.0 | - | - | - | - | - | 1.1 | - | - | - | -0.2 | 1.0 |
| US1* | Frm | 0.2 | 0.4 | - | - | - | - | - | 1.8 | - | - | - | -0.2 | 1.0 |
| *US1 | Frm | 0.1 | 0.9 | - | - | - | - | - | 0.7 | - | - | - | -0.1 | 0.3 |
| W1> | Frm | -7.0 | -10.4 | - | 5.7 | - | - | 7.9 | -6.9 | - | 5.7 | - | -3.9 | -4.3 |
| <W1 | Frm | 4.1 | -5.0 | - | -5.1 | - | - | -7.1 | -5.6 | - | -5.1 | - | 7.1 | -11.2 |
| W2> | Frm | -8.3 | -6.4 | - | - | - | - | - | -5.7 | - | - | - | -4.1 | 0.6 |
| <W2 | Frm | 2.8 | -1.0 | - | - | - | - | - | -4.4 | - | - | - | 6.9 | -6.3 |
| WP | Frm | 0.1 | -11.5 | - | - | - | - | - | -2.1 | - | - | - | -1.4 | -10.8 |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AL | Frm | 0.0 | 0.0 | - | - | - | - | - | 4.7 | - | - | - | -0.0 | 0.0 |
| L | Frm | 1.8 | 7.8 | - | - | - | - | - | 8.8 | - | - | - | -1.8 | 7.8 |
| S | Frm | 0.2 | 1.0 | - | - | - | - | - | 1.1 | - | - | - | -0.2 | 1.0 |
| E> | Frm | -0.5 | -0.3 | - | 0.2 | - | - | 0.2 | - | - | 0.2 | - | -0.5 | 0.3 |
| EG+ | Frm | 0.0 | 0.1 | - | - | - | - | - | 0.1 | - | - | - | -0.0 | 0.1 |
| <E | Frm | 0.5 | 0.3 | - | -0.2 | - | - | -0.2 | - | - | -0.2 | - | 0.5 | -0.3 |
| EG- | Frm | -0.0 | -0.1 | - | - | - | - | - | -0.1 | - | - | - | 0.0 | -0.1 |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -J | 8.0 | 14 | 5.3 | 19 | - | - | - | - | 9.9 | 16 | 12.6 | 1 | - | - | - | - |
| 13/6/0 | 14-I | - | - | - | - | 5.1 | 8 | 5.7 | 7 | - | - | 0.7 | 1 | - | - | - | - |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33/6/0 | F-14 | - | - | - | - | 7.1 | 8 | 7.9 | 7 | 4.7 | 12 | 15.0 | 1 | - | - | - | - |
| 53/6/0 | C-14 | - | - | - | - | 5.1 | 8 | 5.7 | 7 | - | - | 0.7 | 1 | - | - | - | - |
| 67/0/0 | -B | 5.4 | 20 | 6.8 | 13 | - | - | - | - | 9.6 | 13 | 12.5 | 1 | - | - | - | - |

## Bracing - Summary Report

### Shape: Maintenance Area

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

**Crane Schedule Information**

| Name | Type | Service Classification | Method of Operation | Capacity (Ton) | Bridge Span | Bridge Construction |
|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | Monorail Crane | C (Moderate Service) | Pendant Operated | 2.00 | N/A | N/A |

**Wall: 4**

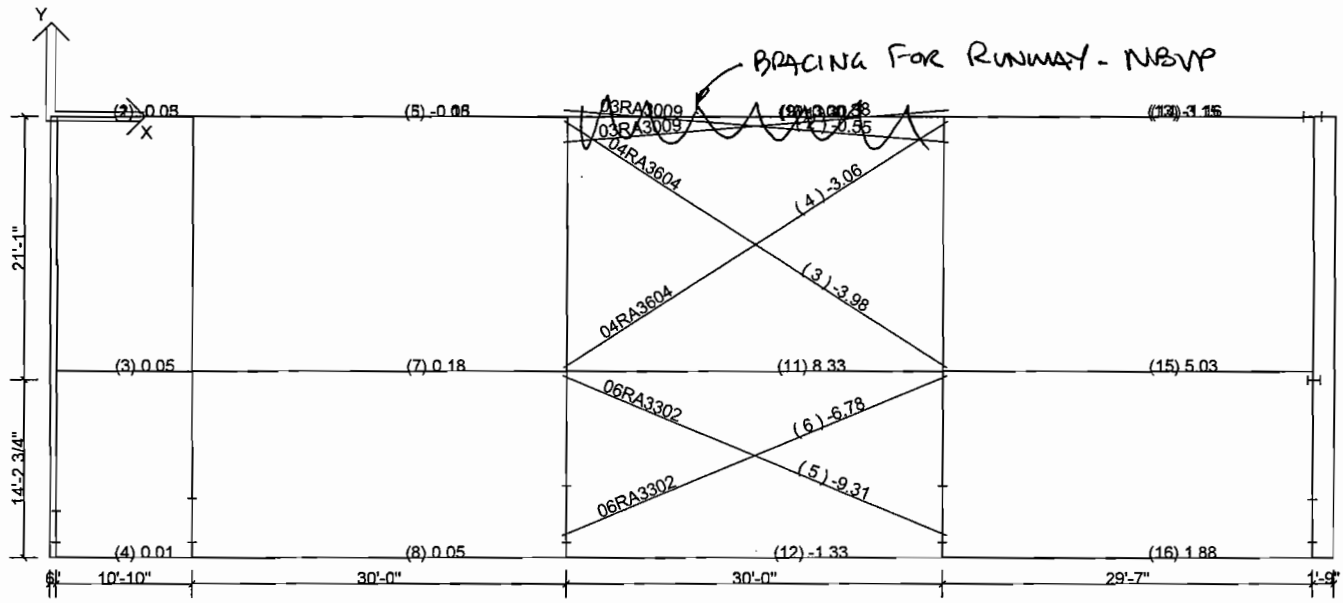
| Name1 | Name2 | Type | Bracket Shape | Start Frame | Start Adjust. | End Frame | End Adjust. | Aisle | Start Elev. | From Left Edge | From Right Edge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | | Flexible Suspension - Hangers | NBVP | 1 | 0/3/0 | 5 | 0/3/0 | 1 | 26/4/0 | 33/5/12 | 0/0/0 |

| Type | Designed & Provided | Size | Size | Rail Size (lb/yd) | Vertical Deflection | Horizontal Deflection | Vertical Impact(%) | Lateral Impact(%) | Longitudinal Impact(%) |
|---|---|---|---|---|---|---|---|---|---|
| Wide Flange - Hot Rolled | NBVP | W 16 | | 0 | - | - | 10.00 | 20.00 | 10.00 |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |




**Diagonal Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 30.73 | 2.0 | -0.38 | 1.0000 | 1.0000 | 0.156 | 1.0<W1 | passed | |
| 2 | R 0.375 | 30.73 | 2.0 | -0.55 | 1.0000 | 1.0000 | 0.224 | 1.0W2> | passed | |
| 3 | R 0.5 | 36.32 | 35.4 | -3.98 | 1.0000 | 1.0000 | 0.706 | 1.0<W2 | passed | |
| 4 | R 0.5 | 36.32 | 35.4 | -3.06 | 1.0000 | 1.0000 | 0.542 | 1.0W1> | passed | |
| 5 | R 0.75 | 33.18 | 28.0 | -9.31 | 1.0000 | 1.0000 | 0.864 | 1.0<W2 | passed | |
| 6 | R 0.75 | 33.18 | 28.0 | -6.78 | 1.0000 | 1.0000 | 0.630 | 1.0W1> | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.38k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.38k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.55k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.55k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 1/8 in., F = 3.98k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 3.98k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 3/16 in., F = 3.06k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.06k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 5 | Left | Slot w/ Backing Plate: web thk = 3/16 in., F = 9.31k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot w/ Backing Plate: web thk = 1/8 in., F = 9.31k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 6 | Left | Slot: web thk = 1/8 in., F = 6.78k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web |

| | | |
|---|---|---|
| | | punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 6.78k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |

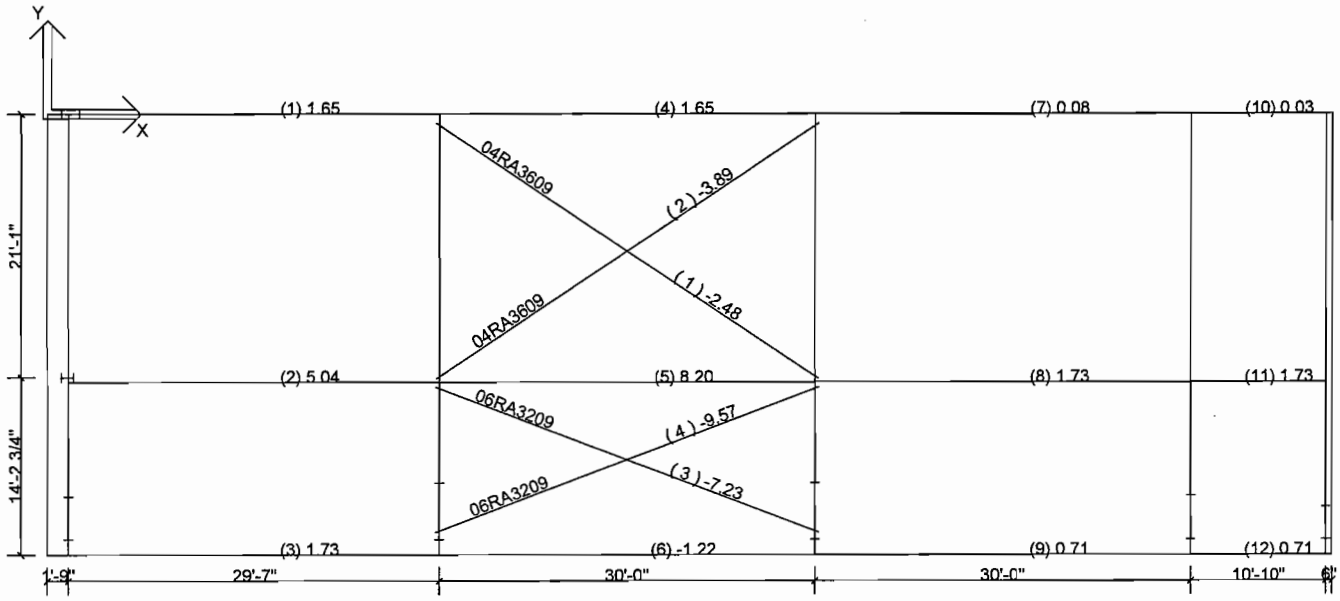
THESE NOT REQUIRED. ROOF B RIDGE PURLIN WILL SERVE AS A STRUT.

**Strut Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3P 5x0.1345x0.1345x8 | 10.83 | -0.03 | 1.0000 | 1.0000 | 0.012 | 0.700<E | passed | Ridge Strut |
| 2 | 3P 5x0.1345x0.1345x8 | 10.83 | -0.05 | 1.0000 | 1.0000 | 0.012 | 0.700<E | passed | End Bay Strut |
| 5 | 3P 8x1/4x0.1345x8 | 30.00 | -0.08 | 1.0000 | 1.0000 | 0.135 | 0.700<E | passed | Ridge Strut |
| 6 | 3P 8x1/4x0.1345x8 | 30.00 | -0.15 | 1.0000 | 1.0000 | 0.135 | 0.700<E | passed | Unbraced Bay Strut |
| 9 | 3P 8x1/4x0.1345x8 | 30.00 | -0.00 | 1.0000 | 1.0000 | 0.135 | 1.0W1> | passed | Ridge Strut |
| 10 | 3P 8x1/4x0.1345x8 | 30.00 | 3.30 | 1.0000 | 1.0000 | 0.151 | 1.0<W2 | passed | Braced Bay Strut |
| 13 | 3P 7x1/4x0.1345x8 | 29.58 | -1.16 | 1.0000 | 1.0000 | 0.159 | 1.0W1> | passed | Ridge Strut |
| 14 | 3P 7x1/4x0.1345x8 | 29.58 | 3.15 | 1.0000 | 1.0000 | 0.210 | 1.0<W2 | passed | End Bay Strut |

| Mem. | End | Strut Connection Design Information |
|---|---|---|
| 1 | Left | Frame Clip 6.00x-15.34x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 2 | Left | Frame Clip 6.00x-15.21x0.375 |
| | Right | Frame Clip 6.00x-15.21x0.375 |
| 5 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 6 | Left | Frame Clip 6.00x-15.21x0.375 |
| | Right | Frame Clip 6.00x-15.21x0.375 |
| 9 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 10 | Left | Frame Clip 6.00x-15.21x0.375 |
| | Right | Frame Clip 6.00x-15.21x0.375 |
| 13 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 14 | Left | Frame Clip 6.00x-15.21x0.375 |
| | Right | Frame Clip 6.00x-15.21x0.375 |

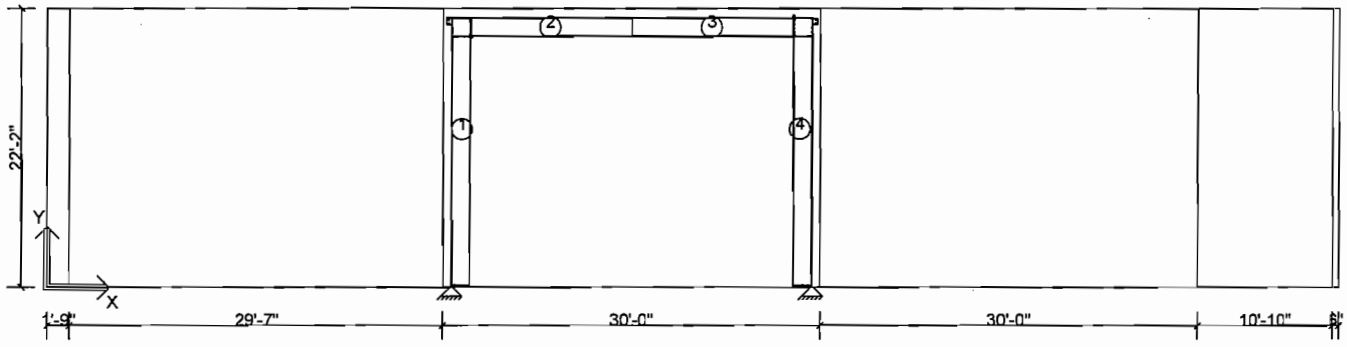
SYSTEM CANNOT "SEE" PURLIN JUST ACROSS RIDGE & GENERATES THESE IN ERROR.




**Diagonal Bracing Member Design Summary: Roof B**

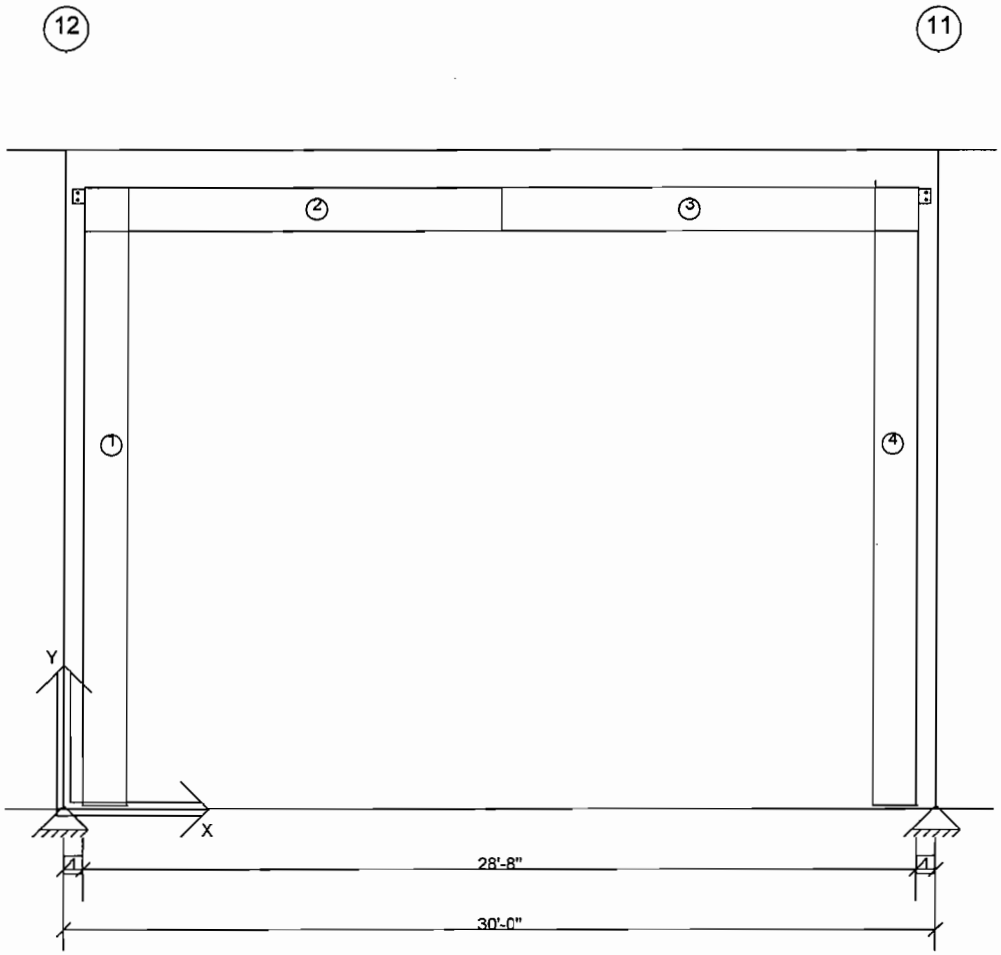
| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.5 | 36.72 | 36.9 | -2.48 | 1.0000 | 1.0000 | 0.439 | 1.0W1> | passed | |
| 2 | R 0.5 | 36.72 | 36.9 | -3.89 | 1.0000 | 1.0000 | 0.689 | 1.0<W2 | passed | |
| 3 | R 0.75 | 32.76 | 26.3 | -7.23 | 1.0000 | 1.0000 | 0.671 | 1.0W1> | passed | |
| 4 | R 0.75 | 32.76 | 26.3 | -9.57 | 1.0000 | 1.0000 | 0.888 | 1.0<W2 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 2.48k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 2.48k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 3/16 in., F = 3.89k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.89k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 3/16 in., F = 7.23k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 7.23k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot w/ Backing Plate: web thk = 1/8 in., F = 9.57k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot w/ Backing Plate: web thk = 3/16 in., F = 9.57k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |




| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | Force = 10.62k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x6x3/8 w/ (2) 3/4 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Left Main | Force = 10.62k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x13x3/8 w/ (2) 3/4 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |
| Right Portal | Force = 8.20k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x6x3/8 w/ (2) 3/4 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Right Main | Force = 8.20k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x12-3/4x3/8 w/ (2) 3/4 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |

Frame Cross Section: B




**Dimension Key**
1 8"
2 1'-3 1/2"

**Frame Clearances**
Horiz. Clearance between members 1(CX221) and 4(CX222): 25'-8"
Vert. Clearance at member 1(CX221): 19'-8 7/16"
Vert. Clearance at member 4(CX222): 19'-10 11/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. | Flg Width | Flg Thk | Web Thk | Depth1 | Depth2 | Length | Weight | Flg Fy | Web Fy | Splice | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | (in.) | (in.) | (in.) | (in.) | (in.) | (ft) | (p) | (ksi) | (ksi) | Jt.1 | Jt.2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 21.31 | 1155.0 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 10.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 14.33 | 604.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 10.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 14.33 | 604.1 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 12.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 21.31 | 1158.8 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3522.0 (p) (Includes all plates)
Frame Pricing Weight = 3611.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 30/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 30/0/0 | | | | |
| Grid1 - Grid2 | | B-12 | | B-11 | | | | |
| Base Plate W x L (in.) | | 13 x 19 | | 13 x 19 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 1.7 | -0.1 | 1.7 | - | - | - |
| AD | Frm | - | - | - | - | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | - | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | - | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | 4.2 | 6.4 | 4.0 | -6.4 | - | - | - |
| <WB1 | Brc | -3.5 | -5.6 | -3.7 | 5.6 | - | - | - |
| WB2> | Brc | 2.4 | 3.7 | 2.3 | -3.7 | - | - | - |
| <WB2 | Brc | -5.2 | -8.3 | -5.4 | 8.3 | - | - | - |
| EB> | Brc | 1.0 | 1.5 | 0.9 | -1.5 | - | - | - |
| <EB | Brc | -0.9 | -1.5 | -1.0 | 1.5 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B-12 | 5.1 | 48 | 4.3 | 35 | - | - | - | - | 7.3 | 48 | 8.1 | 35 | - | - | - | - |
| 30/0/0 | B-11 | 5.5 | 47 | 3.9 | 36 | - | - | - | - | 5.4 | 36 | 10.0 | 47 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 3.5 | 3.4 |

| | | | | |
|---|---|---|---|---|
| AD | 0.0 | 0.0 | 0.0 | 0.0 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 8.2 | 8.2 | 0.0 | 0.0 |
| <WB1 | 7.2 | 7.2 | 0.0 | 0.0 |
| WB2> | 4.8 | 4.8 | 0.0 | 0.0 |
| <WB2 | 10.6 | 10.6 | 0.0 | 0.0 |
| EB> | 1.9 | 1.9 | 0.0 | 0.0 |
| <EB | 1.9 | 1.9 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B-12 | 1 | 0.375 | 13 | 19 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 30/0/0 | B-11 | 4 | 0.375 | 13 | 19 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 19.77 | 17.000 | N/A | N/A | N/A | 0.5000 | 5.500 | Both | F-FP,W-OS-0.1875 |
| 1 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |
| 4 | 1 | S3 | 19.77 | 17.000 | N/A | N/A | N/A | 0.5000 | 5.500 | Both | F-FP,W-OS-0.1875 |
| 4 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 12.00 | 21.25 | 0.750 | A325X/ST | 3.00/7.00 | 52 | Flush | 2.00 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 10.00 | 21.25 | 0.750 | A325X/ST | 3.00/7.00 | 52 | Flush | 2.00 | 31 | Extended | 3.50 |
| 3 | 2 | KN(Face) | 0.500 | 10.00 | 21.25 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 52 | Flush | 2.00 |
| 4 | 2 | KN(Face) | 0.500 | 12.00 | 21.25 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 52 | Flush | 2.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 35 | -4.2 | 7.0 | 1002.4 | Thin plate | 212.1 | 941.3 | 48 | -5.4 | 8.0 | 1293.2 | Thick plate | 159.0 | 1391.6 |
| 2 | 1 | 35 | -4.2 | 7.0 | 1002.4 | Thin plate | 212.1 | 941.3 | 48 | -5.4 | 8.0 | 1293.2 | Thick plate | 159.0 | 1391.6 |
| 3 | 2 | 47 | -5.4 | 9.0 | 1293.9 | Thick plate | 159.0 | 1391.6 | 36 | -4.2 | 6.1 | 995.3 | Thin plate | 212.1 | 941.3 |
| 4 | 2 | 47 | -5.4 | 9.0 | 1293.9 | Thick plate | 159.0 | 1391.6 | 36 | -4.2 | 6.1 | 995.3 | Thin plate | 212.1 | 941.3 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |

| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.81 | 18.00 | 48 | 48 | 7.4 | 5.1 | 1222.2 | 0.0 | 487.8 | 32.4 | 3353.5 | 937.1 | 0.37 | 0.16 |
| 2 | 0.75 | 18.00 | 48 | 47 | -5.4 | -8.4 | 1293.2 | 0.0 | 337.9 | 32.4 | 3131.7 | 760.6 | 0.42 | 0.26 |
| 3 | 12.83 | 18.00 | 47 | 47 | -5.4 | -9.0 | -1293.9 | 0.0 | 337.9 | 32.4 | 3131.7 | 760.6 | 0.42 | 0.28 |
| 4 | 19.81 | 18.00 | 47 | 47 | -10.0 | 5.6 | -1325.1 | 0.0 | 378.8 | 32.4 | 3353.5 | 937.1 | 0.41 | 0.17 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.81 | 237.67 | 237.7 | 237.7 | 15.19 | 15.19 | 995.77 | 144.01 | 110.64 | 24.00 | 118.55 | 36.15 | 1.04 | 11025.71 | 1.67 | 1.00 | 1.06 | 0.89 | 1.00 |
| 2 | 0.75 | 308.00 | 18.0 | 18.0 | 13.19 | 13.19 | 842.60 | 83.34 | 93.62 | 16.67 | 101.05 | 25.15 | 0.87 | 6380.92 | 1.00 | 1.00 | 1.07 | 0.98 | 0.88 |
| 3 | 12.83 | 308.00 | 308.0 | 308.0 | 13.19 | 13.19 | 842.60 | 83.34 | 93.62 | 16.67 | 101.05 | 25.15 | 0.87 | 6380.92 | 2.22 | 1.00 | 1.07 | 0.98 | 0.88 |
| 4 | 19.81 | 237.67 | 237.7 | 237.7 | 15.19 | 15.19 | 995.77 | 144.01 | 110.64 | 24.00 | 118.55 | 36.15 | 1.04 | 11025.71 | 1.66 | 1.00 | 1.06 | 0.89 | 0.90 |

**Deflection Load Combinations - Framing**

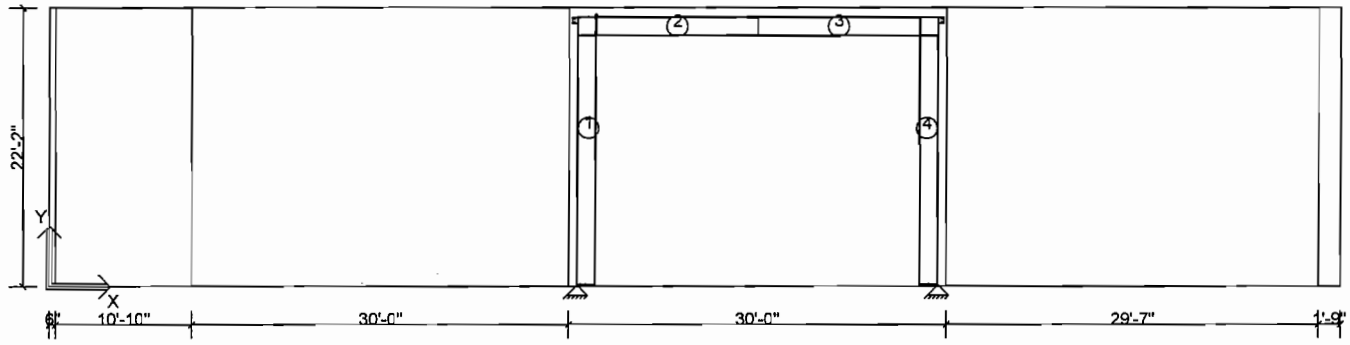
| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: B**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/210 ) | 1.172 | 1 | 2 | 22 | <WB2 |
| Max. Vertical Deflection for Span 1 | ( L/55985 ) | -0.006 | 3 | 1 | 13 | <WB2 |

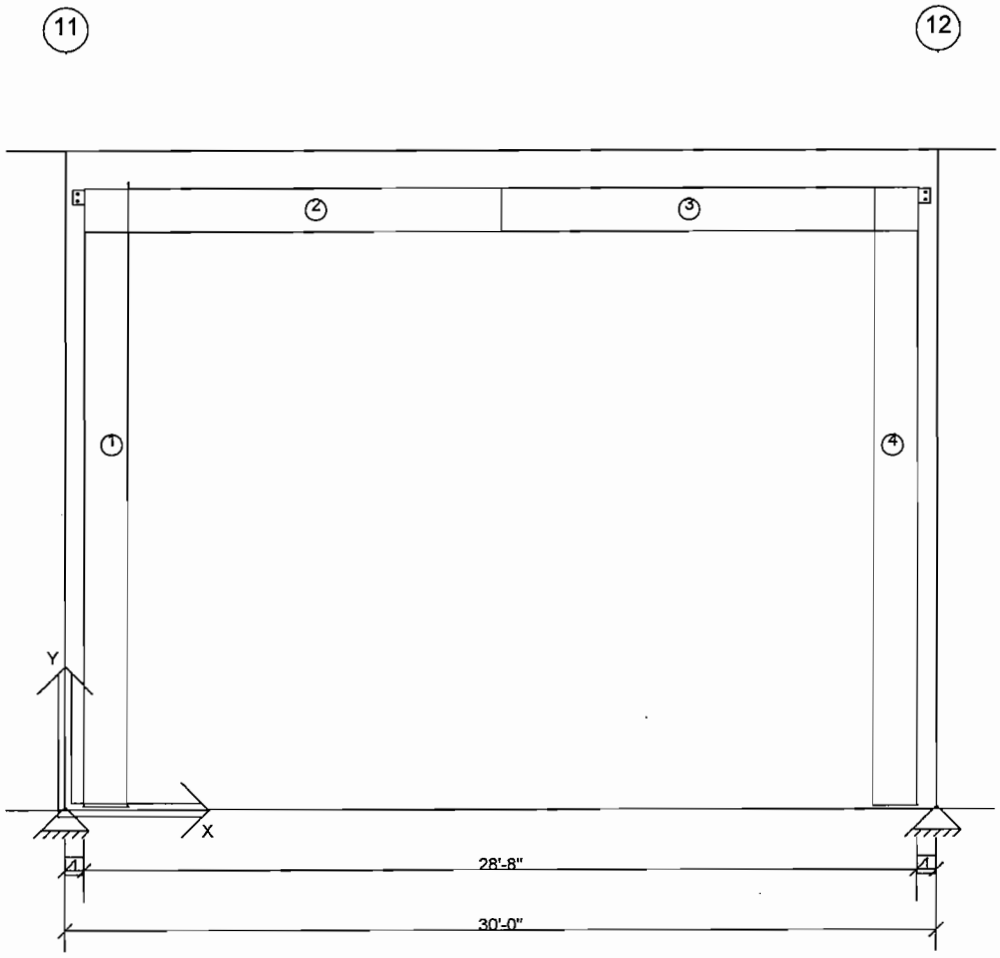
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.




| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | Force = 7.40k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x6x3/8 w/ (2) 3/4 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Left Main | Force = 7.40k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x13x3/8 w/ (2) 3/4 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |
| Right Portal | Force = 10.21k, Seismic Factor = 1.00, Stress Increase = 1.00, MZE 5x6x3/8 w/ (2) 3/4 A325SC, Flange weld = 3/16 fillet both sides, buckling OK, web yielding/crippling OK => passed |
| Right Main | Force = 10.21k, Seismic Factor = 1.00, Stress Increase = 1.00, Haunch Connection, MZE 7x12-3/4x3/8 w/ (2) 3/4 A325SC, Flange weld 3/16 fillet both sides, Web weld 3/16 fillet one side, buckling OK => passed |

Frame Cross Section: J




**Dimension Key**
1 8"
2 1'-3 1/2"

**Frame Clearances**
Horiz. Clearance between members 1(CX222) and 4(CX221): 25'-8"
Vert. Clearance at member 1(CX222): 19'-10 11/16"
Vert. Clearance at member 4(CX221): 19'-8 7/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. | Flg Width | Flg Thk | Web Thk | Depth1 | Depth2 | Length | Weight | Flg Fy | Web Fy | Splice | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | (in.) | (in.) | (in.) | (in.) | (in.) | (ft) | (p) | (ksi) | (ksi) | Jt.1 | Jt.2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 21.31 | 1158.8 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 10.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 14.33 | 604.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 10.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 14.33 | 604.1 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 12.00 | 0.5000 | 0.1875 | 18.00 | 18.00 | 21.31 | 1155.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3522.0 (p) (Includes all plates)
Frame Pricing Weight = 3611.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 30/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: J**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 30/0/0 | | | | |
| Grid1 - Grid2 | | J-11 | | J-12 | | | | |
| Base Plate W x L (in.) | | 13 x 19 | | 13 x 19 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 1.7 | -0.1 | 1.7 | - | - | - |
| AD | Frm | - | - | - | - | - | - | - |
| CG | Frm | - | - | - | - | - | - | - |
| L> | Frm | - | - | - | - | - | - | - |
| <L | Frm | - | - | - | - | - | - | - |
| S> | Frm | - | - | - | - | - | - | - |
| <S | Frm | - | - | - | - | - | - | - |
| US1* | Frm | - | - | - | - | - | - | - |
| *US1 | Frm | - | - | - | - | - | - | - |
| W1> | Frm | - | - | - | - | - | - | - |
| <W1 | Frm | - | - | - | - | - | - | - |
| W2> | Frm | - | - | - | - | - | - | - |
| <W2 | Frm | - | - | - | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | - | - | - | - | - |
| S | Frm | - | - | - | - | - | - | - |
| E> | Frm | - | - | - | - | - | - | - |
| EG+ | Frm | - | - | - | - | - | - | - |
| <E | Frm | - | - | - | - | - | - | - |
| EG- | Frm | - | - | - | - | - | - | - |
| WP | Frm | - | - | - | - | - | - | - |
| WB1> | Brc | -3.6 | -5.8 | -3.8 | 5.8 | - | - | - |
| <WB1 | Brc | 3.2 | 4.9 | 3.0 | -4.9 | - | - | - |
| WB2> | Brc | -1.7 | -2.7 | -1.7 | 2.7 | - | - | - |
| <WB2 | Brc | 5.2 | 8.0 | 5.0 | -8.0 | - | - | - |
| EB> | Brc | -0.9 | -1.5 | -1.0 | 1.5 | - | - | - |
| <EB | Brc | 1.0 | 1.5 | 0.9 | -1.5 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | J-11 | 3.5 | 36 | 5.3 | 47 | - | - | - | - | 4.8 | 36 | 9.7 | 47 | - | - | - | - |
| 30/0/0 | J-12 | 3.9 | 35 | 4.9 | 48 | - | - | - | - | 7.0 | 48 | 7.5 | 35 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 3.5 | 3.4 |

| | | | | |
|---|---|---|---|---|
| AD | 0.0 | 0.0 | 0.0 | 0.0 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 7.4 | 7.4 | 0.0 | 0.0 |
| <WB1 | 6.2 | 6.2 | 0.0 | 0.0 |
| WB2> | 3.4 | 3.4 | 0.0 | 0.0 |
| <WB2 | 10.2 | 10.2 | 0.0 | 0.0 |
| EB> | 1.9 | 1.9 | 0.0 | 0.0 |
| <EB | 1.9 | 1.9 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | J-11 | 1 | 0.375 | 13 | 19 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 30/0/0 | J-12 | 4 | 0.375 | 13 | 19 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 19.77 | 17.000 | N/A | N/A | N/A | 0.5000 | 5.500 | Both | F-FP,W-OS-0.1875 |
| 1 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |
| 4 | 1 | S3 | 19.77 | 17.000 | N/A | N/A | N/A | 0.5000 | 5.500 | Both | F-FP,W-OS-0.1875 |
| 4 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 12.00 | 21.25 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 52 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.500 | 10.00 | 21.25 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 52 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.500 | 10.00 | 21.25 | 0.750 | A325X/ST | 3.00/7.00 | 52 | Flush | 2.00 | 31 | Extended | 3.50 |
| 4 | 2 | KN(Face) | 0.500 | 12.00 | 21.25 | 0.750 | A325X/ST | 3.00/7.00 | 52 | Flush | 2.00 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 47 | -5.2 | 8.6 | 1244.6 | Thick plate | 159.0 | 1391.6 | 36 | -3.8 | 5.5 | 896.9 | Thin plate | 212.1 | 941.3 |
| 2 | 1 | 47 | -5.2 | 8.6 | 1244.6 | Thick plate | 159.0 | 1391.6 | 36 | -3.8 | 5.5 | 896.9 | Thin plate | 212.1 | 941.3 |
| 3 | 2 | 35 | -3.8 | 6.4 | 906.1 | Thin plate | 212.1 | 941.3 | 48 | -5.2 | 7.7 | 1242.9 | Thick plate | 159.0 | 1391.6 |
| 4 | 2 | 35 | -3.8 | 6.4 | 906.1 | Thin plate | 212.1 | 941.3 | 48 | -5.2 | 7.7 | 1242.9 | Thick plate | 159.0 | 1391.6 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. | Loc. | Depth | Controlling Cases Axial + | Controlling Cases Shear | Required Strength Axial Pr | Required Strength Shear Vr | Required Strength Mom-x Mrx | Required Strength Mom-y Mry | Available Strength Axial Pc | Available Strength Shear Vc | Available Strength Mom-x Mcx | Available Strength Mom-y Mcy | Strength Ratios Axial + | Strength Ratios Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.81 | 18.00 | 47 | 47 | -9.7 | -5.4 | -1274.8 | 0.0 | 378.8 | 32.4 | 3353.5 | 937.1 | 0.39 | 0.17 |
| 2 | 0.75 | 18.00 | 47 | 47 | -5.2 | 8.6 | -1244.6 | 0.0 | 337.9 | 32.4 | 3131.7 | 760.6 | 0.41 | 0.27 |
| 3 | 12.83 | 18.00 | 48 | 47 | -5.2 | 8.1 | 1242.9 | 0.0 | 337.9 | 32.4 | 3131.7 | 760.6 | 0.40 | 0.25 |
| 4 | 19.81 | 18.00 | 48 | 48 | 7.1 | -4.9 | 1174.5 | 0.0 | 487.8 | 32.4 | 3353.5 | 937.1 | 0.36 | 0.15 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.81 | 237.67 | 237.7 | 237.7 | 15.19 | 15.19 | 995.77 | 144.01 | 110.64 | 24.00 | 118.55 | 36.15 | 1.04 | 11025.71 | 1.66 | 1.00 | 1.06 | 0.89 | 0.90 |
| 2 | 0.75 | 308.00 | 18.0 | 18.0 | 13.19 | 13.19 | 842.60 | 83.34 | 93.62 | 16.67 | 101.05 | 25.15 | 0.87 | 6380.92 | 1.00 | 1.00 | 1.07 | 0.98 | 0.88 |
| 3 | 12.83 | 308.00 | 308.0 | 308.0 | 13.19 | 13.19 | 842.60 | 83.34 | 93.62 | 16.67 | 101.05 | 25.15 | 0.87 | 6380.92 | 2.23 | 1.00 | 1.07 | 0.98 | 0.88 |
| 4 | 19.81 | 237.67 | 237.7 | 237.7 | 15.19 | 15.19 | 995.77 | 144.01 | 110.64 | 24.00 | 118.55 | 36.15 | 1.04 | 11025.71 | 1.67 | 1.00 | 1.06 | 0.89 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: J**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/218 ) | -1.127 | 4 | 2 | 22 | <WB2 |
| Max. Vertical Deflection for Span 1 | ( L/58318 ) | -0.006 | 3 | 1 | 13 | <WB2 |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Shape: Clerestory Frames

**Loads and Codes - Shape: Clerestory Frames**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.575)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 4/9/8
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 21.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.0981
Bracing Seismic Period: 0.0648
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

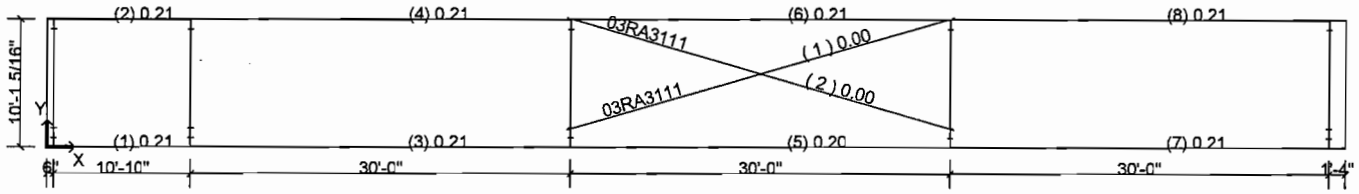
**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Underhung Crane
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

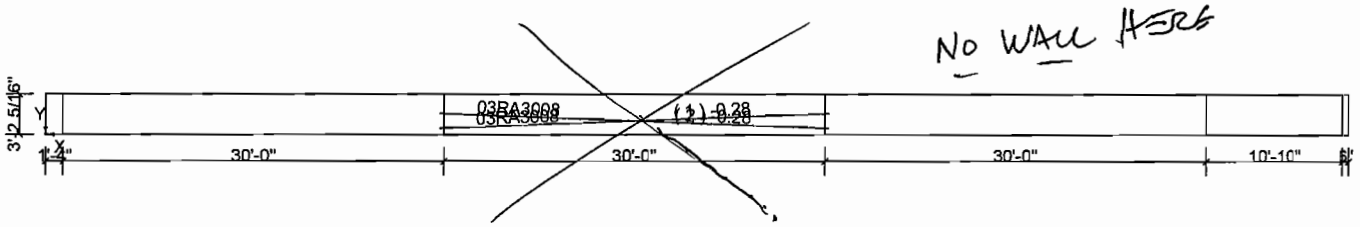
CLERESTORY ROOF AREA




**Diagonal Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 31.85 | 16.9 | 0.00 | 1.0000 | 1.0000 | 0.002 | 1.0W2> | passed | |
| 2 | R 0.375 | 31.85 | 16.9 | 0.00 | 1.0000 | 1.0000 | 0.002 | 1.0<W2 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |

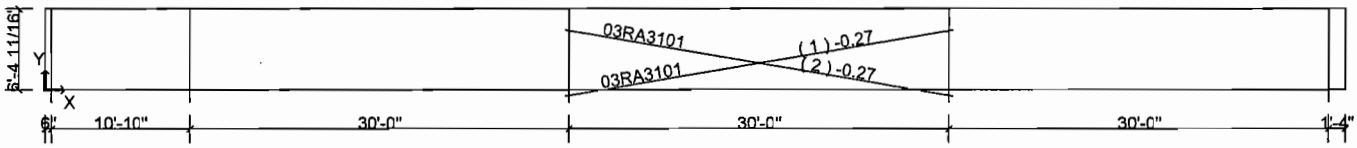



**Diagonal Bracing Member Design Summary: Sidewall 2**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 30.65 | 6.1 | -0.28 | 1.0000 | 1.0000 | 0.114 | 1.0<W1 | passed | |
| 2 | R 0.375 | 30.65 | 6.1 | -0.28 | 1.0000 | 1.0000 | 0.114 | 1.0W2> | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.28k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.28k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.28k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.28k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |

CLERESTORY WALL




**Diagonal Bracing Member Design Summary: Sidewall 4**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 31.06 | 13.9 | -0.27 | 1.0000 | 1.0000 | 0.111 | 1.0W2> | passed | |
| 2 | R 0.375 | 31.06 | 13.9 | -0.27 | 1.0000 | 1.0000 | 0.111 | 1.0<W1 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.27k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.27k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.27k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.27k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |

## Secondary - Summary Report

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 6) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 6) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 23 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 24 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 25 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 27 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |

| | | | | |
|---|---|---|---|---|
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |
| 4 | System | 1.000 | 0.700 E> | E> |
| 5 | System | 1.000 | 0.700 <E | <E |

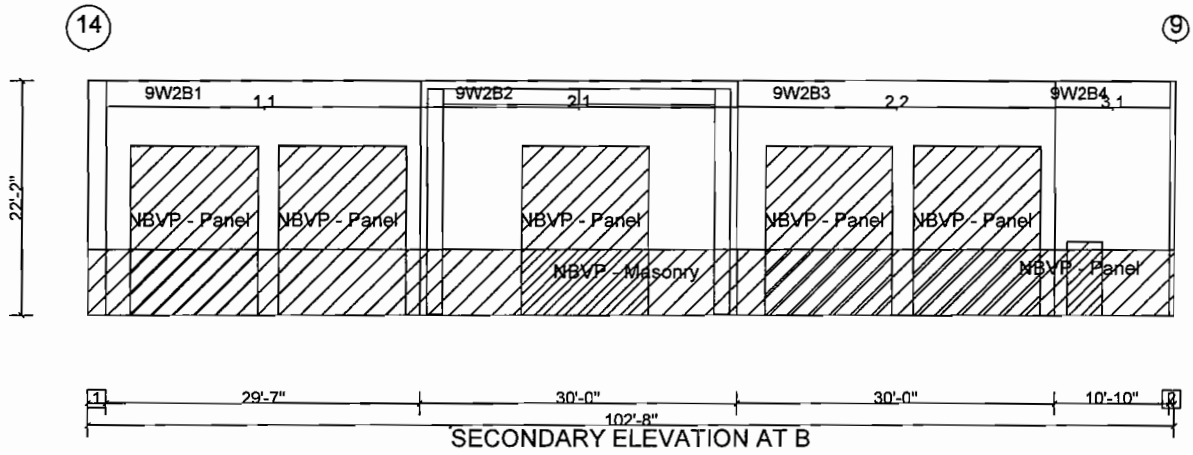
**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 0.500 <E | <E |

**Wall: 2**




**Dimension Key**
1 1'-9"
2 6"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.3125 | 0.1345 | 17.00 | 17.00 | 14.33 | 348.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.3125 | 0.1345 | 17.00 | 17.00 | 14.74 | 358.7 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 707.0 (p) (Includes all plates)
Frame Pricing Weight = 707.0 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | ST | 0.375 | 10.00 | 4.50 | 55 | 0.750 | A325X/ST | 3 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FI | 4.25 | 0.31 |
| 1,1 | 2 | ST | 0.375 | 10.00 | 4.50 | 55 | 0.750 | A325X/ST | 3 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.69 | 3.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | 1 | 0.00 | -4.86 | 0.00 | 4.86 | 0.0 | 1.99 | 0.18 | 0.23 | 0.12 | 0.40 | OK->ClipLocalBuckling | 0.0310 | 0.1875 |
| 1,1 | 2 | 1 | 0.00 | -4.82 | 0.00 | 4.82 | 0.0 | 1.99 | 0.18 | 0.23 | 0.15 | 0.47 | OK->ColumnWebRupture | 0.0307 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 29/7/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 14.79 | 17.00 | 1 | 1 | 0.0 | -4.9 | -427.8 | 0.0 | 237.7 | 12.2 | 417.2 | 228.2 | 1.03 | 0.40 |
| 25001 | 0.00 | 17.00 | 1 | 1 | 0.0 | 4.8 | -427.8 | 0.0 | 237.7 | 12.2 | 417.2 | 228.2 | 1.03 | 0.40 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 14.79 | 355.00 | 355.0 | 355.0 | 7.20 | 7.20 | 397.35 | 26.67 | 46.75 | 6.67 | 50.73 | 10.07 | 0.18 | 1856.72 | 1.14 | 1.00 | 1.02 | 0.81 | 1.00 |
| 25001 | 0.00 | 355.00 | 355.0 | 355.0 | 7.20 | 7.20 | 397.35 | 26.67 | 46.75 | 6.67 | 50.73 | 10.07 | 0.18 | 1856.72 | 1.14 | 1.00 | 1.02 | 0.81 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1039 ) | 0.341 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

MAY NEED TO BE MADE DEEPER TO FIT AROUND PORTAL FRAME BEAM

**Spandrel(Id=2,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 758.4 (p) (Includes all plates)
Frame Pricing Weight = 758.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.66 | 3.00 |
| 2,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.69 | 3.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,1 | 1 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |
| 2,1 | 2 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/550 ) | 0.653 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 758.4 (p) (Includes all plates)
Frame Pricing Weight = 758.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.66 | 3.00 |
| 2,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.69 | 3.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,2 | 1 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |
| 2,2 | 2 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/550 ) | 0.653 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=3,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 5.37 | 45.4 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 5.37 | 45.3 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 90.7 (p) (Includes all plates)
Frame Pricing Weight = 90.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 3,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.66 | 3.00 |
| 3,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.69 | 2.75 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 3,1 | 1 | 1 | 0.00 | -1.96 | 0.00 | 1.96 | 0.0 | 1.03 | 0.14 | 0.18 | 0.16 | 0.47 | OK->ColumnWebRupture | 0.0241 | 0.0884 |
| 3,1 | 2 | 1 | 0.00 | -2.05 | 0.00 | 2.05 | 0.0 | 1.03 | 0.15 | 0.19 | 0.16 | 0.54 | OK->ColumnWebRupture | 0.0253 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 10/10/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 5.42 | 9.00 | 1 | 1 | 0.0 | -2.0 | -65.6 | 0.0 | 83.1 | 20.9 | 156.3 | 39.0 | 0.42 | 0.09 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 2.1 | -65.6 | 0.0 | 83.1 | 20.9 | 156.3 | 39.0 | 0.42 | 0.10 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.42 | 130.00 | 130.0 | 130.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |
| 25001 | 0.00 | 130.00 | 130.0 | 130.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

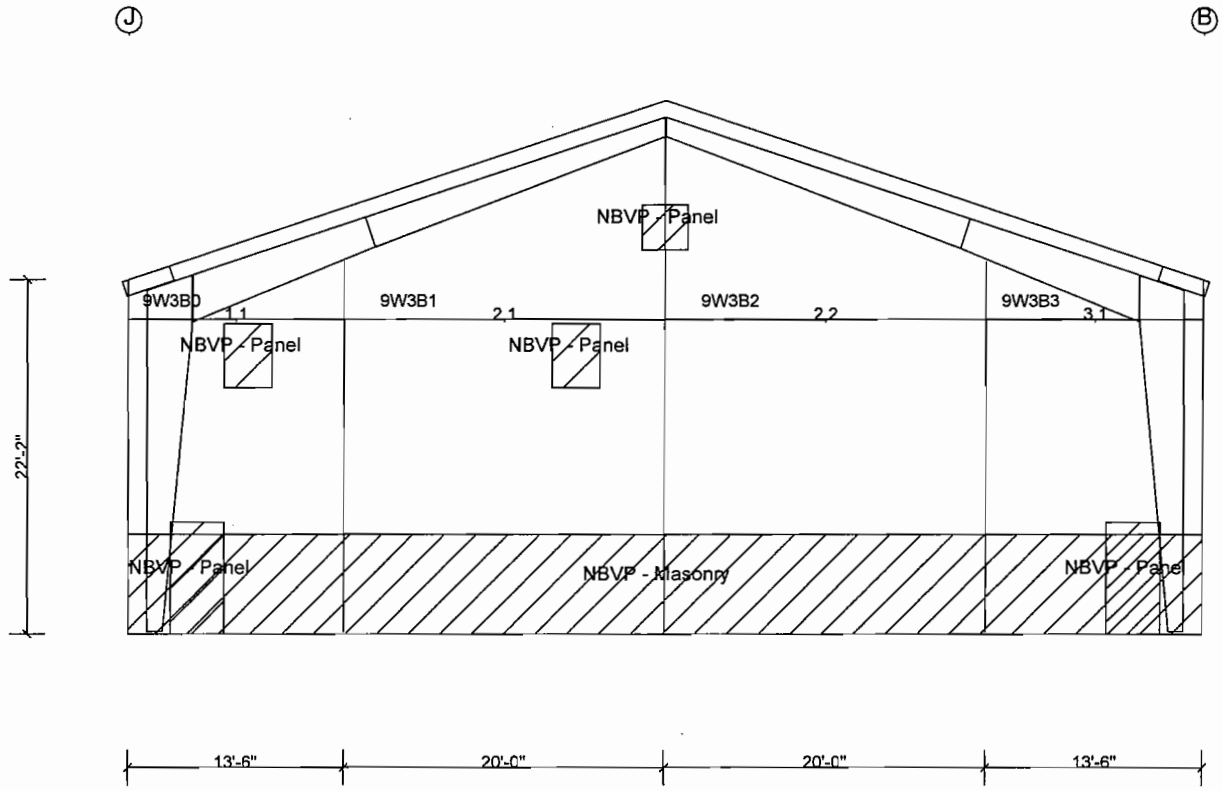
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=3,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1583 ) | 0.082 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 3**


J
B
NBVP - Panel
9W3B0
1.1
9W3B1
2.1
9W3B2
2.2
9W3B3
3.1
NBVP - Panel
NBVP - Panel
22'-2"
NBVP - Panel
NBVP - Masonry
NBVP - Panel
13'-6"
20'-0"
20'-0"
13'-6"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 11.00 | 11.00 | 6.75 | 63.9 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1345 | 0.1345 | 11.00 | 11.00 | 6.70 | 62.8 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 126.7 (p) (Includes all plates)
Frame Pricing Weight = 126.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.19 | 2.81 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | SIM TO JOINT 2 | 0.0000 | 0.0000 |
| 1,1 | 2 | 1 | 0.00 | -3.04 | 0.00 | 3.04 | 0.0 | 1.03 | 0.22 | 0.28 | 0.17 | 0.66 | OK->ColumnWebRupture | 0.0375 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 13/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 6.75 | 11.00 | 1 | 1 | 0.0 | -2.8 | -118.1 | 0.0 | 92.0 | 18.3 | 124.6 | 39.0 | 0.95 | 0.15 |
| 25001 | 0.00 | 11.00 | 1 | 1 | 0.0 | 3.0 | -118.1 | 0.0 | 92.0 | 18.3 | 124.6 | 39.0 | 0.95 | 0.17 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 6.75 | 162.00 | 162.0 | 162.0 | 2.79 | 2.79 | 53.55 | 2.80 | 9.74 | 1.12 | 11.18 | 1.73 | 0.02 | 82.77 | 1.14 | 1.00 | 1.15 | 0.62 | 1.00 |
| 25001 | 0.00 | 162.00 | 162.0 | 162.0 | 2.79 | 2.79 | 53.55 | 2.80 | 9.74 | 1.12 | 11.18 | 1.73 | 0.02 | 82.77 | 1.14 | 1.00 | 1.15 | 0.62 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1112 ) | 0.146 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 9.95 | 171.8 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 9.95 | 171.5 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 343.3 (p) (Includes all plates)
Frame Pricing Weight = 343.3 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.18 | 2.81 |
| 2,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.69 | 2.88 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 2,1 | 1 | 1 | 0.00 | -5.63 | 0.00 | 5.63 | 0.0 | 1.03 | 0.41 | 0.52 | 0.45 | 0.66 | OK->ColumnWebRupture | 0.1044 | 0.0884 |
| 2,1 | 2 | 1 | 0.00 | -6.52 | 0.00 | 6.52 | 0.0 | 1.03 | 0.48 | 0.60 | 0.53 | 0.85 | OK->CopedBeamFlexure | 0.1237 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 20/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 10.00 | 9.00 | 1 | 1 | 0.0 | -5.6 | -364.3 | 0.0 | 169.7 | 21.4 | 387.0 | 159.5 | 0.94 | 0.26 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 6.5 | -364.3 | 0.0 | 169.7 | 21.4 | 387.0 | 159.5 | 0.94 | 0.30 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 10.00 | 240.00 | 240.0 | 240.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 240.00 | 240.0 | 240.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/379 ) | 0.633 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 9.95 | 171.5 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.2500 | 0.1345 | 9.00 | 9.00 | 9.95 | 171.8 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 343.4 (p) (Includes all plates)
Frame Pricing Weight = 343.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.67 | 2.88 |
| 2,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.19 | 2.81 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,2 | 1 | 1 | 0.00 | -6.52 | 0.00 | 6.52 | 0.0 | 1.03 | 0.48 | 0.60 | 0.53 | 0.84 | OK->CopedBeamFlexure | 0.1233 | 0.0884 |
| 2,2 | 2 | 1 | 0.00 | -5.63 | 0.00 | 5.63 | 0.0 | 1.03 | 0.41 | 0.52 | 0.45 | 0.66 | OK->ColumnWebRupture | 0.1045 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 20/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 10.00 | 9.00 | 1 | 1 | 0.0 | -6.5 | -364.3 | 0.0 | 169.7 | 21.4 | 387.0 | 159.5 | 0.94 | 0.30 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 5.6 | -364.3 | 0.0 | 169.7 | 21.4 | 387.0 | 159.5 | 0.94 | 0.26 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 10.00 | 240.00 | 240.0 | 240.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |
| 25001 | 0.00 | 240.00 | 240.0 | 240.0 | 5.14 | 5.14 | 83.47 | 21.34 | 18.55 | 5.33 | 19.93 | 8.04 | 0.09 | 408.37 | 1.14 | 1.00 | 1.07 | 0.78 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/379 ) | 0.633 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=3,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 10.00 | 10.00 | 6.70 | 59.7 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1345 | 0.1345 | 10.00 | 10.00 | 6.75 | 60.8 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 120.5 (p) (Includes all plates)
Frame Pricing Weight = 120.5 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 3,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 4.18 | 2.81 |
| 3,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 3,1 | 1 | 1 | 0.00 | -2.87 | 0.00 | 2.87 | 0.0 | 1.03 | 0.21 | 0.26 | 0.19 | 0.66 | OK->ColumnWebRupture | 0.0354 | 0.0884 |
| 3,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | SYM TO JOINT 1 | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 13/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 6.75 | 10.00 | 1 | 1 | 0.0 | -2.9 | -111.1 | 0.0 | 87.6 | 20.3 | 114.3 | 39.0 | 0.97 | 0.14 |
| 25001 | 0.00 | 10.00 | 1 | 1 | 0.0 | 2.7 | -111.1 | 0.0 | 87.6 | 20.3 | 114.3 | 39.0 | 0.97 | 0.13 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 6.75 | 162.00 | 162.0 | 162.0 | 2.65 | 2.65 | 43.06 | 2.80 | 8.61 | 1.12 | 9.82 | 1.73 | 0.02 | 68.23 | 1.13 | 1.00 | 1.14 | 0.65 | 1.00 |
| 25001 | 0.00 | 162.00 | 162.0 | 162.0 | 2.65 | 2.65 | 43.06 | 2.80 | 8.61 | 1.12 | 9.82 | 1.73 | 0.02 | 68.23 | 1.13 | 1.00 | 1.14 | 0.65 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

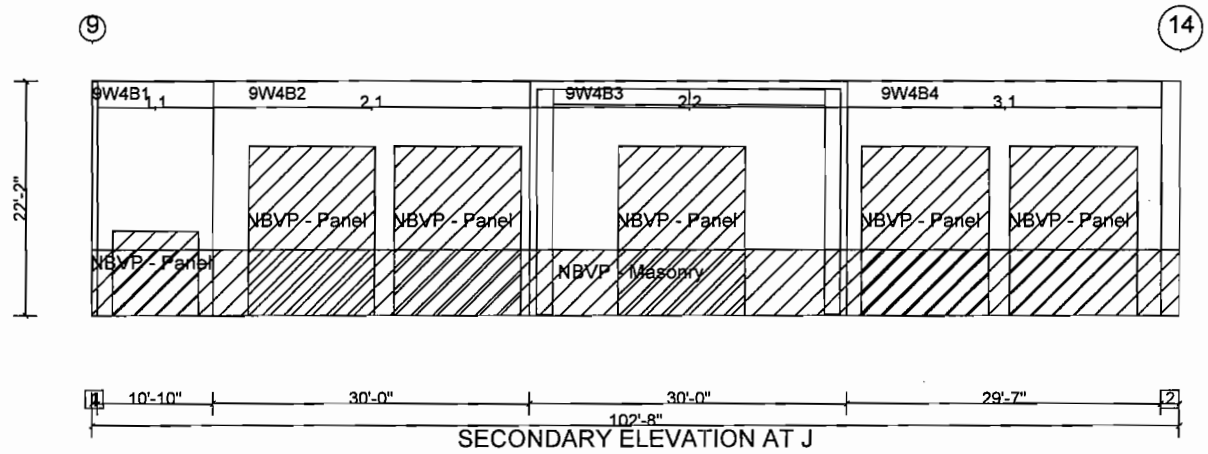
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=3,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/947 ) | 0.171 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4**




SECONDARY ELEVATION AT J

**Dimension Key**
1 6"
2 1'-9"

**Spandrel(Id=1,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 5.37 | 45.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 5.36 | 45.3 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 90.7 (p) (Includes all plates)
Frame Pricing Weight = 90.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 1,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.67 | 2.75 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.69 | 3.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 1,1 | 1 | 1 | 0.00 | -2.05 | 0.00 | 2.05 | 0.0 | 1.03 | 0.15 | 0.19 | 0.16 | 0.54 | OK->ColumnWebRupture | 0.0253 | 0.0884 |
| 1,1 | 2 | 1 | 0.00 | -1.96 | 0.00 | 1.96 | 0.0 | 1.03 | 0.14 | 0.18 | 0.16 | 0.47 | OK->ColumnWebRupture | 0.0241 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 10/10/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 5.42 | 9.00 | 1 | 1 | 0.0 | -2.1 | -65.6 | 0.0 | 83.1 | 20.9 | 156.3 | 39.0 | 0.42 | 0.10 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 2.0 | -65.6 | 0.0 | 83.1 | 20.9 | 156.3 | 39.0 | 0.42 | 0.09 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 5.42 | 130.00 | 130.0 | 130.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |
| 25001 | 0.00 | 130.00 | 130.0 | 130.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.14 | 1.00 | 1.13 | 0.67 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=1,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1583 ) | 0.082 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 758.3 (p) (Includes all plates)
Frame Pricing Weight = 758.3 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 2,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.66 | 3.00 |
| 2,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.63 | 3.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Load Case | Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Beam Web in. | Column in. |
| 2,1 | 1 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |
| 2,1 | 2 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/550 ) | 0.653 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=2,2)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.3 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.3750 | 0.1345 | 12.00 | 12.00 | 14.95 | 379.1 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 758.3 (p) (Includes all plates)
Frame Pricing Weight = 758.3 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,2 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.66 | 3.00 |
| 2,2 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.63 | 3.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,2 | 1 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |
| 2,2 | 2 | 1 | 0.00 | -4.87 | 0.00 | 4.87 | 0.0 | 1.03 | 0.36 | 0.45 | 0.24 | 0.47 | OK->ColumnWebRupture | 0.0601 | 0.0884 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 4.9 | -438.7 | 0.0 | 247.9 | 18.2 | 430.2 | 349.2 | 1.02 | 0.27 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 7.51 | 7.51 | 218.74 | 32.00 | 36.46 | 8.00 | 39.13 | 12.05 | 0.29 | 1081.20 | 1.14 | 1.00 | 1.07 | 0.96 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=2,2)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/550 ) | 0.653 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel(Id=3,1)**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.00 | 0.3125 | 0.1345 | 17.00 | 17.00 | 14.74 | 358.9 | 55.00 | 55.00 | SS | SS | 3P |
| 25001 | 8.00 | 0.3125 | 0.1345 | 17.00 | 17.00 | 14.33 | 348.3 | 55.00 | 55.00 | SS | SS | 3P |

Total Frame Weight = 707.2 (p) (Includes all plates)
Frame Pricing Weight = 707.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 3,1 | 1 | ST | 0.375 | 10.00 | 4.50 | 55 | 0.750 | A325X/ST | 3 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FO | 3.66 | 3.00 |
| 3,1 | 2 | ST | 0.375 | 10.00 | 4.50 | 55 | 0.750 | A325X/ST | 3 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | FI | 4.25 | 0.31 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 3,1 | 1 | 1 | 0.00 | -4.82 | 0.00 | 4.82 | 0.0 | 1.99 | 0.18 | 0.23 | 0.15 | 0.47 | OK->ColumnWebRupture | 0.0307 | 0.0884 |
| 3,1 | 2 | 1 | 0.00 | -4.86 | 0.00 | 4.86 | 0.0 | 1.99 | 0.18 | 0.23 | 0.12 | 0.40 | OK->ClipLocalBuckling | 0.0310 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 29/7/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 14.79 | 17.00 | 1 | 1 | 0.0 | -4.8 | -427.8 | 0.0 | 237.7 | 12.2 | 417.2 | 228.2 | 1.03 | 0.40 |
| 25001 | 0.00 | 17.00 | 1 | 1 | 0.0 | 4.9 | -427.8 | 0.0 | 237.7 | 12.2 | 417.2 | 228.2 | 1.03 | 0.40 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 14.79 | 355.00 | 355.0 | 355.0 | 7.20 | 7.20 | 397.35 | 26.67 | 46.75 | 6.67 | 50.73 | 10.07 | 0.18 | 1856.72 | 1.14 | 1.00 | 1.02 | 0.81 | 1.00 |
| 25001 | 0.00 | 355.00 | 355.0 | 355.0 | 7.20 | 7.20 | 397.35 | 26.67 | 46.75 | 6.67 | 50.73 | 10.07 | 0.18 | 1856.72 | 1.14 | 1.00 | 1.02 | 0.81 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

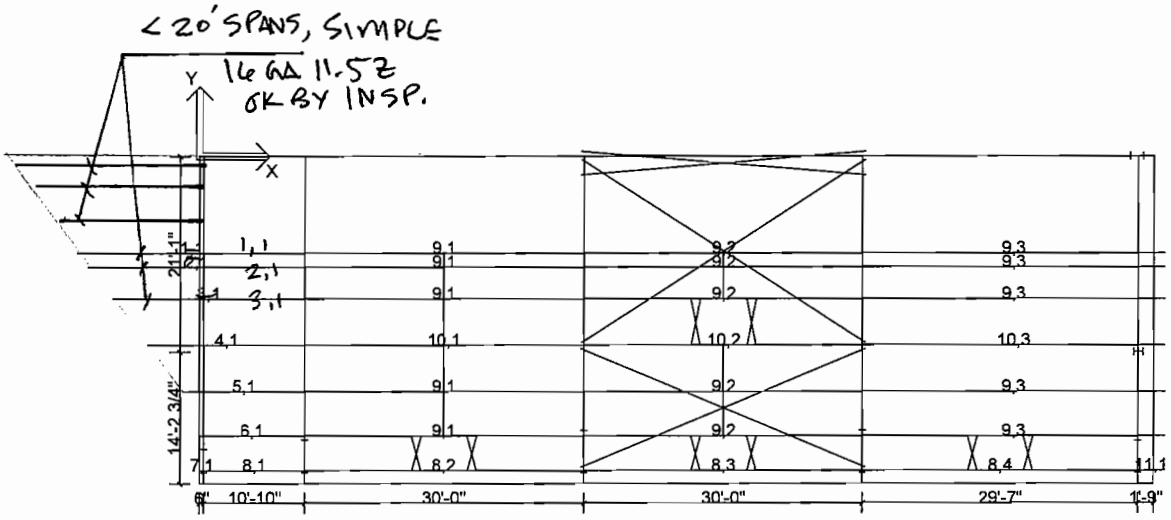
**Controlling Frame Deflection Ratios for Cross Section: Spandrel(Id=3,1)**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1039 ) | 0.341 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Roof: A**




**Maximum Secondary Designs for Shape Maintenance Area on Side A**

CHG. TO SPAN FL9 TO FL10. SAME/SIM TO 6,1 2 DESIGN

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 24.41 | 11.50x0.120 Z Sim | No | 0 | | | | | | | 1.90 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 2,1 | 23.29 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.98 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 3,1 | 20.67 | 11.50x0.120 Z Sim | No | 0 | | | | | | | 2.12 | 0.35 | 1.12 | 0.00 | 16 | | | | | | |
| 4,1 | 16.88 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.94 | 0.37 | 0.70 | 0.00 | 16 | | | | | | |
| 5,1 | 13.08 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.14 | 0.59 | 0.59 | 0.00 | 16 | | | | | | |
| 6,1 | 11.33 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.01 | 0.46 | 0.46 | 0.00 | 16 | | | | | | |
| 7,1 | 0.50 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.00 | 0.01 | 0.01 | 0.00 | 16 | | | | | | |
| 8,1 | 10.83 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.43 | 0.01 | 0.28 | 0.00 | 16 | | | | | | |
| 8,2 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 8,3 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 8,4 | 29.58 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 1.02 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 9,1 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | | | | | | | 1.02 | 0.00 | 0.00 | 0.00 | 19 | 0.68 | 0.12 | 0.36 | 0.00 | 16 | 24 |
| 9,2 | 30.00 | 11.50x0.082 Z Con | Yes | 24 | 0.53 | 0.10 | 0.35 | 0.00 | 16 | 24 | 1.00 | 0.37 | 0.74 | 0.00 | 16 | 0.51 | 0.10 | 0.34 | 0.00 | 16 | 24 |
| 9,3 | 32.46 | 11.50x0.120 Z Con | Yes | 24 | 0.66 | 0.12 | 0.35 | 0.00 | 16 | 24 | 0.96 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 10,1 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | | | | | | | 1.02 | 0.00 | 0.00 | 0.00 | 19 | 0.52 | 0.07 | 0.27 | 0.00 | 16 | 24 |
| 10,2 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | 0.20 | 0.03 | 0.45 | 0.00 | 41 | 24 | 0.42 | 0.06 | 0.95 | 0.00 | 41 | 0.27 | 0.04 | 0.53 | 0.00 | 41 | 24 |
| 10,3 | 32.46 | 11.50x0.120 Z Con | Yes | 24 | 0.39 | 0.06 | 0.53 | 0.00 | 41 | 24 | 0.96 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 11,1 | 2.87 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.00 | 0.03 | 0.00 | 16 | | | | | | |

**Maximum Secondary Deflections for Shape Maintenance Area on Side A**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 1.46 | ( L/201 ) | 11.50 | 1 | W1> |
| 2 | 1 | 0.71 | ( L/392 ) | 11.00 | 1 | W1> |
| 3 | 1 | -0.15 | ( L/889 ) | 14.34 | 1 | W1> |
| 4 | 1 | -0.04 | ( L/2938 ) | 10.04 | 1 | W1> |
| 5 | 1 | 0.04 | ( L/3252 ) | 7.75 | 1 | W1> |
| 6 | 1 | 0.05 | ( L/2562 ) | 6.00 | 1 | W1> |
| 7 | 1 | - | - | - | - | - |
| 8 | 1 | 0.05 | ( L/2590 ) | 5.50 | 1 | W1> |
| 8 | 2 | 1.06 | ( L/339 ) | 25.83 | 1 | W1> |
| 8 | 3 | 1.06 | ( L/339 ) | 55.83 | 1 | W1> |

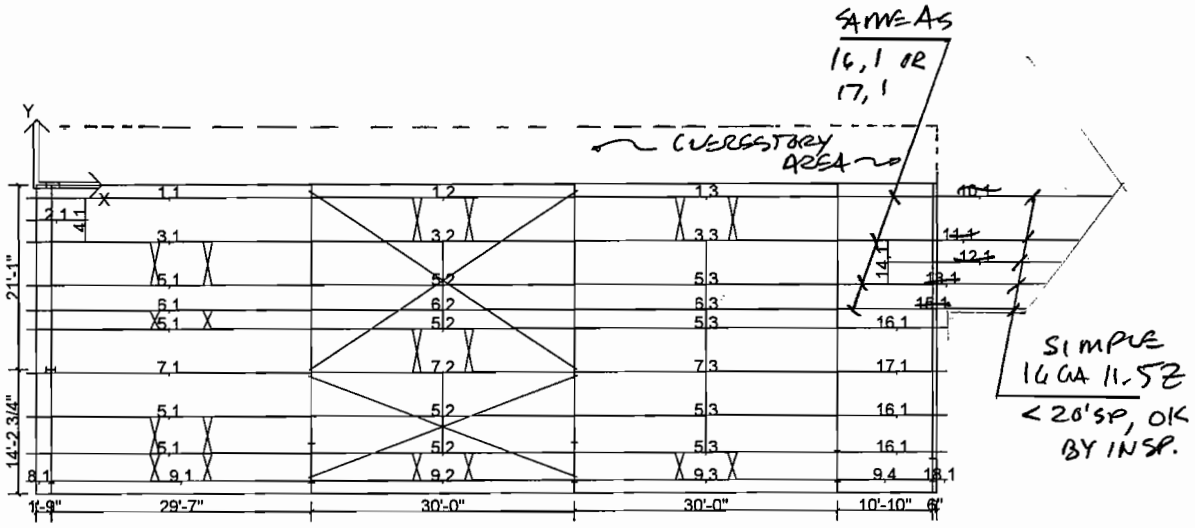
| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | 4 | 1.04 | ( L/341 ) | 85.83 | 1 | W1> |
| 9 | 1 | -0.66 | ( L/547 ) | 13.00 | 7 | L |
| 9 | 2 | 0.07 | ( L/5473 ) | 34.00 | 7 | L |
| 9 | 3 | -0.61 | ( L/585 ) | 76.50 | 7 | L |
| 10 | 1 | -0.65 | ( L/553 ) | 13.00 | 7 | L |
| 10 | 2 | -0.12 | ( L/2892 ) | 50.50 | 3 | WP |
| 10 | 3 | -0.60 | ( L/590 ) | 76.50 | 7 | L |
| 11 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Maintenance Area, Roof A, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.065 | -8.53 | 1 | 8 | 24.41 | Y | 35.31 | 0.814 | 0.000 |
| 2 | 0.120 | -14.22 | 1 | 7 | 30.00 | N | 35.31 | 1.000 | 0.000 |
| 3 | 0.082 | -14.22 | 1 | 7 | 30.00 | N | 35.31 | 1.000 | 0.000 |
| 4 | 0.120 | -15.38 | 1 | 8 | 32.46 | N | 35.31 | 1.082 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.02 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 0.16 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 0.33 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 0.35 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 0.20 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

**Roof: B**




**Maximum Secondary Designs for Shape Maintenance Area on Side B**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 32.46 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 1.01 | 0.00 | 0.00 | 0.00 | 16 | 0.75 | 0.28 | 0.62 | 0.00 | 16 | 48 |
| 1,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.86 | 0.23 | 0.60 | 0.00 | 16 | 48 | 0.82 | 0.35 | 0.63 | 0.00 | 16 | 0.60 | 0.11 | 0.40 | 0.00 | 16 | 48 |
| 1,3 | 30.00 | 11.50x0.120 Z Con | Yes | 48 | 0.77 | 0.13 | 0.41 | 0.00 | 16 | 48 | 0.87 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 2,1 | 6.75 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.15 | 0.26 | 0.28 | 0.00 | 16 | | | | | | |
| 3,1 | 32.46 | 11.50x0.120 Z Con | Yes | 24 | | | | | | | 0.99 | 0.00 | 0.00 | 0.00 | 19 | 0.75 | 0.13 | 0.40 | 0.00 | 16 | 24 |
| 3,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.51 | 0.11 | 0.39 | 0.00 | 16 | 24 | 1.00 | 0.42 | 0.84 | 0.00 | 16 | 0.53 | 0.11 | 0.40 | 0.00 | 16 | 24 |
| 3,3 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | 0.54 | 0.14 | 0.41 | 0.00 | 16 | 24 | 0.74 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 4,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.34 | 0.05 | 0.08 | 0.00 | 16 | | | | | | |
| 5,1 | 32.46 | 11.50x0.082 Z Con | Yes | 24 | | | | | | | 1.02 | 0.00 | 0.74 | 0.00 | 19 | 0.54 | 0.29 | 0.61 | 0.00 | 19 | 24 |
| 5,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.63 | 0.18 | 0.44 | 0.00 | 16 | 24 | 0.88 | 0.32 | 0.65 | 0.00 | 16 | 0.45 | 0.09 | 0.30 | 0.00 | 16 | 24 |
| 5,3 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | 0.58 | 0.10 | 0.31 | 0.00 | 16 | 24 | 0.97 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 6,1 | 32.46 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.90 | 0.00 | 0.64 | 0.00 | 19 | 0.45 | 0.33 | 0.56 | 0.00 | 19 | 24 |
| 6,2 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.45 | 0.27 | 0.53 | 0.00 | 19 | 24 | 0.67 | 0.47 | 0.81 | 0.00 | 19 | 0.46 | 0.27 | 0.54 | 0.00 | 19 | 24 |
| 6,3 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.46 | 0.33 | 0.57 | 0.00 | 19 | 24 | 0.93 | 0.00 | 0.66 | 0.00 | 19 | | | | | | |
| 7,1 | 32.46 | 11.50x0.120 Z Con | Yes | 24 | | | | | | | 0.96 | 0.00 | 0.00 | 0.00 | 19 | 0.37 | 0.06 | 0.52 | 0.00 | 41 | 24 |
| 7,2 | 30.00 | 11.50x0.120 Z Con | Yes | 48 | 0.26 | 0.03 | 0.52 | 0.00 | 41 | 24 | 0.40 | 0.06 | 0.93 | 0.00 | 41 | 0.23 | 0.03 | 0.49 | 0.00 | 41 | 24 |
| 7,3 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | 0.51 | 0.07 | 0.26 | 0.00 | 16 | 24 | 1.02 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 8,1 | 2.87 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.00 | 0.03 | 0.00 | 16 | | | | | | |
| 9,1 | 29.58 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.94 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 9,2 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 9,3 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.00 | 0.00 | 19 | | | | | | |
| 9,4 | 10.83 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.37 | 0.00 | 0.24 | 0.00 | 16 | | | | | | |
| ~~10,1~~ | ~~31.21~~ | ~~11.50x0.120 Z Sim~~ | No | 0 | | | | | | | 1.85 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| ~~11,1~~ | ~~27.41~~ | ~~11.50x0.120 Z Sim~~ | No | 0 | | | | | | | 1.14 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 12,1 | 19.76 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.65 | 0.01 | 0.43 | 0.00 | 16 | | | | | | |
| ~~13,1~~ | ~~23.62~~ | ~~11.50x0.120 Z Sim~~ | Yes | 0 | | | | | | | 0.85 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 14,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.47 | 0.07 | 0.11 | 0.00 | 16 | | | | | | |
| ~~15,1~~ | ~~21.46~~ | ~~11.50x0.082 Z Sim~~ | Yes | 0 | | | | | | | 0.94 | 0.33 | 0.76 | 0.00 | 16 | | | | | | |
| 16,1 | 12.46 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.06 | 0.43 | 0.44 | 0.00 | 16 | | | | | | |
| 17,1 | 12.46 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.29 | 0.00 | 0.50 | 0.00 | 37 | | | | | | |
| 18,1 | 1.62 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.01 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |

**Maximum Secondary Deflections for Shape Maintenance Area on Side B**

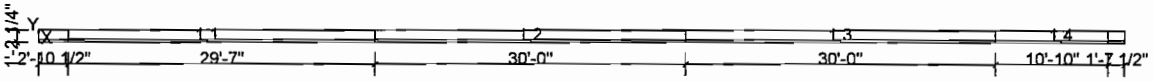
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.90 | ( L/394 ) | 15.88 | 1 | W1> |
| 1 | 2 | -0.15 | ( L/2443 ) | 40.96 | 3 | WP |
| 1 | 3 | 0.70 | ( L/515 ) | 78.96 | 1 | W1> |
| 2 | 1 | - | - | - | - | - |
| 3 | 1 | 0.68 | ( L/523 ) | 15.88 | 1 | W1> |
| 3 | 2 | -0.07 | ( L/5377 ) | 58.46 | 1 | W1> |
| 3 | 3 | 0.73 | ( L/490 ) | 78.96 | 1 | W1> |
| 4 | 1 | - | - | - | - | - |
| 5 | 1 | -0.79 | ( L/450 ) | 15.88 | 7 | L |
| 5 | 2 | 0.08 | ( L/4794 ) | 36.96 | 7 | L |
| 5 | 3 | -0.64 | ( L/567 ) | 78.96 | 7 | L |
| 6 | 1 | -0.55 | ( L/640 ) | 15.88 | 7 | L |
| 6 | 2 | 0.06 | ( L/5964 ) | 57.46 | 7 | L |
| 6 | 3 | -0.61 | ( L/588 ) | 78.96 | 7 | L |
| 7 | 1 | -0.60 | ( L/596 ) | 15.88 | 7 | L |
| 7 | 2 | -0.16 | ( L/2304 ) | 43.96 | 3 | WP |
| 7 | 3 | -0.66 | ( L/547 ) | 78.96 | 7 | L |
| 8 | 1 | - | - | - | - | - |
| 9 | 1 | 0.96 | ( L/369 ) | 15.00 | 1 | W1> |
| 9 | 2 | 0.97 | ( L/372 ) | 44.58 | 1 | W1> |
| 9 | 3 | 0.97 | ( L/372 ) | 74.58 | 1 | W1> |
| 9 | 4 | 0.04 | ( L/2948 ) | 95.08 | 1 | W1> |
| 10 | 1 | 2.55 | ( L/147 ) | 16.00 | 1 | W1> |
| 11 | 1 | 1.23 | ( L/267 ) | 14.00 | 1 | W1> |
| 12 | 1 | 0.13 | ( L/1355 ) | 13.07 | 1 | W1> |
| 13 | 1 | 0.68 | ( L/420 ) | 12.00 | 1 | W1> |
| 14 | 1 | - | - | - | - | - |
| 15 | 1 | -0.07 | ( L/1957 ) | 6.50 | 1 | W1> |
| 16 | 1 | 0.04 | ( L/2942 ) | 5.50 | 1 | W1> |
| 17 | 1 | 0.04 | ( L/3012 ) | 5.50 | 1 | W1> |
| 18 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Maintenance Area, Roof B, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.082 | -21.57 | 1 | 10 | 32.46 | N | 35.31 | 1.082 | 0.000 |
| 2 | 0.082 | -19.91 | 1 | 9 | 30.00 | N | 35.31 | 1.000 | 0.000 |
| 3 | 0.120 | -19.91 | 1 | 9 | 30.00 | N | 35.31 | 1.000 | 0.000 |
| 4 | 0.065 | -12.05 | 1 | 10 | 31.21 | Y | 35.31 | 1.040 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.34 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 0.48 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 0.37 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 0.18 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 0.03 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Wall: 2 - Canopy 1




**Maximum Secondary Designs for Shape Maintenance Area on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 32.46 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.91 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 1,2 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 1,3 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 1,4 | 12.46 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.21 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |

**Maximum Secondary Deflections for Shape Maintenance Area on Side 2**

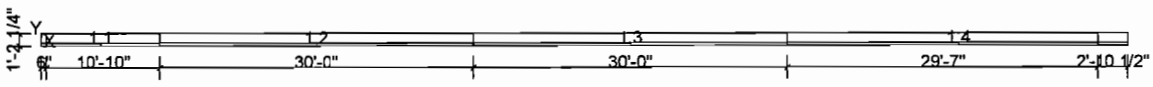
| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.73 | ( L/485 ) | 17.88 | 1 | W1> |
| 1 | 2 | 0.79 | ( L/455 ) | 47.46 | 1 | W1> |
| 1 | 3 | 0.79 | ( L/455 ) | 77.46 | 1 | W1> |
| 1 | 4 | 0.00 | ( L/7121 ) | 97.96 | 1 | W1> |

**Purlin Anchorage Forces for Shape Maintenance Area, Roof Wall: 2 - Canopy 1, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|

## Wall: 4 - Canopy 1




**Maximum Secondary Designs for Shape Maintenance Area on Side 4**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 11.33 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.23 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 1,2 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 1,3 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.95 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |
| 1,4 | 32.46 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.87 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |

**Maximum Secondary Deflections for Shape Maintenance Area on Side 4**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.00 | ( L/6302 ) | 6.00 | 1 | W1> |
| 1 | 2 | 0.79 | ( L/455 ) | 26.33 | 1 | W1> |
| 1 | 3 | 0.79 | ( L/455 ) | 56.33 | 1 | W1> |
| 1 | 4 | 0.70 | ( L/505 ) | 85.83 | 1 | W1> |

**Purlin Anchorage Forces for Shape Maintenance Area, Roof Wall: 4 - Canopy 1, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|

**Loads and Codes - Shape: Clerestory Frames**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.575)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 4/9/8
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 21.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.0981
Bracing Seismic Period: 0.0648
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 6) |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 6) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 20 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 21 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 23 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |

| | | | | |
|---|---|---|---|---|
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 41 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |

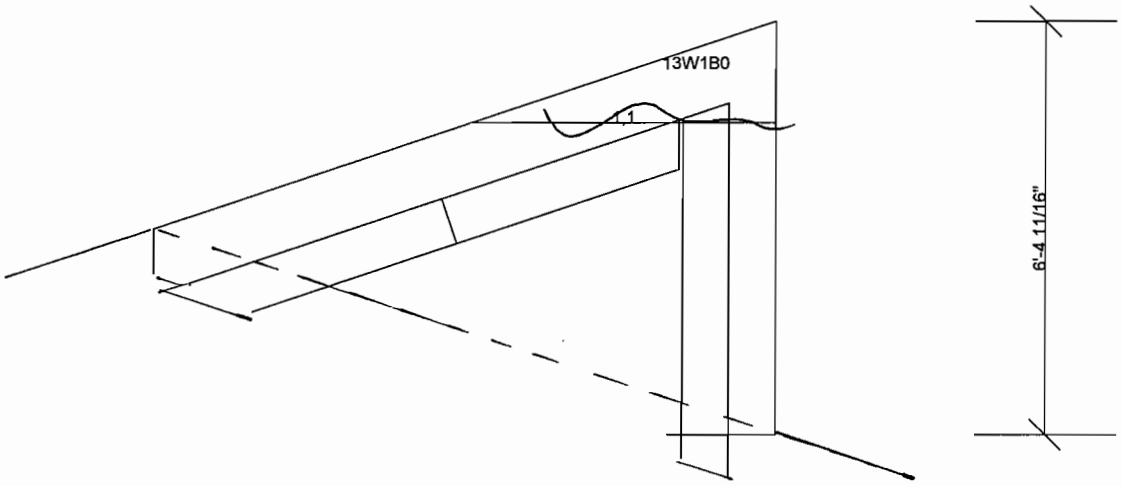
**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |

## Wall: 1




**Dimension Key**
1 3'-2 5/16"
2 1'-7 5/8"

NOT USED

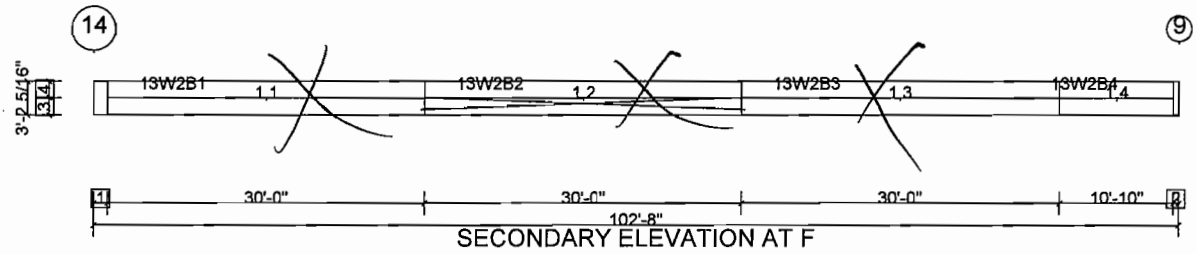
**Maximum Secondary Designs for Shape Clerestory Frames on Side 1**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior | | | | | | Interior | | | | | Exterior | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
| 1,1 | 4.69 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.09 | 0.00 | 0.06 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Clerestory Frames on Side 1**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | - | - | - | - | - |

**Wall: 2**



SECONDARY ELEVATION AT F

**Dimension Key**
1 1'-4"
2 6"
3 1'-7 9/16"
4 1'-6 3/4"

No WALL Here

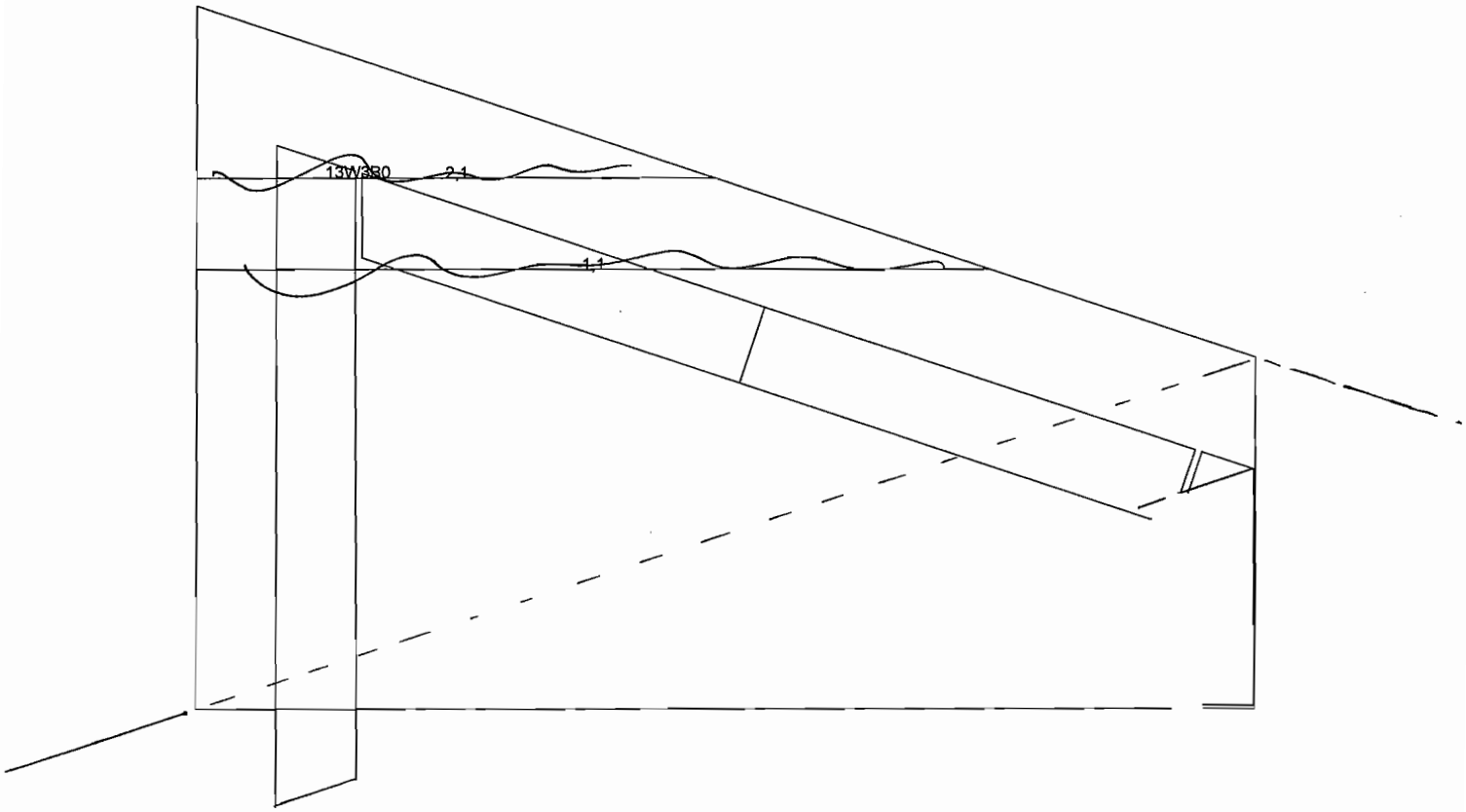
**Maximum Secondary Designs for Shape Clerestory Frames on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 30.00 | 8.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.87 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,2 | 30.00 | 8.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.87 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,3 | 30.00 | 8.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.87 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,4 | 10.83 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.23 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Clerestory Frames on Side 2**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 1.43 | ( L/252 ) | 15.00 | 1 | W1> |
| 1 | 2 | 1.43 | ( L/252 ) | 45.00 | 1 | W1> |
| 1 | 3 | 1.43 | ( L/252 ) | 75.00 | 1 | W1> |
| 1 | 4 | 0.04 | ( L/3187 ) | 95.50 | 1 | W1> |

**Wall: 3**




**Dimension Key**
1 4'-0"
2 9 15/16"
3 1'-6 3/4"

NOT USED

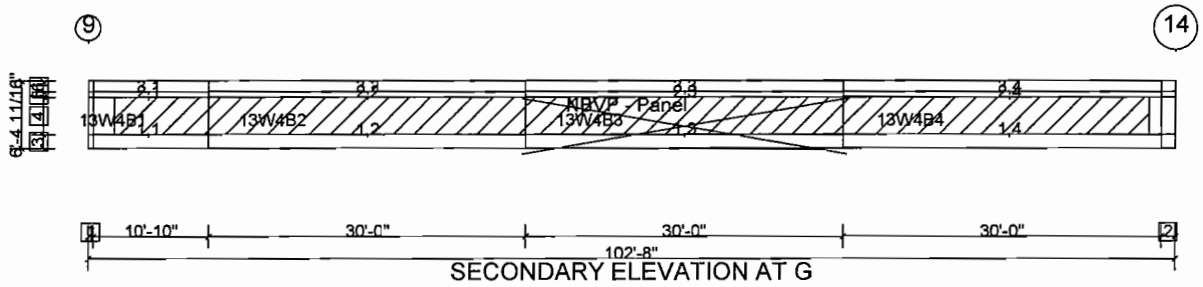
**Maximum Secondary Designs for Shape Clerestory Frames on Side 3**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 7.17 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.17 | 0.00 | 0.10 | 0.00 | 1 | | | | | | |
| 2,1 | 4.69 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Clerestory Frames on Side 3**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.00 | ( L/6613 ) | 3.50 | 1 | W1> |
| 2 | 1 | - | - | - | - | - |

## Wall: 4




SECONDARY ELEVATION AT G

(WALL @ CLERESTORY WINDOWS)

**Dimension Key**

1 6"
2 1'-4"
3 1'-3 15/16"
4 3'-6 1/4"
5 6 3/16"
6 1'-0 5/16"

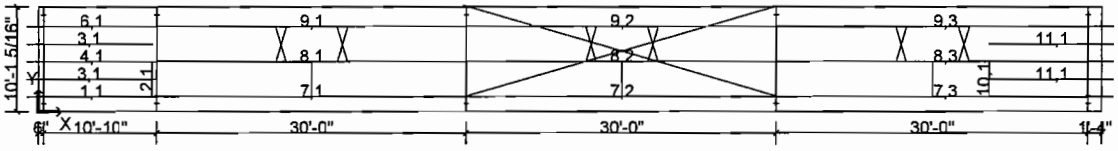
**Maximum Secondary Designs for Shape Clerestory Frames on Side 4**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 11.33 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.33 | 0.00 | 0.20 | 0.00 | 1 | | | | | | |
| 1,2 | 30.00 | 8.50x0.120 C Sim | Yes | 0 | | | | | | | 0.91 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,3 | 30.00 | 8.50x0.120 C Sim | Yes | 0 | | | | | | | 0.91 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,4 | 31.33 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 1.03 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,1 | 11.33 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.27 | 0.00 | 0.17 | 0.00 | 1 | | | | | | |
| 2,2 | 30.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.98 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,3 | 30.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.98 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,4 | 31.33 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.97 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 3,1 | 11.33 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.11 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 3,2 | 30.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.72 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 3,3 | 30.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.72 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 3,4 | 31.33 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.72 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Clerestory Frames on Side 4**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.06 | ( L/2091 ) | 6.00 | 1 | W1> |
| 1 | 2 | 1.54 | ( L/234 ) | 26.33 | 1 | W1> |
| 1 | 3 | 1.54 | ( L/234 ) | 56.33 | 1 | W1> |
| 1 | 4 | 1.73 | ( L/208 ) | 86.33 | 1 | W1> |
| 2 | 1 | 0.05 | ( L/2510 ) | 6.00 | 1 | W1> |
| 2 | 2 | 1.65 | ( L/218 ) | 26.33 | 1 | W1> |
| 2 | 3 | 1.65 | ( L/218 ) | 56.33 | 1 | W1> |
| 2 | 4 | 1.64 | ( L/220 ) | 86.33 | 1 | W1> |
| 3 | 1 | 0.00 | ( L/6686 ) | 6.00 | 1 | W1> |
| 3 | 2 | 0.98 | ( L/366 ) | 26.33 | 1 | W1> |
| 3 | 3 | 0.98 | ( L/366 ) | 56.33 | 1 | W1> |
| 3 | 4 | 0.97 | ( L/370 ) | 86.33 | 1 | W1> |

**Roof: A**




(ROOF OVER CLERESTORY AREA)

**Maximum Secondary Designs for Shape Clerestory Frames on Side A**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 12.46 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.10 | 0.55 | 0.55 | 0.00 | 14 | | | | | | |
| 2,1 | 3.40 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.52 | 0.12 | 0.15 | 0.00 | 14 | | | | | | |
| 3,1 | 12.00 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.28 | 0.28 | 0.00 | 14 | | | | | | |
| 4,1 | 12.46 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.08 | 0.44 | 0.44 | 0.00 | 14 | | | | | | |
| 5,1 | 3.40 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.32 | 0.07 | 0.09 | 0.00 | 14 | | | | | | |
| 6,1 | 12.46 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.07 | 0.35 | 0.36 | 0.00 | 14 | | | | | | |
| 7,1 | 30.00 | 11.50x0.082 Z Con | Yes | 24 | | | | | | | 0.92 | 0.00 | 0.59 | 0.00 | 17 | 0.64 | 0.22 | 0.47 | 0.00 | 14 | 24 |
| 7,2 | 30.00 | 11.50x0.082 Z Con | Yes | 24 | 0.56 | 0.18 | 0.45 | 0.00 | 14 | 24 | 0.92 | 0.33 | 0.75 | 0.00 | 14 | 0.47 | 0.09 | 0.35 | 0.00 | 14 | 24 |
| 7,3 | 32.46 | 11.50x0.120 Z Con | Yes | 24 | 0.68 | 0.12 | 0.36 | 0.00 | 14 | 24 | 0.79 | 0.00 | 0.00 | 0.00 | 17 | | | | | | |
| 8,1 | 30.00 | 11.50x0.082 Z Con | Yes | 36 | | | | | | | 0.93 | 0.00 | 0.00 | 0.00 | 17 | 0.76 | 0.30 | 0.57 | 0.00 | 14 | 36 |
| 8,2 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.69 | 0.24 | 0.54 | 0.00 | 14 | 24 | 1.00 | 0.58 | 0.91 | 0.00 | 14 | 0.54 | 0.10 | 0.40 | 0.00 | 14 | 24 |
| 8,3 | 32.46 | 11.50x0.120 Z Con | Yes | 48 | 0.76 | 0.14 | 0.41 | 0.00 | 14 | 48 | 0.76 | 0.00 | 0.00 | 0.00 | 17 | | | | | | |
| 9,1 | 30.00 | 11.50x0.120 Z Con | Yes | 24 | | | | | | | 0.89 | 0.00 | 0.00 | 0.00 | 17 | 0.72 | 0.13 | 0.38 | 0.00 | 14 | 24 |
| 9,2 | 30.00 | 11.50x0.082 Z Con | Yes | 24 | 0.49 | 0.11 | 0.37 | 0.00 | 14 | 24 | 0.99 | 0.40 | 0.83 | 0.00 | 14 | 0.52 | 0.11 | 0.39 | 0.00 | 14 | 24 |
| 9,3 | 32.46 | 11.50x0.120 Z Con | Yes | 24 | 0.76 | 0.14 | 0.40 | 0.00 | 14 | 24 | 0.95 | 0.00 | 0.00 | 0.00 | 17 | | | | | | |
| 10,1 | 3.40 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.55 | 0.13 | 0.16 | 0.00 | 14 | | | | | | |
| 11,1 | 12.00 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.07 | 0.28 | 0.28 | 0.00 | 14 | | | | | | |
| 12,1 | 3.40 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.34 | 0.08 | 0.10 | 0.00 | 14 | | | | | | |

**Maximum Secondary Deflections for Shape Clerestory Frames on Side A**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.06 | ( L/2171 ) | 7.13 | 1 | W1> |
| 2 | 1 | - | - | - | - | - |
| 3 | 1 | 0.00 | ( L/4284 ) | 6.63 | 1 | W1> |
| 4 | 1 | 0.04 | ( L/3576 ) | 7.13 | 1 | W1> |
| 5 | 1 | - | - | - | - | - |
| 6 | 1 | 0.04 | ( L/3276 ) | 7.13 | 1 | W1> |
| 7 | 1 | 0.83 | ( L/436 ) | 13.00 | 1 | W1> |
| 7 | 2 | -0.13 | ( L/2740 ) | 53.50 | 1 | W1> |
| 7 | 3 | 0.84 | ( L/429 ) | 77.00 | 1 | W1> |
| 8 | 1 | 0.82 | ( L/438 ) | 13.00 | 1 | W1> |
| 8 | 2 | -0.11 | ( L/3144 ) | 53.50 | 1 | W1> |
| 8 | 3 | 0.75 | ( L/479 ) | 76.50 | 1 | W1> |
| 9 | 1 | 0.70 | ( L/513 ) | 13.00 | 1 | W1> |
| 9 | 2 | -0.09 | ( L/4214 ) | 55.50 | 1 | W1> |
| 9 | 3 | 0.77 | ( L/466 ) | 76.50 | 1 | W1> |
| 10 | 1 | - | - | - | - | - |
| 11 | 1 | 0.00 | ( L/6209 ) | 4.50 | 1 | W1> |
| 12 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Clerestory Frames, Roof A, Panel Type is SLR2, Pitch = 4.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | Width | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.065 | -2.75 | 1 | 3 | 12.46 | Y | 10.11 | 0.415 | 0.000 |
| 2 | 0.082 | -6.17 | 1 | 3 | 30.00 | N | 10.11 | 1.000 | 0.000 |
| 3 | 0.082 | -6.17 | 1 | 3 | 30.00 | N | 10.11 | 1.000 | 0.000 |
| 4 | 0.120 | -6.86 | 1 | 3 | 32.46 | N | 10.11 | 1.082 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.01 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 0.17 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 0.30 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 0.28 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 0.17 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Framing - Summary Report

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

**Crane Schedule Information**

| Name | Type | Service Classification | Method of Operation | Capacity (Ton) | Bridge Span | Bridge Construction |
|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | Monorail Crane | C (Moderate Service) | Pendant Operated | 2.00 | N/A | N/A |

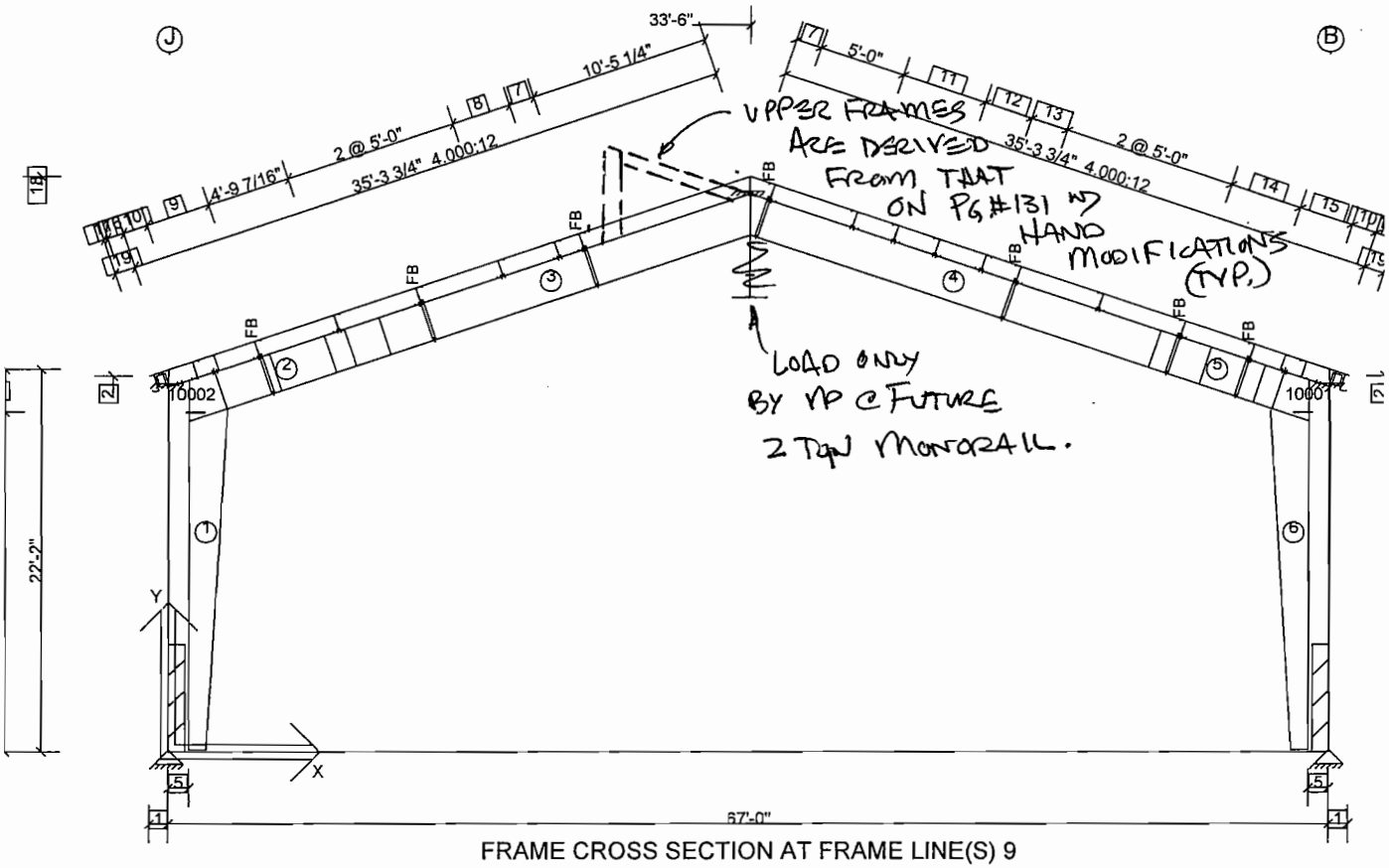
**Wall: 4**

| Name1 | Name2 | Type | Bracket Shape | Start Frame | Start Adjust. | End Frame | End Adjust. | Aisle | Start Elev. | From Left Edge | From Right Edge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 T. FUTURE Monorail | | Flexible Suspension - Hangers | NBVP | 1 | 0/3/0 | 5 | 0/3/0 | 1 | 26/4/0 | 33/5/12 | 0/0/0 |

| Type | Designed & Provided | Size | Size | Rail Size (lb/yd) | Vertical Deflection | Horizontal Deflection | Vertical Impact(%) | Lateral Impact(%) | Longitudinal Impact(%) |
|---|---|---|---|---|---|---|---|---|---|
| Wide Flange - Hot Rolled | NBVP | W 16 | | 0 | - | - | 10.00 | 20.00 | 10.00 |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Wall: 4, Frame at: 0/6/0**
Frame Cross Section: 9




FRAME CROSS SECTION AT FRAME LINE(S) 9

**Dimension Key**
1 1'-1 1/2"
2 21'-9 1/2"
3 33'-5 3/4" BL to CL of Runway Beam
4 33'-6 1/4" BL to CL of Runway Beam
5 1'-2"
6 2'-5 3/4"
7 1'-5 13/16"
8 3'-5 5/16"
9 3'-8 3/4"
10 1'-5 3/16"
11 2 @ 2'-6"
12 2'-10 3/16"
13 2'-1 13/16"
14 4'-2 11/16"
15 3'-2"
16 11 1/4"
17 3"
18 33'-4" Ridge Ht.
19 1'-2 1/4" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX200) and 6(CX201): 60'-3"

Vert. Clearance at member 1(CX200): 19'-10 1/4"
Vert. Clearance at member 6(CX201): 19'-8 1/8"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/6/0 | 5/11/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL | D + AD + CG + WP+AL |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 36 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 37 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.2500 | 0.1644 | 12.00 | 26.00 | 21.42 | 555.0 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.2500 | 0.1345 | 27.00 | 27.00 | 9.37 | 180.4 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.3125 | 0.1345 | 27.00 | 27.00 | 24.71 | 572.2 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 5.00 | 0.3125 | 0.1345 | 27.00 | 27.00 | 25.00 | 578.8 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 5.00 | 0.2500 | 0.1345 | 27.00 | 27.00 | 9.08 | 175.8 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.2500 | 0.1644 | 12.00 | 26.00 | 21.42 | 560.4 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 2691.5 (p) (Includes all plates)
Frame Pricing Weight = 2860.6 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 67/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 67/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10002 | 0/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 33/5/12 | 33/3/15 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 9**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 9-J | | 9-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.8 | 2.5 | -0.8 | 2.5 | - | - | - |
| AD | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| CG | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| L> | Frm | 3.3 | 8.4 | -3.3 | 7.7 | - | - | - |
| <L | Frm | 3.3 | 8.4 | -3.3 | 7.7 | - | - | - |
| S> | Frm | 0.4 | 1.1 | -0.4 | 1.0 | - | - | - |
| <S | Frm | 0.4 | 1.1 | -0.4 | 1.0 | - | - | - |
| US1* | Frm | 0.4 | 0.7 | -0.4 | 1.1 | - | - | - |
| *US1 | Frm | 0.3 | 0.7 | -0.3 | 0.5 | - | - | - |
| W1> | Frm | -3.9 | -6.3 | 0.2 | -4.5 | - | - | - |
| <W1 | Frm | -0.3 | -4.8 | 4.0 | -7.3 | - | - | - |
| W2> | Frm | -4.1 | -4.2 | -0.5 | -1.9 | - | - | - |
| <W2 | Frm | -0.5 | -2.7 | 3.3 | -4.8 | - | - | - |
| WP | Frm | -1.1 | -4.8 | -0.4 | -5.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.3 | 2.4 | -1.3 | 2.4 | - | - | - |
| L | Frm | 2.6 | 6.6 | -2.6 | 6.7 | - | - | - |
| S | Frm | 0.3 | 0.8 | -0.3 | 0.9 | - | - | - |
| E> | Frm | -0.2 | -0.2 | -0.2 | 0.2 | - | - | - |
| EG+ | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| <E | Frm | 0.2 | 0.2 | 0.2 | -0.2 | - | - | - |
| EG- | Frm | -0.0 | -0.1 | 0.0 | -0.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 9-J | 3.6 | 14 | 4.9 | 1 | - | - | - | - | 4.8 | 12 | 12.7 | 1 | - | - | - | - |
| 67/0/0 | 9-B | 4.9 | 1 | 3.5 | 13 | - | - | - | - | 5.8 | 13 | 12.1 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 5.2 | 5.0 |
| AD | 0.0 | 0.0 | 0.2 | 0.2 |
| CG | 0.0 | 0.0 | 3.6 | 3.6 |
| L> | 0.0 | 0.0 | 16.1 | 16.1 |
| <L | 0.0 | 0.0 | 16.1 | 16.1 |
| S> | 0.0 | 0.0 | 2.0 | 2.0 |
| <S | 0.0 | 0.0 | 2.0 | 2.0 |
| US1* | 0.0 | 0.0 | 1.8 | 1.8 |
| *US1 | 0.0 | 0.0 | 1.2 | 1.2 |
| W1> | 3.7 | 3.7 | 10.8 | 10.8 |
| <W1 | 3.7 | 3.7 | 12.1 | 12.1 |
| W2> | 4.6 | 4.6 | 6.1 | 6.1 |
| <W2 | 2.8 | 2.8 | 7.4 | 7.4 |
| WP | 1.5 | 1.5 | 9.8 | 9.8 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 5.0 | 4.7 |
| L | 0.0 | 0.0 | 13.4 | 13.4 |

| | | | | |
|---|---|---|---|---|
| S | 0.0 | 0.0 | 1.7 | 1.7 |
| E> | 0.5 | 0.5 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.2 | 0.2 |
| <E | 0.5 | 0.5 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.2 | 0.2 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 9-J | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 67/0/0 | 9-B | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 19.02 | 25.078 | 152.54 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 2 | 1 | S1 | 3.31 | 26.500 | 197.03 | 1.50 | 39.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 2 | 2 | S1 | 6.63 | 26.500 | 197.03 | 1.50 | 39.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 2.14 | 26.375 | 196.10 | 1.50 | 39.56 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 1 | S1 | 3.07 | 26.500 | 197.03 | 1.50 | 39.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 2 | S1 | 6.38 | 26.500 | 197.03 | 1.50 | 39.75 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 19.02 | 25.896 | 157.52 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |

**Brackets Part Summary**

| Mem. No. | Loc. (ft) | Total Length (in.) | Bracket Cut (in.) | Bracket Depth (in.) | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Hole Pitch (in.) | Stiffener or Plate | Part |
|---|---|---|---|---|---|---|---|---|---|---|

**Brackets Design Summary (vertical live load is with the impact factor)**

| Mem. No. | Loc. (ft) | Vert. Live Load (k) | Vert. Dead Load (k) | Lateral Impact (k) | Longitudinal Impact (k) | CL Dist to Flange (in.) | Member Depth1 (in.) | Member Depth2 (in.) | Web Thk (in.) | Flg Thk (in.) | Flg Width (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 8.00 | 30.25 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.25/2.00 | 12 | Flush | 2.00/2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 30.25 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.25/2.00 | 12 | Flush | 2.00/2.00 |
| 3 | 2 | SP | 0.375 | 6.00 | 32.09 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.63 |
| 4 | 1 | SP | 0.375 | 6.00 | 32.09 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.63 |
| 5 | 2 | KN(Face) | 0.375 | 6.00 | 32.50 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.25/2.00 | 31 | Extended | 3.25/2.00 |
| 6 | 2 | KN(Face) | 0.375 | 8.00 | 32.50 | 0.750 | A325X/ST | 3.00 | 32 | Extended | 3.25/2.00 | 31 | Extended | 3.25/2.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 2 | -8.1 | 9.5 | 1052.9 | Thin plate | 212.1 | 970.6 | 12 | 2.6 | 4.0 | 581.5 | Thin plate | 159.0 | 604.0 |
| 2 | 1 | 2 | -8.1 | 9.5 | 1052.9 | Thin plate | 212.1 | 970.6 | 12 | 2.6 | 4.0 | 581.5 | Thin plate | 159.0 | 604.0 |
| 3 | 2 | 13 | 4.0 | 1.2 | 229.6 | Thin plate | 106.0 | 504.6 | 1 | -4.3 | 2.3 | 839.9 | Thin plate | 159.0 | 837.5 |
| 4 | 1 | 13 | 4.0 | 1.2 | 229.6 | Thin plate | 106.0 | 504.6 | 1 | -4.3 | 2.3 | 839.9 | Thin plate | 159.0 | 837.5 |
| 5 | 2 | 1 | -7.9 | 8.7 | 1071.4 | Thin plate | 212.1 | 970.6 | 13 | 3.8 | 4.6 | 598.7 | Thin plate | 159.0 | 833.7 |
| 6 | 2 | 1 | -7.9 | 8.7 | 1071.4 | Thin plate | 212.1 | 970.6 | 13 | 3.8 | 4.6 | 598.7 | Thin plate | 159.0 | 833.7 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 2/8/10 | 30/1/13 | FB3044 | |
| 3 | 4/8/0 | 20/4/6 | FB3044 | |
| 3 | 14/7/2 | 10/5/4 | FB3044 | |
| 4 | 1/2/0 | 1/5/13 | FB3044 | |
| 4 | 16/2/0 | 16/5/13 | FB3044 | |
| 5 | 1/2/0 | 26/5/13 | FB3044 | |
| 5 | 5/4/11 | 30/8/9 | FB3044 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.1 | 0.3 | -6.5 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.03 | 0.02 |
| 10002 | 2.42 | 11.50 | 1 | 1 | 0.1 | -0.2 | -5.4 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.03 | 0.01 |
| 1 | 19.78 | 26.00 | 2 | 2 | -12.9 | -4.5 | -1079.5 | 0.0 | 57.1 | 14.0 | 1382.1 | 250.2 | 0.84 | 0.32 |
| 2 | 0.74 | 27.00 | 2 | 2 | -8.1 | 9.5 | -1052.9 | 0.0 | 104.3 | 10.7 | 1275.2 | 95.9 | 0.86 | 0.89 |
| 3 | 19.46 | 27.00 | 1 | 2 | -5.2 | 7.5 | 894.9 | 0.0 | 61.2 | 7.4 | 931.5 | 132.8 | 1.00 | 1.00 |
| 4 | 0.79 | 27.00 | 2 | 1 | -5.1 | -7.2 | 833.7 | 0.0 | 61.2 | 7.4 | 931.5 | 132.8 | 0.88 | 0.96 |
| 5 | 7.55 | 27.00 | 1 | 1 | -7.9 | -7.4 | -1071.4 | 0.0 | 104.3 | 10.7 | 1275.2 | 95.9 | 0.88 | 1.00 |
| 6 | 19.78 | 26.00 | 1 | 1 | -12.3 | 4.6 | -1088.6 | 0.0 | 57.1 | 14.0 | 1382.7 | 250.2 | 0.83 | 0.33 |

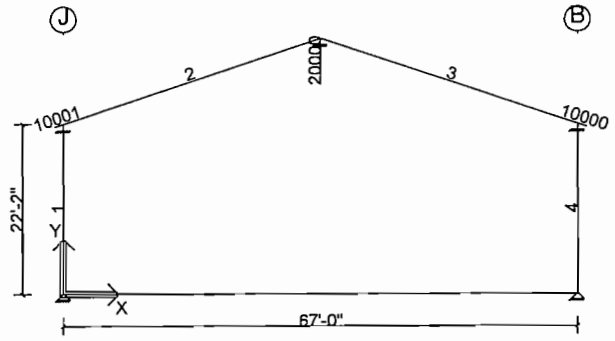
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.78 | 237.35 | 237.4 | 237.4 | 8.19 | 8.19 | 890.25 | 21.34 | 68.48 | 5.34 | 78.23 | 8.17 | 0.12 | 3537.90 | 1.65 | 1.00 | 1.00 | 0.65 | 0.83 |
| 2 | 0.74 | 386.08 | 18.9 | 18.9 | 6.06 | 6.06 | 655.82 | 5.21 | 48.58 | 2.09 | 57.05 | 3.24 | 0.07 | 932.68 | 1.00 | 1.00 | 1.00 | 0.94 | 0.59 |
| 3 | 19.46 | 386.08 | 126.4 | 126.4 | 6.67 | 6.67 | 762.10 | 6.52 | 56.45 | 2.61 | 65.09 | 4.03 | 0.12 | 1160.17 | 1.01 | 1.00 | 1.00 | 1.00 | 0.68 |
| 4 | 0.79 | 386.08 | 126.4 | 126.4 | 6.67 | 6.67 | 762.10 | 6.52 | 56.45 | 2.61 | 65.09 | 4.03 | 0.12 | 1160.17 | 1.01 | 1.00 | 1.00 | 1.00 | 0.76 |
| 5 | 7.55 | 386.08 | 25.9 | 25.9 | 6.06 | 6.06 | 655.82 | 5.21 | 48.58 | 2.09 | 57.05 | 3.24 | 0.07 | 932.68 | 1.09 | 1.00 | 1.00 | 0.94 | 0.59 |
| 6 | 19.78 | 237.35 | 237.4 | 237.4 | 8.19 | 8.19 | 890.25 | 21.34 | 68.48 | 5.34 | 78.23 | 8.17 | 0.12 | 3537.90 | 1.65 | 1.00 | 1.00 | 0.65 | 0.83 |

**User Defined Frame Point Loads for Cross Section: 9**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 746.95 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 1292.35 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -907.02 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -361.62 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -206.78 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 9**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Valley | -36.30 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Valley | -209.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Valley | -209.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Valley | -209.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Valley | -26.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Valley | -26.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Valley | -26.20 | 0/0/2 | -0.00 | 27/8/1 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Valley | 203.00 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | <W1 | Valley | 158.00 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | W2> | Valley | 107.60 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | <W2 | Valley | 63.20 | 0/0/2 | 0.00 | 27/8/1 | N | UP | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -20.49 | 0/0/0 | -20.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -118.22 | 0/0/0 | -118.15 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -118.22 | 0/0/0 | -118.15 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -118.22 | 0/0/0 | -118.15 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -14.78 | 0/0/0 | -14.77 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 114.39 | 0/0/0 | 114.33 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 89.37 | 0/0/0 | 89.32 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 60.77 | 0/0/0 | 60.74 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 35.75 | 0/0/0 | 35.73 | 9/11/3 | N | UP | 0.240 | OF |
| 3 | plf | W1> | Fix Valley | 100.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | <W1 | Fix Valley | 164.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | W2> | Fix Valley | 100.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | <W2 | Fix Valley | 163.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |
| 3 | plf | WP | Fix Valley | 180.00 | 0/0/2 | 0.00 | 14/8/9 | N | UP | 1.000 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 12 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 15 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 16 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 9**

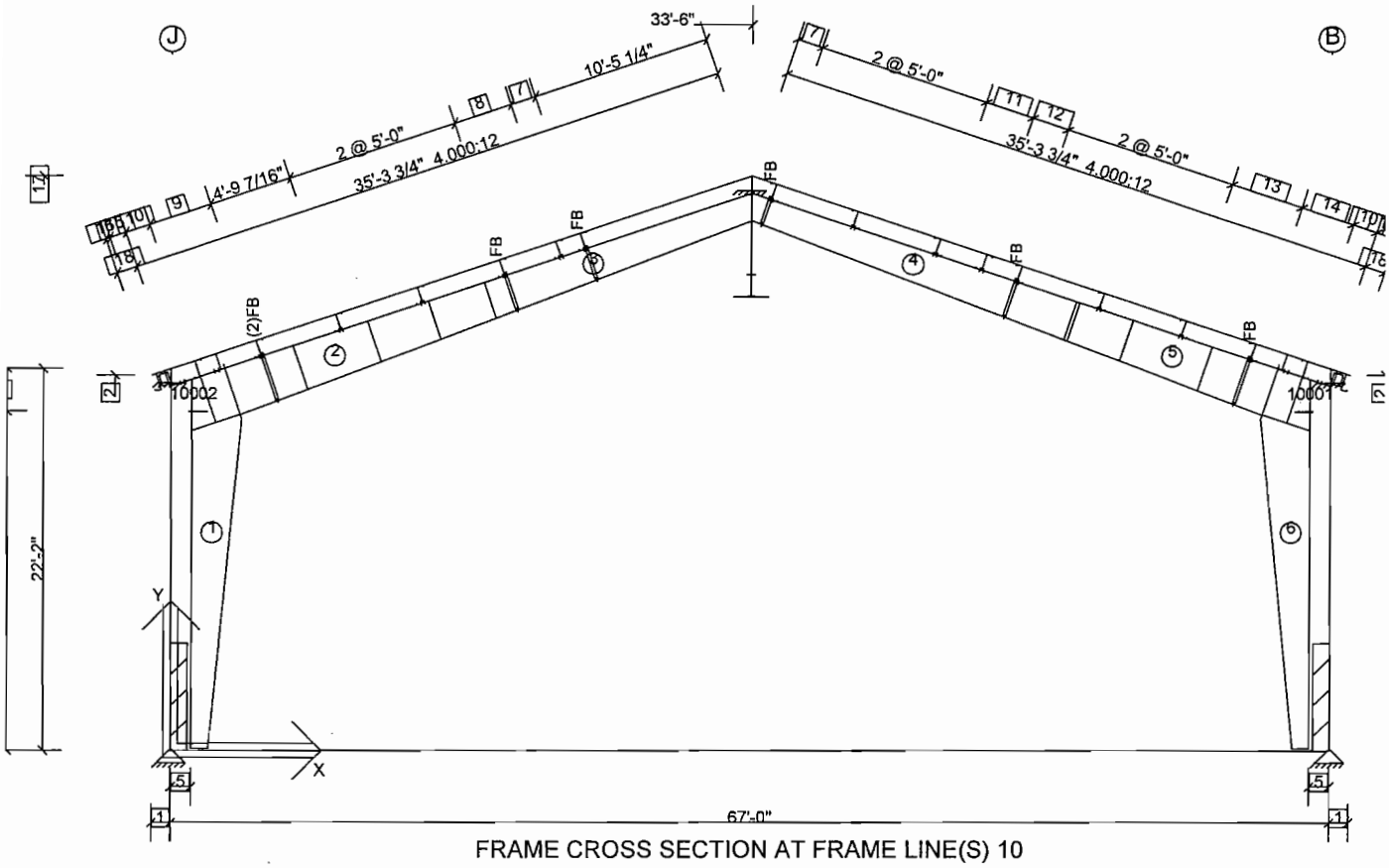
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/303 ) | 0.815 | 1 | 2 | 12 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/796 ) | -0.941 | 4 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Wall: 4, Frame at: 11/4/0

Frame Cross Section: 10




FRAME CROSS SECTION AT FRAME LINE(S) 10

**Dimension Key**

1 1'-1 1/2"
2 21'-9 1/2"
3 33'-5 3/4" BL to CL of Runway Beam
4 33'-6 1/4" BL to CL of Runway Beam
5 1'-2"
6 2'-5 3/4"
7 1'-5 13/16"
8 3'-5 5/16"
9 3'-8 3/4"
10 1'-5 3/16"
11 2'-10 3/16"
12 2'-1 13/16"
13 4'-2 11/16"
14 3'-2"
15 11 1/4"
16 3"
17 33'-4" Ridge Ht.
18 1'-2 1/4" 4.000:12

**Frame Clearances**

Horiz. Clearance between members 1(CX202) and 6(CX203): 58'-10 1/4"
Vert. Clearance at member 1(CX202): 19'-3 7/16"

Vert. Clearance at member 6(CX203): 19'-3 7/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 11/4/0 | 20/5/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL | D + AD + CG + WP+AL |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 36 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 37 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.5000 | 0.1875 | 12.00 | 34.00 | 21.42 | 957.5 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3750 | 0.1644 | 34.00 | 28.00 | 14.37 | 429.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.2500 | 0.1345 | 28.00 | 18.00 | 19.71 | 412.5 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1345 | 18.00 | 28.00 | 20.00 | 418.4 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3750 | 0.1644 | 28.00 | 34.00 | 14.08 | 419.9 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.5000 | 0.1875 | 12.00 | 34.00 | 21.42 | 957.5 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3663.8 (p) (Includes all plates)
Frame Pricing Weight = 3903.1 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 67/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 67/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10002 | 0/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 33/5/12 | 33/3/15 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 10**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 10-J | | 10-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.5 | 4.4 | -1.5 | 4.4 | - | - | - |
| AD | Frm | 0.2 | 0.3 | -0.2 | 0.3 | - | - | - |
| CG | Frm | 1.7 | 4.0 | -1.7 | 3.8 | - | - | - |
| L> | Frm | 6.0 | 14.1 | -6.0 | 14.1 | - | - | - |
| <L | Frm | 6.0 | 14.1 | -6.0 | 14.1 | - | - | - |
| S> | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| <S | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| US1* | Frm | 1.0 | 1.5 | -1.0 | 2.2 | - | - | - |
| *US1 | Frm | 0.5 | 1.5 | -0.5 | 0.8 | - | - | - |
| W1> | Frm | -11.6 | -15.7 | -2.1 | -8.6 | - | - | - |
| <W1 | Frm | 3.3 | -8.3 | 11.2 | -15.8 | - | - | - |
| W2> | Frm | -12.7 | -10.2 | -3.0 | -1.9 | - | - | - |
| <W2 | Frm | 2.2 | -2.9 | 10.4 | -9.1 | - | - | - |
| WP | Frm | -0.0 | -11.9 | -1.7 | -12.4 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.8 | 2.4 | -1.8 | 2.4 | - | - | - |
| L | Frm | 6.0 | 14.1 | -6.0 | 14.1 | - | - | - |
| S | Frm | 0.7 | 1.8 | -0.7 | 1.8 | - | - | - |
| E> | Frm | -0.6 | -0.4 | -0.6 | 0.4 | - | - | - |
| EG+ | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| <E | Frm | 0.6 | 0.4 | 0.6 | -0.4 | - | - | - |
| EG- | Frm | -0.1 | -0.2 | 0.1 | -0.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 10-J | 11.7 | 14 | 10.4 | 19 | - | - | - | - | 12.9 | 12 | 22.8 | 1 | - | - | - | - |
| 67/0/0 | 10-B | 10.1 | 20 | 10.2 | 13 | - | - | - | - | 13.0 | 13 | 22.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.1 | 8.8 |
| AD | 0.0 | 0.0 | 0.6 | 0.6 |
| CG | 0.0 | 0.0 | 7.8 | 7.8 |
| L> | 0.0 | 0.0 | 28.3 | 28.3 |
| <L | 0.0 | 0.0 | 28.3 | 28.3 |
| S> | 0.0 | 0.0 | 3.6 | 3.6 |
| <S | 0.0 | 0.0 | 3.6 | 3.6 |
| US1* | 0.0 | 0.0 | 3.7 | 3.7 |
| *US1 | 0.0 | 0.0 | 2.3 | 2.3 |
| W1> | 13.7 | 13.7 | 24.2 | 24.2 |
| <W1 | 14.5 | 14.5 | 24.1 | 24.1 |
| W2> | 15.6 | 15.6 | 12.1 | 12.1 |
| <W2 | 12.6 | 12.6 | 12.0 | 12.0 |
| WP | 1.8 | 1.8 | 24.3 | 24.3 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 5.0 | 4.8 |
| L | 0.0 | 0.0 | 28.3 | 28.3 |

| | | | | |
|---|---|---|---|---|
| S | 0.0 | 0.0 | 3.6 | 3.6 |
| E> | 1.3 | 1.3 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.4 | 0.4 |
| <E | 1.3 | 1.3 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.4 | 0.4 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 10-J | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 67/0/0 | 10-B | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 18.42 | 33.060 | 176.32 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.3750 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.12 | 31.246 | 190.06 | 1.50 | 46.87 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 2 | 2 | S1 | 8.64 | 29.045 | 176.68 | 1.75 | 50.83 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 3 | 1 | S1 | 0.04 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 2 | S1 | 3.48 | 25.711 | 191.16 | 1.50 | 38.57 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 1 | S1 | 19.75 | 27.393 | 203.67 | 1.50 | 41.09 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 1 | S1 | 3.23 | 28.859 | 175.54 | 1.50 | 43.29 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 5 | 2 | S1 | 8.07 | 31.272 | 190.22 | 1.75 | 54.73 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 6 | 1 | S9 | 18.42 | 33.060 | 176.32 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.3750 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Brackets Part Summary**

| Mem. No. | Loc. (ft) | Total Length (in.) | Bracket Cut (in.) | Bracket Depth (in.) | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Hole Pitch (in.) | Stiffener or Plate | Part |
|---|---|---|---|---|---|---|---|---|---|---|

**Brackets Design Summary (vertical live load is with the impact factor)**

| Mem. No. | Loc. (ft) | Vert. Live Load (k) | Vert. Dead Load (k) | Lateral Impact (k) | Longitudinal Impact (k) | CL Dist to Flange (in.) | Member Depth1 (in.) | Member Depth2 (in.) | Web Thk (in.) | Flg Thk (in.) | Flg Width (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 39.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 39.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.375 | 6.00 | 22.87 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.75 |
| 4 | 1 | SP | 0.375 | 6.00 | 22.87 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.75 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 39.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 39.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 2 | -15.2 | 14.9 | 1948.3 | Thin plate | 159.0 | 2112.1 | 12 | 6.8 | 10.0 | 1695.9 | Thin plate | 159.0 | 2112.1 |
| 2 | 1 | 2 | -15.2 | 14.9 | 1948.3 | Thin plate | 159.0 | 2112.1 | 12 | 6.8 | 10.0 | 1695.9 | Thin plate | 159.0 | 2112.1 |
| 3 | 2 | 14 | 0.9 | 2.1 | 129.2 | Thin plate | 106.0 | 355.7 | 22 | 1.5 | 1.2 | 442.1 | Thin plate | 159.0 | 607.1 |
| 4 | 1 | 14 | 0.9 | 2.1 | 129.2 | Thin plate | 106.0 | 355.7 | 22 | 1.5 | 1.2 | 442.1 | Thin plate | 159.0 | 607.1 |
| 5 | 2 | 20 | -12.5 | 11.4 | 2001.2 | Thin plate | 159.0 | 2093.5 | 13 | 8.9 | 9.4 | 1610.1 | Thin plate | 159.0 | 2093.5 |
| 6 | 2 | 20 | -12.5 | 11.4 | 2001.2 | Thin plate | 159.0 | 2093.5 | 13 | 8.9 | 9.4 | 1610.1 | Thin plate | 159.0 | 2093.5 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 2/2/8 | 30/1/13 | (2)FB4050 | |
| 3 | 4/8/0 | 15/4/6 | FB3034 | |
| 3 | 9/7/2 | 10/5/4 | FB3014 | |
| 4 | 1/2/0 | 1/5/13 | FB2104 | |
| 4 | 16/2/0 | 16/5/13 | FB3040 | |

| | | | |
|---|---|---|---|
| 5 | 10/4/11 | 30/8/9 | FB4050 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.3 | 0.8 | -17.8 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.09 | 0.04 |
| 10002 | 2.42 | 11.50 | 1 | 1 | 0.3 | -0.8 | -17.8 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.09 | 0.04 |
| 1 | 16.17 | 30.33 | 14 | 2 | 7.6 | -8.4 | 1493.6 | 0.0 | 445.5 | 18.3 | 2948.3 | 536.5 | 0.52 | 0.52 |
| 2 | 3.19 | 32.93 | 19 | 21 | -5.7 | 11.2 | -1538.6 | 0.0 | 64.6 | 11.1 | 1806.6 | 229.9 | 0.81 | 1.03 |
| 3 | 2.33 | 26.79 | 13 | 21 | 7.7 | 6.9 | -555.7 | 0.0 | 215.7 | 7.4 | 711.7 | 111.8 | 0.80 | 0.97 |
| 4 | 19.76 | 28.00 | 7 | 20 | 2.6 | -7.1 | -519.8 | 0.0 | 221.1 | 7.1 | 791.2 | 111.9 | 0.66 | 1.00 |
| 5 | 10.39 | 33.18 | 20 | 20 | -12.2 | -10.8 | -1782.1 | 0.0 | 69.8 | 11.0 | 1955.2 | 230.0 | 1.00 | 0.98 |
| 6 | 19.40 | 34.00 | 1 | 1 | -23.1 | 8.5 | -1972.9 | 0.0 | 118.6 | 16.2 | 3687.5 | 537.6 | 0.48 | 0.52 |

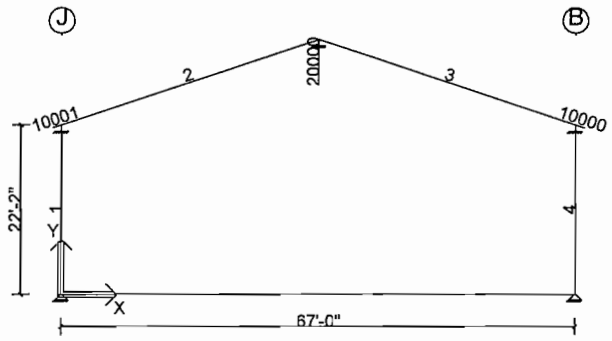
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 16.17 | 232.80 | 232.8 | 232.8 | 13.50 | 13.50 | 2174.59 | 42.68 | 143.38 | 10.67 | 159.67 | 16.26 | 0.73 | 9497.22 | 1.43 | 1.00 | 1.00 | 1.00 | 1.00 |
| 2 | 3.19 | 381.59 | 26.5 | 26.5 | 9.79 | 9.79 | 1648.32 | 13.51 | 100.13 | 4.50 | 115.79 | 6.97 | 0.26 | 3578.98 | 1.06 | 1.00 | 1.00 | 1.00 | 0.71 |
| 3 | 2.33 | 381.59 | 177.5 | 177.5 | 6.54 | 6.54 | 731.67 | 9.01 | 54.63 | 3.00 | 63.04 | 4.62 | 0.08 | 1585.23 | 1.02 | 1.00 | 1.00 | 0.84 | 1.00 |
| 4 | 19.76 | 381.59 | 170.7 | 170.7 | 6.70 | 6.70 | 810.66 | 9.01 | 57.90 | 3.00 | 67.05 | 4.62 | 0.09 | 1733.72 | 1.05 | 1.00 | 1.00 | 0.84 | 1.00 |
| 5 | 10.39 | 381.59 | 170.7 | 170.7 | 9.83 | 9.83 | 1677.86 | 13.51 | 101.14 | 4.50 | 117.03 | 6.97 | 0.26 | 3635.02 | 1.56 | 1.00 | 1.00 | 1.00 | 0.70 |
| 6 | 19.40 | 232.80 | 232.8 | 232.8 | 14.19 | 14.19 | 2806.18 | 42.68 | 165.07 | 10.67 | 185.05 | 16.29 | 0.74 | 11975.75 | 1.66 | 1.00 | 1.00 | 1.00 | 0.76 |

**User Defined Frame Point Loads for Cross Section: 10**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2572.50 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 4450.83 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -3123.75 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1245.42 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -714.58 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 10**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -70.76 | 0/0/0 | -70.76 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -408.33 | 0/0/0 | -408.33 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -408.33 | 0/0/0 | -408.33 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -408.33 | 0/0/0 | -408.33 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -51.04 | 0/0/0 | -51.04 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 395.12 | 0/0/0 | 395.12 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 308.69 | 0/0/0 | 308.69 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 209.90 | 0/0/0 | 209.90 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 123.47 | 0/0/0 | 123.47 | 9/11/3 | N | UP | 0.240 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 12 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 15 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 16 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 10**

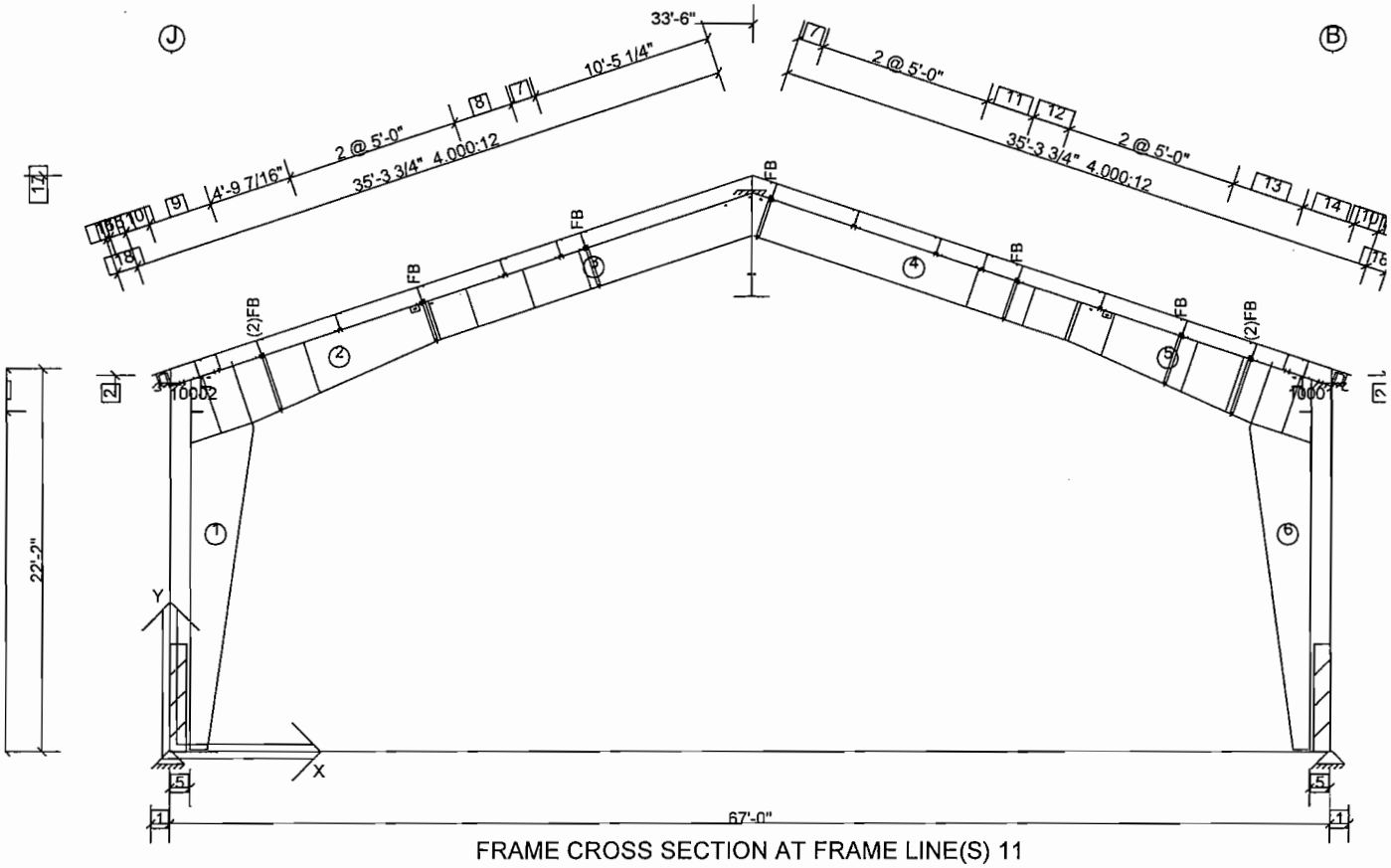
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/204 ) | 1.197 | 1 | 2 | 12 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/868 ) | -0.853 | 4 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 41/4/0**
Frame Cross Section: 11




FRAME CROSS SECTION AT FRAME LINE(S) 11

**Dimension Key**
1 1'-1 1/2"
2 21'-9 1/2"
3 33'-5 3/4" BL to CL of Runway Beam
4 33'-6 1/4" BL to CL of Runway Beam
5 1'-2"
6 2'-5 3/4"
7 1'-5 13/16"
8 3'-5 5/16"
9 3'-8 3/4"
10 1'-5 3/16"
11 2'-10 3/16"
12 2'-1 13/16"
13 4'-2 11/16"
14 3'-2"
15 11 1/4"
16 3"
17 33'-4" Ridge Ht.
18 1'-2 1/4" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX204) and 6(CX205): 57'-6 1/4"
Vert. Clearance at member 1(CX204): 18'-9 11/16"

Vert. Clearance at member 6(CX205): 18'-9 11/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 41/4/0 | 30/0/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. | Flg Width | Flg Thk | Web Thk | Depth1 | Depth2 | Length | Weight | Flg Fy | Web Fy | Splice | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | (in.) | (in.) | (in.) | (in.) | (in.) | (ft) | (p) | (ksi) | (ksi) | Jt.1 | Jt.2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.5000 | 0.1875 | 12.00 | 42.00 | 21.42 | 1032.3 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3750 | 0.1875 | 42.00 | 28.00 | 14.37 | 479.4 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.2500 | 0.1345 | 28.00 | 28.00 | 19.71 | 460.8 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1345 | 28.00 | 28.00 | 20.00 | 467.4 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3750 | 0.1875 | 28.00 | 42.00 | 14.08 | 468.7 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.5000 | 0.1875 | 12.00 | 42.00 | 21.42 | 1032.3 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 4009.8 (p) (Includes all plates)
Frame Pricing Weight = 4346.1 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 67/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 67/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 33/5/12 | 33/3/15 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 11**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 11-J | | 11-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 1.000 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 2.0 | 5.8 | -2.0 | 5.8 | - | - | - |
| AD | Frm | 0.3 | 0.4 | -0.3 | 0.4 | - | - | - |
| CG | Frm | 2.5 | 5.9 | -2.5 | 5.6 | - | - | - |
| L> | Frm | 8.7 | 20.8 | -8.7 | 20.8 | - | - | - |
| <L | Frm | 8.7 | 20.8 | -8.7 | 20.8 | - | - | - |
| S> | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| <S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| US1* | Frm | 1.4 | 2.2 | -1.4 | 3.2 | - | - | - |
| *US1 | Frm | 0.7 | 2.2 | -0.7 | 1.2 | - | - | - |
| W1> | Frm | -16.9 | -23.0 | -3.1 | -12.6 | - | - | - |
| <W1 | Frm | 4.9 | -12.2 | 16.5 | -23.1 | - | - | - |
| W2> | Frm | -18.5 | -14.9 | -4.5 | -2.8 | - | - | - |
| <W2 | Frm | 3.3 | -4.2 | 15.2 | -13.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.7 | 2.4 | -1.7 | 2.4 | - | - | - |
| L | Frm | 8.7 | 20.8 | -8.7 | 20.8 | - | - | - |
| S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| E> | Frm | -0.9 | -0.5 | -0.9 | 0.5 | - | - | - |
| EG+ | Frm | 0.1 | 0.3 | -0.1 | 0.3 | - | - | - |
| <E | Frm | 0.9 | 0.5 | 0.9 | -0.5 | - | - | - |
| EG- | Frm | -0.1 | -0.3 | 0.1 | -0.3 | - | - | - |
| WP | Frm | 1.7 | -14.1 | -3.4 | -14.1 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 11-J | 17.1 | 13 | 15.0 | 17 | - | - | - | - | 19.2 | 11 | 32.9 | 1 | - | - | - | - |
| 67/0/0 | 11-B | 14.7 | 18 | 15.1 | 12 | - | - | - | - | 19.4 | 12 | 32.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 11.9 | 11.7 |
| AD | 0.0 | 0.0 | 0.9 | 0.8 |
| CG | 0.0 | 0.0 | 11.4 | 11.4 |
| L> | 0.0 | 0.0 | 41.5 | 41.5 |
| <L | 0.0 | 0.0 | 41.5 | 41.5 |
| S> | 0.0 | 0.0 | 5.3 | 5.3 |
| <S | 0.0 | 0.0 | 5.3 | 5.3 |
| US1* | 0.0 | 0.0 | 5.4 | 5.4 |
| *US1 | 0.0 | 0.0 | 3.4 | 3.4 |
| W1> | 20.1 | 20.1 | 35.5 | 35.5 |
| <W1 | 21.4 | 21.4 | 35.3 | 35.4 |
| W2> | 23.0 | 23.0 | 17.7 | 17.7 |
| <W2 | 18.5 | 18.5 | 17.5 | 17.5 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 5.0 | 4.8 |
| L | 0.0 | 0.0 | 41.5 | 41.5 |
| S | 0.0 | 0.0 | 5.3 | 5.3 |
| E> | 1.8 | 1.8 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.6 | 0.6 |
| <E | 1.8 | 1.8 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.6 | 0.6 |
| WP | 1.6 | 1.6 | 28.2 | 28.2 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.0 |
| EB> | 0.0 | 0.0 | 0.0 | 0.0 |
| <EB | 0.0 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 11-J | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 67/0/0 | 11-B | 6 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.71 | 40.373 | 215.32 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.26 | 36.217 | 193.16 | 1.25 | 45.27 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 0.04 | 27.500 | 204.46 | 1.00 | 27.50 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 2 | S1 | 2.33 | 27.500 | 204.46 | 1.00 | 27.50 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 3 | S1 | 5.77 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 4 | S1 | 9.21 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 1 | S1 | 13.77 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 2 | S1 | 17.20 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 3 | S1 | 19.75 | 27.500 | 204.46 | 1.00 | 27.50 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 1 | S1 | 2.08 | 29.770 | 158.77 | 1.00 | 29.77 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 2 | S1 | 7.14 | 35.894 | 191.44 | 1.75 | 62.81 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 3 | S1 | 9.95 | 39.296 | 209.58 | 1.25 | 49.12 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.71 | 40.373 | 215.32 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Brackets Part Summary**

| Mem. No. | Loc. (ft) | Total Length (in.) | Bracket Cut (in.) | Bracket Depth (in.) | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Hole Pitch (in.) | Stiffener or Plate | Part |
|---|---|---|---|---|---|---|---|---|---|---|

**Brackets Design Summary (vertical live load is with the impact factor)**

| Mem. | Loc. | Vert. Live | Vert. Dead | Lateral | Longitudinal | CL Dist to | Member | Member | Web Thk | Flg Thk | Flg Width |
|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | (ft) | Load (k) | Load (k) | Impact (k) | Impact (k) | Flange (in.) | Depth1 (in.) | Depth2 (in.) | (in.) | (in.) | (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Outside Flange Configuration ID | Desc. | Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Desc. | Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.375 | 6.00 | 33.14 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.56 |
| 4 | 1 | SP | 0.375 | 6.00 | 33.14 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.56 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - Out Design Proc. | Shear (k) | Moment (in-k) | Required Strength - In Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - In Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 17 | -8.8 | 12.8 | 2424.3 | Thin plate | 159.0 | 2628.8 | 11 | 10.5 | 14.3 | 2366.0 | Thin plate | 159.0 | 2628.8 |
| 2 | 1 | 17 | -8.8 | 12.8 | 2424.3 | Thin plate | 159.0 | 2628.8 | 11 | 10.5 | 14.3 | 2366.0 | Thin plate | 159.0 | 2628.8 |
| 3 | 2 | 11 | 10.6 | 0.9 | 145.0 | Thin plate | 106.0 | 579.7 | 37 | 0.4 | 1.6 | 770.7 | Thin plate | 159.0 | 988.4 |
| 4 | 1 | 11 | 10.6 | 0.9 | 145.0 | Thin plate | 106.0 | 579.7 | 37 | 0.4 | 1.6 | 770.7 | Thin plate | 159.0 | 988.4 |
| 5 | 2 | 18 | -18.4 | 15.7 | 2727.7 | Thin plate | 159.0 | 2613.5 | 12 | 13.7 | 13.2 | 2264.5 | Thin plate | 159.0 | 2613.5 |
| 6 | 2 | 18 | -18.4 | 15.7 | 2727.7 | Thin plate | 159.0 | 2613.5 | 12 | 13.7 | 13.2 | 2264.5 | Thin plate | 159.0 | 2613.5 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/8/12 | 30/1/13 | (2)FB4100 | |
| 2 | 11/6/3 | 20/4/6 | FB4020 | |
| 3 | 9/7/2 | 10/5/4 | FB3054 | |
| 4 | 1/2/0 | 1/5/13 | FB3054 | |
| 4 | 16/2/0 | 16/5/13 | FB3054 | |
| 5 | 6/2/0 | 26/5/13 | FB4070 | |
| 5 | 10/4/11 | 30/8/9 | (2)FB4104 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.4 | 1.1 | -26.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.13 | 0.06 |
| 10002 | 2.42 | 11.50 | 1 | 1 | 0.4 | -1.1 | -26.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.13 | 0.06 |
| 1 | 18.94 | 42.00 | 2 | 2 | -33.7 | -11.5 | -2614.1 | 0.0 | 124.5 | 13.0 | 4556.0 | 539.9 | 0.60 | 0.88 |
| 2 | 1.20 | 42.00 | 2 | 17 | -22.4 | 12.8 | -2577.3 | 0.0 | 217.9 | 12.8 | 4129.4 | 234.7 | 0.68 | 1.00 |
| 3 | 0.00 | 28.00 | 13 | 2 | 0.8 | 10.4 | 1007.2 | 0.0 | 221.1 | 10.3 | 1500.5 | 111.9 | 0.67 | 1.01 |
| 4 | 15.78 | 28.00 | 13 | 37 | -1.2 | -7.3 | -738.1 | 0.0 | 41.9 | 7.1 | 844.3 | 111.9 | 0.79 | 1.03 |
| 5 | 11.57 | 42.00 | 18 | 18 | -18.4 | -14.0 | -2727.7 | 0.0 | 217.9 | 21.0 | 4129.4 | 234.7 | 0.70 | 0.98 |
| 6 | 18.94 | 42.00 | 1 | 1 | -33.4 | 11.5 | -2622.5 | 0.0 | 124.5 | 13.0 | 4556.3 | 539.9 | 0.60 | 0.89 |

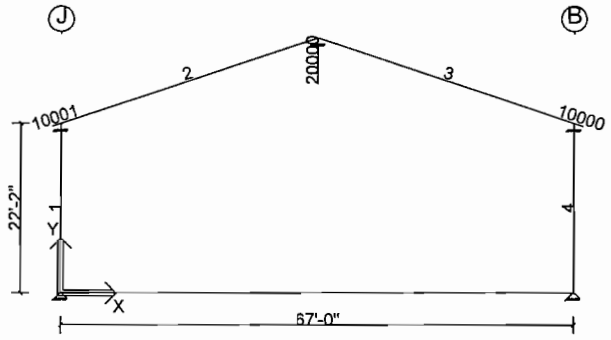
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 18.94 | 227.27 | 227.3 | 227.3 | 15.69 | 15.69 | 4521.56 | 42.69 | 215.31 | 10.67 | 244.80 | 16.36 | 0.76 | 18380.37 | 1.66 | 1.00 | 1.00 | 1.00 | 0.70 |
| 2 | 1.20 | 374.22 | 29.1 | 29.1 | 12.23 | 12.23 | 3045.98 | 13.52 | 145.05 | 4.51 | 173.42 | 7.11 | 0.30 | 5857.48 | 1.00 | 1.00 | 1.00 | 1.00 | 0.54 |
| 3 | 0.00 | 374.22 | 119.1 | 60.0 | 6.70 | 6.70 | 810.66 | 9.01 | 57.90 | 3.00 | 67.05 | 4.62 | 0.09 | 1733.72 | 1.48 | 1.00 | 1.00 | 0.84 | 1.00 |
| 4 | 15.78 | 374.23 | 180.0 | 180.0 | 6.70 | 6.70 | 810.66 | 9.01 | 57.90 | 3.00 | 67.05 | 4.62 | 0.09 | 1733.71 | 1.29 | 1.00 | 1.00 | 0.84 | 0.72 |
| 5 | 11.57 | 374.23 | 14.0 | 14.0 | 12.23 | 12.23 | 3045.98 | 13.52 | 145.05 | 4.51 | 173.42 | 7.11 | 0.30 | 5857.48 | 1.03 | 1.00 | 1.00 | 1.00 | 0.54 |
| 6 | 18.94 | 227.27 | 227.3 | 227.3 | 15.69 | 15.69 | 4521.56 | 42.69 | 215.31 | 10.67 | 244.80 | 16.36 | 0.76 | 18380.37 | 1.66 | 1.00 | 1.00 | 1.00 | 0.70 |

**User Defined Frame Point Loads for Cross Section: 11**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 3780.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 6540.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -4590.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1830.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -1050.00 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 11**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -103.98 | 0/0/0 | -103.98 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -75.00 | 0/0/0 | -75.00 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 580.59 | 0/0/0 | 580.59 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 453.59 | 0/0/0 | 453.59 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 308.43 | 0/0/0 | 308.43 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 181.43 | 0/0/0 | 181.43 | 9/11/3 | N | UP | 0.240 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |

| | | | | | | |
|---|---|---|---|---|---|---|
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

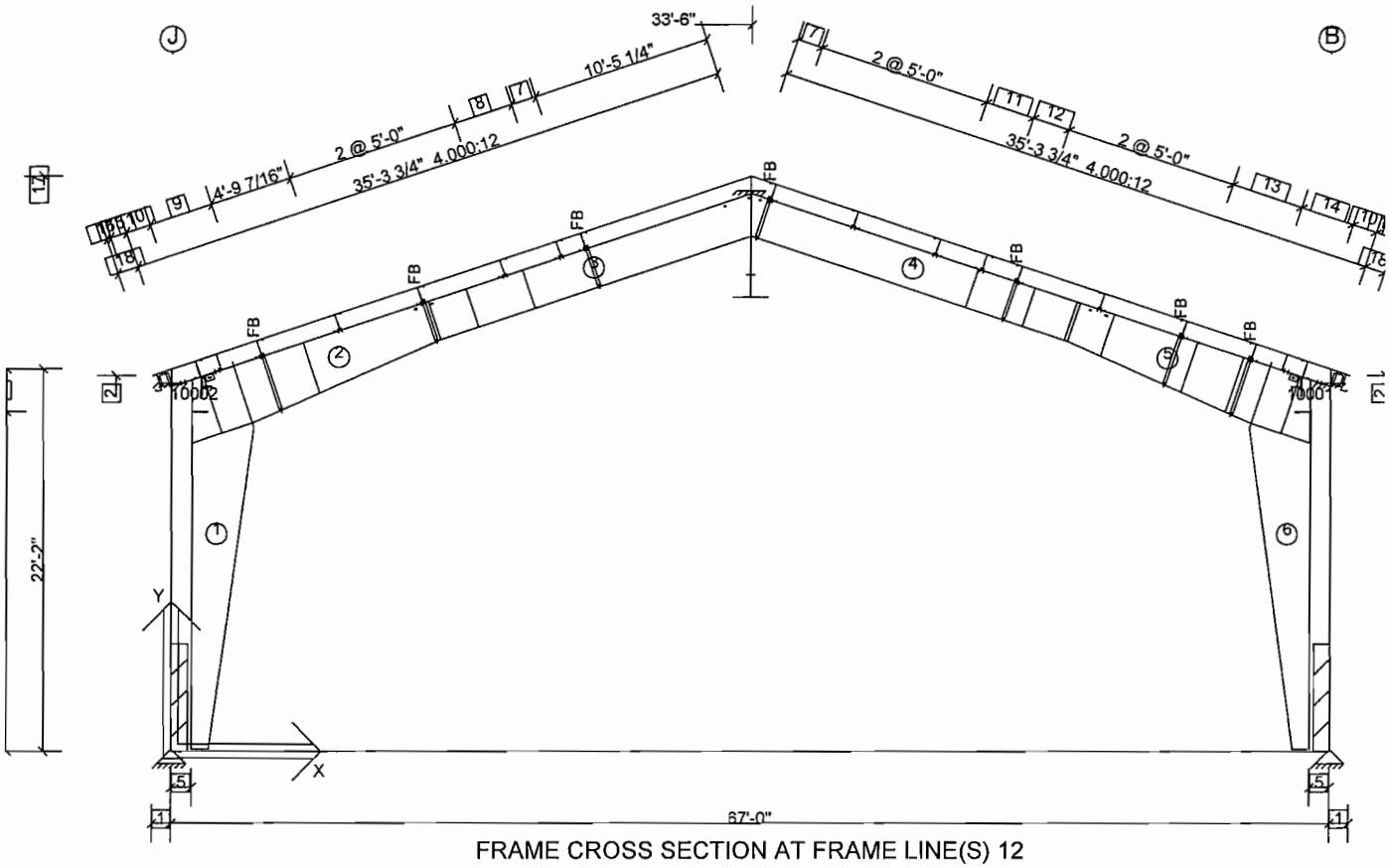
**Controlling Frame Deflection Ratios for Cross Section: 11**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/206 ) | 1.171 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/996 ) | -0.735 | 4 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 4, Frame at: 71/4/0**
Frame Cross Section: 12




FRAME CROSS SECTION AT FRAME LINE(S) 12

**Dimension Key**
1 1'-1 1/2"
2 21'-9 1/2"
3 33'-5 3/4" BL to CL of Runway Beam
4 33'-6 1/4" BL to CL of Runway Beam
5 1'-2"
6 2'-5 3/4"
7 1'-5 13/16"
8 3'-5 5/16"
9 3'-8 3/4"
10 1'-5 3/16"
11 2'-10 3/16"
12 2'-1 13/16"
13 4'-2 11/16"
14 3'-2"
15 11 1/4"
16 3"
17 33'-4" Ridge Ht.
18 1'-2 1/4" 4.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX206) and 6(CX207): 57'-6 1/4"
Vert. Clearance at member 1(CX206): 18'-9 11/16"

Vert. Clearance at member 6(CX207): 18'-9 11/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 71/4/0 | 29/9/8 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 16 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 52 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 54 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 55 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. | Flg Width | Flg Thk | Web Thk | Depth1 | Depth2 | Length | Weight | Flg Fy | Web Fy | Splice | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| No. | (in.) | (in.) | (in.) | (in.) | (in.) | (ft) | (p) | (ksi) | (ksi) | Jt.1 | Jt.2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.5000 | 0.1875 | 12.00 | 42.00 | 21.42 | 1032.3 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3750 | 0.1875 | 42.00 | 28.00 | 14.37 | 479.4 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.2500 | 0.1345 | 28.00 | 28.00 | 19.71 | 460.8 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1345 | 28.00 | 28.00 | 20.00 | 467.4 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3750 | 0.1875 | 28.00 | 42.00 | 14.08 | 468.7 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.5000 | 0.1875 | 12.00 | 42.00 | 21.42 | 1032.3 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 4009.8 (p) (Includes all plates)
Frame Pricing Weight = 4326.4 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 67/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 67/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 33/5/12 | 33/3/15 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 12**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | 12-J | | 12-B | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 1.000 | | | | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 2.0 | 5.8 | -2.0 | 5.8 | - | - | - |
| AD | Frm | 0.3 | 0.4 | -0.3 | 0.4 | - | - | - |
| CG | Frm | 2.5 | 5.8 | -2.5 | 5.5 | - | - | - |
| L> | Frm | 8.6 | 20.6 | -8.6 | 20.6 | - | - | - |
| <L | Frm | 8.6 | 20.6 | -8.6 | 20.6 | - | - | - |
| S> | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| <S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| US1* | Frm | 1.4 | 2.2 | -1.4 | 3.2 | - | - | - |
| *US1 | Frm | 0.7 | 2.2 | -0.7 | 1.2 | - | - | - |
| W1> | Frm | -17.1 | -23.1 | -3.0 | -12.8 | - | - | - |
| <W1 | Frm | 4.4 | -12.5 | 16.5 | -23.4 | - | - | - |
| W2> | Frm | -18.5 | -14.9 | -4.4 | -2.9 | - | - | - |
| <W2 | Frm | 3.1 | -4.4 | 15.1 | -13.5 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| AL | Frm | 1.7 | 2.4 | -1.7 | 2.4 | - | - | - |
| L | Frm | 8.6 | 20.6 | -8.6 | 20.6 | - | - | - |
| S | Frm | 1.1 | 2.6 | -1.1 | 2.6 | - | - | - |
| E> | Frm | -0.9 | -0.5 | -0.9 | 0.5 | - | - | - |
| EG+ | Frm | 0.1 | 0.3 | -0.1 | 0.3 | - | - | - |
| <E | Frm | 0.9 | 0.5 | 0.9 | -0.5 | - | - | - |
| EG- | Frm | -0.1 | -0.3 | 0.1 | -0.3 | - | - | - |
| WP | Frm | 0.8 | -16.4 | -2.5 | -15.5 | - | - | - |
| WB1> | Brc | - | - | - | - | - | - | - |
| <WB1 | Brc | - | - | - | - | - | - | - |
| WB2> | Brc | - | - | - | - | - | - | - |
| <WB2 | Brc | - | - | - | - | - | - | - |
| EB> | Brc | - | - | - | - | - | - | - |
| <EB | Brc | - | - | - | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 12-J | 17.1 | 13 | 14.6 | 17 | - | - | - | - | 19.4 | 11 | 32.7 | 1 | - | - | - | - |
| 67/0/0 | 12-B | 14.6 | 18 | 15.1 | 12 | - | - | - | - | 19.7 | 12 | 32.4 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 11.9 | 11.6 |
| AD | 0.0 | 0.0 | 0.9 | 0.8 |
| CG | 0.0 | 0.0 | 11.4 | 11.4 |
| L> | 0.0 | 0.0 | 41.3 | 41.3 |
| <L | 0.0 | 0.0 | 41.3 | 41.3 |
| S> | 0.0 | 0.0 | 5.2 | 5.2 |
| <S | 0.0 | 0.0 | 5.2 | 5.2 |
| US1* | 0.0 | 0.0 | 5.4 | 5.4 |
| *US1 | 0.0 | 0.0 | 3.4 | 3.4 |
| W1> | 20.1 | 20.1 | 35.9 | 35.9 |
| <W1 | 20.9 | 20.9 | 35.9 | 35.9 |
| W2> | 22.9 | 22.9 | 17.8 | 17.8 |
| <W2 | 18.2 | 18.2 | 17.8 | 17.8 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 5.0 | 4.8 |
| L | 0.0 | 0.0 | 41.3 | 41.3 |
| S | 0.0 | 0.0 | 5.2 | 5.2 |
| E> | 1.8 | 1.8 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.6 | 0.6 |
| <E | 1.8 | 1.8 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.6 | 0.6 |
| WP | 1.7 | 1.7 | 31.9 | 31.9 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.0 |
| EB> | 0.0 | 0.0 | 0.0 | 0.0 |
| <EB | 0.0 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 12-J | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 67/0/0 | 12-B | 6 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.71 | 40.373 | 215.32 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.26 | 36.217 | 193.16 | 1.25 | 45.27 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 0.04 | 27.500 | 204.46 | 1.00 | 27.50 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 2 | S1 | 2.33 | 27.500 | 204.46 | 1.00 | 27.50 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 3 | S1 | 5.77 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 1 | S1 | 13.77 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 2 | S1 | 17.20 | 27.500 | 204.46 | 1.50 | 41.25 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 4 | 3 | S1 | 19.75 | 27.500 | 204.46 | 1.00 | 27.50 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 1 | S1 | 2.08 | 29.770 | 158.77 | 1.00 | 29.77 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 2 | S1 | 7.14 | 35.894 | 191.44 | 1.75 | 62.81 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 5 | 3 | S1 | 9.95 | 39.296 | 209.58 | 1.25 | 49.12 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.71 | 40.373 | 215.32 | N/A | N/A | 0.3750 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Brackets Part Summary**

| Mem. No. | Loc. (ft) | Total Length (in.) | Bracket Cut (in.) | Bracket Depth (in.) | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Hole Pitch (in.) | Stiffener or Plate | Part |
|---|---|---|---|---|---|---|---|---|---|---|

**Brackets Design Summary (vertical live load is with the impact factor)**

| Mem. No. | Loc. (ft) | Vert. Live Load (k) | Vert. Dead Load (k) | Lateral Impact (k) | Longitudinal Impact (k) | CL Dist to Flange (in.) | Member Depth1 (in.) | Member Depth2 (in.) | Web Thk (in.) | Flg Thk (in.) | Flg Width (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Outside Flange Configuration ID | Desc. | Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Desc. | Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.375 | 6.00 | 33.14 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.56 |
| 4 | 1 | SP | 0.375 | 6.00 | 33.14 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 31 | Extended | 3.56 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.50 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - Out Design Proc. | Shear (k) | Moment (in-k) | Required Strength - In Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - In Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 17 | -8.3 | 12.5 | 2342.6 | Thin plate | 159.0 | 2628.8 | 11 | 10.9 | 14.4 | 2412.4 | Thin plate | 159.0 | 2628.8 |
| 2 | 1 | 17 | -8.3 | 12.5 | 2342.6 | Thin plate | 159.0 | 2628.8 | 11 | 10.9 | 14.4 | 2412.4 | Thin plate | 159.0 | 2628.8 |
| 3 | 2 | 11 | 10.9 | 0.7 | 150.2 | Thin plate | 106.0 | 579.7 | 37 | 1.6 | 1.5 | 748.3 | Thin plate | 159.0 | 988.4 |
| 4 | 1 | 11 | 10.9 | 0.7 | 150.2 | Thin plate | 106.0 | 579.7 | 37 | 1.6 | 1.5 | 748.3 | Thin plate | 159.0 | 988.4 |
| 5 | 2 | 18 | -18.2 | 15.5 | 2705.1 | Thin plate | 159.0 | 2613.5 | 12 | 13.8 | 13.5 | 2266.0 | Thin plate | 159.0 | 2613.5 |
| 6 | 2 | 18 | -18.2 | 15.5 | 2705.1 | Thin plate | 159.0 | 2613.5 | 12 | 13.8 | 13.5 | 2266.0 | Thin plate | 159.0 | 2613.5 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/8/12 | 30/1/13 | FB4100 | |
| 2 | 11/6/3 | 20/4/6 | FB4020 | |
| 3 | 9/7/2 | 10/5/4 | FB3054 | |
| 4 | 1/2/0 | 1/5/13 | FB3054 | |
| 4 | 16/2/0 | 16/5/13 | FB3054 | |
| 5 | 6/2/0 | 26/5/13 | FB4070 | |
| 5 | 10/4/11 | 30/8/9 | FB4104 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.4 | 1.1 | -25.8 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.13 | 0.06 |
| 10002 | 2.42 | 11.50 | 1 | 1 | 0.4 | -1.1 | -25.8 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.13 | 0.06 |
| 1 | 18.94 | 42.00 | 2 | 2 | -33.5 | -11.4 | -2596.3 | 0.0 | 124.5 | 13.0 | 4556.2 | 539.9 | 0.59 | 0.88 |
| 2 | 1.20 | 42.00 | 2 | 11 | -22.2 | -13.5 | -2559.7 | 0.0 | 217.9 | 12.8 | 4129.4 | 234.7 | 0.67 | 1.00 |
| 3 | 0.00 | 28.00 | 13 | 37 | 1.0 | 7.2 | 1014.9 | 0.0 | 221.1 | 10.3 | 1500.5 | 111.9 | 0.68 | 1.01 |
| 4 | 15.78 | 28.00 | 13 | 2 | -1.2 | -7.3 | -747.0 | 0.0 | 41.9 | 7.1 | 839.9 | 111.9 | 0.82 | 1.03 |
| 5 | 11.57 | 42.00 | 18 | 18 | -18.2 | -13.8 | -2705.1 | 0.0 | 217.9 | 21.0 | 4129.4 | 234.7 | 0.70 | 0.97 |
| 6 | 18.94 | 42.00 | 1 | 1 | -33.2 | 11.4 | -2604.6 | 0.0 | 124.5 | 13.0 | 4556.4 | 539.9 | 0.59 | 0.88 |

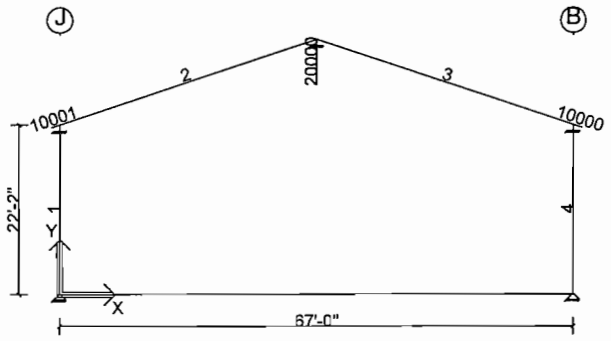
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 18.94 | 227.27 | 227.3 | 227.3 | 15.69 | 15.69 | 4521.56 | 42.69 | 215.31 | 10.67 | 244.80 | 16.36 | 0.76 | 18380.37 | 1.66 | 1.00 | 1.00 | 1.00 | 0.70 |
| 2 | 1.20 | 374.22 | 29.1 | 29.1 | 12.23 | 12.23 | 3045.98 | 13.52 | 145.05 | 4.51 | 173.42 | 7.11 | 0.30 | 5857.48 | 1.00 | 1.00 | 1.00 | 1.00 | 0.54 |
| 3 | 0.00 | 374.22 | 119.1 | 60.0 | 6.70 | 6.70 | 810.66 | 9.01 | 57.90 | 3.00 | 67.05 | 4.62 | 0.09 | 1733.72 | 1.48 | 1.00 | 1.00 | 0.84 | 1.00 |
| 4 | 15.78 | 374.23 | 180.0 | 180.0 | 6.70 | 6.70 | 810.66 | 9.01 | 57.90 | 3.00 | 67.05 | 4.62 | 0.09 | 1733.71 | 1.28 | 1.00 | 1.00 | 0.84 | 0.72 |
| 5 | 11.57 | 374.23 | 14.0 | 14.0 | 12.23 | 12.23 | 3045.98 | 13.52 | 145.05 | 4.51 | 173.42 | 7.11 | 0.30 | 5857.48 | 1.03 | 1.00 | 1.00 | 1.00 | 0.54 |
| 6 | 18.94 | 227.27 | 227.3 | 227.3 | 15.69 | 15.69 | 4521.56 | 42.69 | 215.31 | 10.67 | 244.80 | 16.36 | 0.76 | 18380.37 | 1.66 | 1.00 | 1.00 | 1.00 | 0.70 |

**User Defined Frame Point Loads for Cross Section: 12**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 3753.75 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 6494.58 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -4558.12 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1817.29 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -1042.71 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 12**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -103.26 | 0/0/0 | -103.26 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -595.83 | 0/0/0 | -595.83 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -595.83 | 0/0/0 | -595.83 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -595.83 | 0/0/0 | -595.83 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -74.48 | 0/0/0 | -74.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 576.56 | 0/0/0 | 576.56 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 450.44 | 0/0/0 | 450.44 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 306.29 | 0/0/0 | 306.29 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 180.17 | 0/0/0 | 180.17 | 9/11/3 | N | UP | 0.240 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |

| | | | | | | |
|---|---|---|---|---|---|---|
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 12**

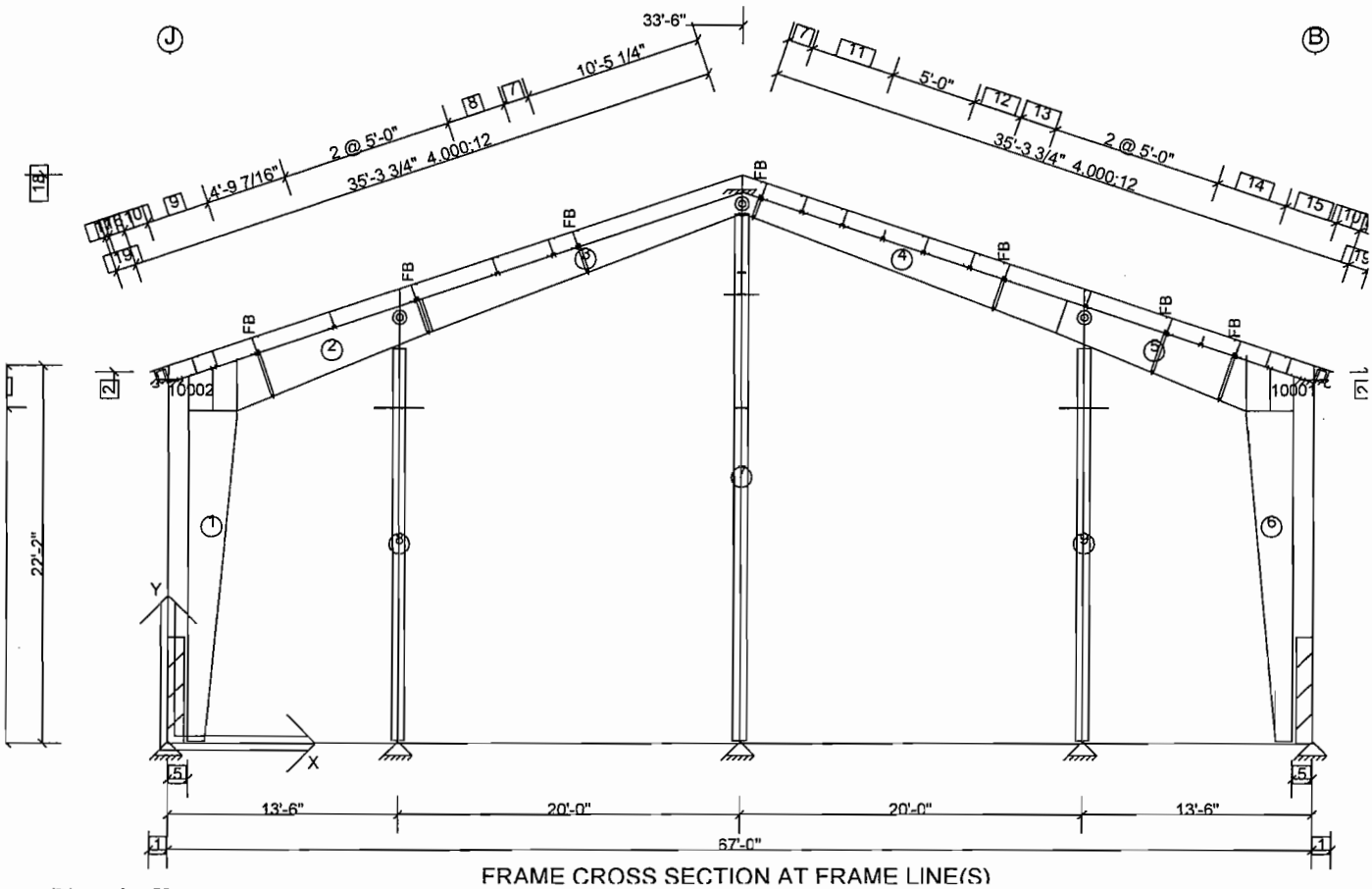
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/205 ) | 1.176 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1003 ) | -0.730 | 3 | 2 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Wall: 4, Frame at: 100/11/0

Frame Cross Section:




FRAME CROSS SECTION AT FRAME LINE(S)

**Dimension Key**

1 1'-1 1/2"
2 21'-9 1/2"
3 33'-5 3/4" BL to CL of Runway Beam
4 33'-6 1/4" BL to CL of Runway Beam
5 1'-2"
6 2'-5 3/4"
7 1'-5 13/16"
8 3'-5 5/16"
9 3'-8 3/4"
10 1'-5 3/16"
11 2 @ 2'-6"
12 2'-10 3/16"
13 2'-1 13/16"
14 4'-2 11/16"
15 3'-2"
16 11 1/4"
17 3"
18 33'-4" Ridge Ht.
19 1'-2 1/4" 4.000:12

**Frame Clearances**

Horiz. Clearance between members 1(CX208) and 6(CX209): 59'-0"

Vert. Clearance at member 1(CX208): 19'-3 3/16"
Vert. Clearance at member 6(CX209): 19'-3 3/16"
Vert. Clearance at member 7(EPX200): 31'-1 1/8"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 100/11/0 | 16/6/8 | CB1 EP | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL | D + AD + CG+AL |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL | D + AD + CG + S+AL |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL | D + AD + CG + W1>+AL |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 AL | D + AD + CG + <W1+AL |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL | D + AD + CG + W2>+AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 AL | D + AD + CG + <W2+AL |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL | D + AD + CG + WP+AL |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 36 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 37 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.62 | 34.4 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.3750 | 0.1644 | 12.00 | 34.00 | 21.42 | 777.6 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.3125 | 0.1644 | 34.00 | 24.00 | 14.37 | 336.7 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.2500 | 0.1345 | 24.00 | 14.00 | 19.71 | 341.6 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 5.00 | 0.2500 | 0.1345 | 14.00 | 24.00 | 20.00 | 346.5 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 5.00 | 0.3125 | 0.1644 | 24.00 | 34.00 | 14.08 | 330.7 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.3750 | 0.1644 | 12.00 | 34.00 | 21.42 | 779.8 | 55.00 | 55.00 | BP | KN | 3P |
| 7 | 10.00 | 0.3750 | 0.1644 | 17.00 | 17.00 | 30.97 | 1109.1 | 55.00 | 55.00 | BP | CP | 3P |
| 8 | 9.00 | 0.3125 | 0.1345 | 12.00 | 12.00 | 26.54 | 574.3 | 55.00 | 55.00 | BP | SS | 3P |
| 9 | 9.00 | 0.3125 | 0.1345 | 12.00 | 12.00 | 26.54 | 574.7 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 5239.9 (p) (Includes all plates)
Frame Pricing Weight = 5487.0 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 7 | No | Yes |
| 8 | No | Yes |
| 9 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 67/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 7 | 33/6/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 8 | 13/6/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 13/6/0 | 26/8/0 | Yes | No | No | 0/0/0 | 0/0/0 | 0.0000 |
| 9 | 53/6/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 53/6/0 | 26/8/0 | Yes | No | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 67/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/2/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 33/5/12 | 33/3/15 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Interior Column | | | Exterior Column | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 13/6/0 | | | 33/6/0 | | | 53/6/0 | | | 67/0/0 | |
| Grid1 - Grid2 | | -J | | 14-I | | | F-14 | | | C-14 | | | -B | |
| Base Plate W x L (in.) | | 9 x 13 | | 10 x 13 | | | 11 x 18 | | | 10 x 13 | | | 9 x 13 | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | | 0.375 | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | |
| Column Base Elev. | | 100'-1 1/2" | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | | | 100'-1 1/2" | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy |
| D | Frm | 0.5 | 2.7 | - | - | 0.7 | - | - | 3.1 | - | - | 0.7 | -0.5 | 2.7 |
| AD | Frm | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - |
| CG | Frm | 0.5 | 2.1 | - | - | - | - | - | 2.6 | - | - | - | -0.5 | 2.0 |
| L> | Frm | 1.8 | 7.8 | - | - | - | - | - | 8.8 | - | - | - | -1.8 | 7.8 |
| <L | Frm | 1.8 | 7.8 | - | - | - | - | - | 8.8 | - | - | - | -1.8 | 7.8 |
| S> | Frm | 0.2 | 1.0 | - | - | - | - | - | 1.1 | - | - | - | -0.2 | 1.0 |
| <S | Frm | 0.2 | 1.0 | - | - | - | - | - | 1.1 | - | - | - | -0.2 | 1.0 |
| US1* | Frm | 0.2 | 0.4 | - | - | - | - | - | 1.8 | - | - | - | -0.2 | 1.0 |
| *US1 | Frm | 0.1 | 0.9 | - | - | - | - | - | 0.7 | - | - | - | -0.1 | 0.3 |
| W1> | Frm | -7.0 | -10.4 | - | 5.7 | - | - | 7.9 | -6.9 | - | 5.7 | - | -3.9 | -4.3 |
| <W1 | Frm | 4.1 | -5.0 | - | -5.1 | - | - | -7.1 | -5.6 | - | -5.1 | - | 7.1 | -11.2 |
| W2> | Frm | -8.3 | -6.4 | - | - | - | - | - | -5.7 | - | - | - | -4.1 | 0.6 |
| <W2 | Frm | 2.8 | -1.0 | - | - | - | - | - | -4.4 | - | - | - | 6.9 | -6.3 |
| WP | Frm | 0.1 | -11.5 | - | - | - | - | - | -2.1 | - | - | - | -1.4 | -10.8 |
| CU | Frm | - | - | - | - | - | - | - | -- | - | - | - | - | - |
| AL | Frm | 0.0 | 0.0 | - | - | - | - | - | 4.7 | - | - | - | -0.0 | 0.0 |
| L | Frm | 1.8 | 7.8 | - | - | - | - | - | 8.8 | - | - | - | -1.8 | 7.8 |
| S | Frm | 0.2 | 1.0 | - | - | - | - | - | 1.1 | - | - | - | -0.2 | 1.0 |
| E> | Frm | -0.5 | -0.3 | - | 0.2 | - | - | 0.2 | - | - | 0.2 | - | -0.5 | 0.3 |
| EG+ | Frm | 0.0 | 0.1 | - | - | - | - | - | 0.1 | - | - | - | -0.0 | 0.1 |
| <E | Frm | 0.5 | 0.3 | - | -0.2 | - | - | -0.2 | - | - | -0.2 | - | 0.5 | -0.3 |
| EG- | Frm | -0.0 | -0.1 | - | - | - | - | - | -0.1 | - | - | - | 0.0 | -0.1 |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -J | 8.0 | 14 | 5.3 | 19 | - | - | - | - | 9.9 | 16 | 12.6 | 1 | - | - | - | - |
| 13/6/0 | 14-I | - | - | - | - | 5.1 | 8 | 5.7 | 7 | - | - | 0.7 | 1 | - | - | - | - |
| 13/6/0 | 26/8/0 | - | - | - | - | 4.7 | 8 | 5.3 | 7 | 0.7 | 1 | - | - | - | - | - | - |
| 33/6/0 | F-14 | - | - | - | - | 7.1 | 8 | 7.9 | 7 | 4.7 | 12 | 15.0 | 1 | - | - | - | - |
| 53/6/0 | C-14 | - | - | - | - | 5.1 | 8 | 5.7 | 7 | - | - | 0.7 | 1 | - | - | - | - |
| 53/6/0 | 26/8/0 | - | - | - | - | 4.8 | 8 | 5.3 | 7 | 0.7 | 1 | - | - | - | - | - | - |
| 67/0/0 | -B | 5.4 | 20 | 6.8 | 13 | - | - | - | - | 9.6 | 13 | 12.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.9 | 8.5 |
| AD | 0.0 | 0.0 | 0.4 | 0.4 |
| CG | 0.0 | 0.0 | 6.7 | 6.7 |
| L> | 0.0 | 0.0 | 24.4 | 24.4 |
| <L | 0.0 | 0.0 | 24.4 | 24.4 |
| S> | 0.0 | 0.0 | 3.1 | 3.1 |
| <S | 0.0 | 0.0 | 3.1 | 3.1 |
| US1* | 0.0 | 0.0 | 3.2 | 3.2 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 10.9 | 10.9 | 21.5 | 21.5 |
| <W1 | 11.2 | 11.2 | 21.8 | 21.8 |
| W2> | 12.4 | 12.4 | 11.4 | 11.4 |
| <W2 | 9.7 | 9.7 | 11.7 | 11.7 |
| WP | 1.3 | 1.3 | 24.4 | 24.4 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| AL | 0.0 | 0.0 | 5.0 | 4.8 |
| L | 0.0 | 0.0 | 24.4 | 24.4 |
| S | 0.0 | 0.0 | 3.1 | 3.1 |
| E> | 1.1 | 1.1 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.4 | 0.4 |
| <E | 1.1 | 1.1 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.4 | 0.4 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -J | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 13/6/0 | 14-I | 8 | 0.375 | 10 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 33/6/0 | F-14 | 7 | 0.375 | 11 | 18 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 53/6/0 | C-14 | 9 | 0.375 | 10 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 67/0/0 | -B | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 19.35 | 33.250 | N/A | N/A | N/A | 0.3125 | 3.500 | Both | F-FP,W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1875 | 0.1875 | 3.500 | Opposite Fillet | W-OS-0.1875 |
| 6 | 1 | S3 | 19.35 | 33.250 | N/A | N/A | N/A | 0.3125 | 3.500 | Both | F-FP,W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1875 | 0.1875 | 3.500 | Opposite Fillet | W-OS-0.1875 |

**Brackets Part Summary**

| Mem. No. | Loc. (ft) | Total Length (in.) | Bracket Cut (in.) | Bracket Depth (in.) | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Hole Pitch (in.) | Stiffener or Plate | Part |
|---|---|---|---|---|---|---|---|---|---|---|

**Brackets Design Summary (vertical live load is with the impact factor)**

| Mem. No. | Loc. (ft) | Vert. Live Load (k) | Vert. Dead Load (k) | Lateral Impact (k) | Longitudinal Impact (k) | CL Dist to Flange (in.) | Member Depth1 (in.) | Member Depth2 (in.) | Web Thk (in.) | Flg Thk (in.) | Flg Width (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 8.00 | 39.09 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 31 | Extended | 4.13 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 39.34 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 31 | Extended | 4.13 |
| 3 | 2 | SP | 0.375 | 6.00 | 17.53 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.63 | 12 | Flush (0) | 2.00 |
| 4 | 1 | SP | 0.375 | 6.00 | 17.53 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.63 | 12 | Flush (0) | 2.00 |
| 5 | 2 | KN(Face) | 0.375 | 6.00 | 41.96 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 4.06 | 31 | Extended | 4.06 |
| 6 | 2 | KN(Face) | 0.375 | 8.00 | 41.71 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 4.06 | 31 | Extended | 4.06 |
| 7 | 2 | CP | 0.375 | 6.00 | 18.00 | 0.500 | A325/ | 0.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 19 | -0.9 | 4.8 | 746.4 | Thin plate | 159.0 | 795.2 | 12 | 3.4 | 7.0 | 971.0 | Thin plate | 159.0 | 1076.4 |
| 2 | 1 | 19 | -0.9 | 4.8 | 746.4 | Thin plate | 159.0 | 795.2 | 12 | 3.4 | 7.0 | 971.0 | Thin plate | 159.0 | 1076.4 |
| 3 | 2 | 1 | -0.3 | 7.3 | 390.7 | Thin plate | 159.0 | 426.5 | 16 | 10.2 | 1.7 | 222.8 | Thin plate | 159.0 | 304.6 |
| 4 | 1 | 1 | -0.3 | 7.3 | 390.7 | Thin plate | 159.0 | 426.5 | 16 | 10.2 | 1.7 | 222.8 | Thin plate | 159.0 | 304.6 |
| 5 | 2 | 20 | -6.4 | 6.8 | 985.4 | Thin plate | 159.0 | 1035.3 | 13 | 5.7 | 7.0 | 986.7 | Thin plate | 159.0 | 1077.9 |
| 6 | 2 | 20 | -6.4 | 6.8 | 985.4 | Thin plate | 159.0 | 1035.3 | 13 | 5.7 | 7.0 | 986.7 | Thin plate | 159.0 | 1077.9 |
| 7 | 2 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0 | | 0.0 | 0.0 | | 0.0 | 0.0 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/3/3 | 30/1/13 | FB4044 | |
| 2 | 11/0/10 | 20/4/6 | FB3024 | |
| 3 | 9/7/2 | 10/5/4 | FB2104 | |
| 4 | 1/2/0 | 1/5/13 | FB2074 | |
| 4 | 16/2/0 | 16/5/13 | FB3010 | |
| 5 | 6/2/0 | 26/5/13 | FB4024 | |
| 5 | 10/4/11 | 30/8/9 | FB4050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.42 | 11.50 | 1 | 1 | 0.2 | 0.7 | -15.6 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.08 | 0.04 |
| 10002 | 2.42 | 11.50 | 1 | 1 | 0.2 | -0.7 | -15.6 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.08 | 0.04 |
| 1 | 12.93 | 26.67 | 14 | 16 | 5.0 | 5.4 | 844.6 | 0.0 | 338.6 | 13.9 | 1855.0 | 338.9 | 0.46 | 0.50 |
| 2 | 12.98 | 24.27 | 13 | 2 | 5.0 | 7.9 | -506.0 | 0.0 | 218.1 | 15.2 | 1003.4 | 134.2 | 0.52 | 0.74 |
| 3 | 0.00 | 24.00 | 13 | 1 | 5.0 | -7.3 | -501.9 | 0.0 | 186.8 | 8.3 | 889.8 | 95.5 | 0.58 | 0.50 |
| 4 | 15.98 | 22.06 | 14 | 2 | -2.2 | 7.2 | -446.7 | 0.0 | 24.2 | 9.1 | 512.5 | 95.3 | 0.85 | 0.49 |
| 5 | 0.00 | 24.00 | 12 | 1 | 2.6 | -7.8 | -489.8 | 0.0 | 229.9 | 15.4 | 953.7 | 134.1 | 0.52 | 0.73 |
| 6 | 19.40 | 34.00 | 13 | 16 | 9.7 | -4.2 | 1007.6 | 0.0 | 368.5 | 10.8 | 2532.9 | 340.1 | 0.41 | 0.39 |
| 7 | 15.35 | 17.00 | 7 | 12 | 0.6 | -7.9 | -745.7 | 0.0 | 335.7 | 22.5 | 900.8 | 425.6 | 0.83 | 0.35 |
| 8 | 13.27 | 12.00 | 7 | 7 | -0.7 | -5.7 | -448.4 | 0.0 | 56.4 | 17.8 | 473.3 | 269.0 | 0.91 | 0.32 |
| 9 | 13.27 | 12.00 | 7 | 7 | -0.7 | -5.7 | -448.9 | 0.0 | 56.4 | 17.8 | 473.3 | 269.0 | 0.91 | 0.32 |

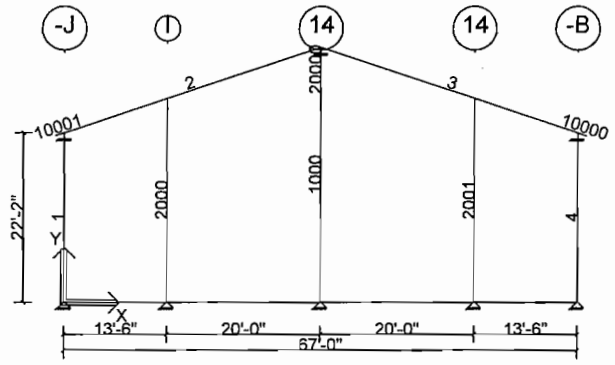
| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.42 | 28.99 | 29.0 | 29.0 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 12.93 | 232.80 | 232.8 | 232.8 | 10.26 | 10.26 | 1275.43 | 32.01 | 95.66 | 8.00 | 106.48 | 12.18 | 0.32 | 5531.67 | 1.36 | 1.00 | 1.00 | 0.90 | 1.00 |
| 2 | 12.98 | 382.30 | 117.5 | 117.5 | 7.01 | 7.01 | 629.56 | 6.52 | 51.88 | 2.61 | 60.41 | 4.07 | 0.14 | 935.47 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |
| 3 | 0.00 | 382.30 | 119.2 | 119.2 | 5.66 | 5.66 | 498.01 | 5.21 | 41.50 | 2.09 | 48.26 | 3.23 | 0.07 | 735.13 | 1.17 | 1.00 | 1.00 | 0.94 | 1.00 |
| 4 | 15.98 | 382.31 | 180.0 | 180.0 | 5.40 | 5.40 | 409.84 | 5.21 | 37.15 | 2.09 | 42.91 | 3.22 | 0.07 | 620.15 | 1.70 | 1.00 | 1.00 | 0.94 | 0.82 |
| 5 | 0.00 | 382.31 | 120.1 | 120.1 | 6.97 | 6.97 | 613.36 | 6.52 | 51.11 | 2.61 | 59.47 | 4.06 | 0.14 | 914.46 | 1.02 | 1.00 | 1.00 | 1.00 | 1.00 |
| 6 | 19.40 | 232.80 | 232.8 | 232.8 | 11.47 | 11.47 | 2199.64 | 32.01 | 129.39 | 8.00 | 146.31 | 12.22 | 0.33 | 9048.60 | 1.48 | 1.00 | 1.00 | 0.90 | 1.00 |
| 7 | 15.35 | 379.05 | 368.4 | 368.4 | 10.17 | 10.17 | 577.11 | 62.51 | 67.89 | 12.50 | 73.20 | 18.86 | 0.38 | 4319.02 | 1.13 | 1.00 | 1.06 | 0.82 | 1.00 |
| 8 | 13.27 | 318.50 | 318.5 | 318.5 | 7.15 | 7.15 | 208.63 | 37.97 | 34.77 | 8.44 | 37.22 | 12.71 | 0.19 | 1296.69 | 1.00 | 1.00 | 1.07 | 0.80 | 0.99 |
| 9 | 13.27 | 318.50 | 318.5 | 318.5 | 7.15 | 7.15 | 208.63 | 37.97 | 34.77 | 8.44 | 37.22 | 12.71 | 0.19 | 1296.69 | 1.00 | 1.00 | 1.07 | 0.80 | 0.99 |

**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2005.83 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 3470.40 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -2435.65 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -971.07 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -580.77 | 9/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -57.51 | 0/0/0 | -57.51 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -331.87 | 0/0/0 | -331.87 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -331.87 | 0/0/0 | -331.87 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -331.87 | 0/0/0 | -331.87 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -41.48 | 0/0/0 | -41.48 | 9/11/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 321.13 | 0/0/0 | 321.13 | 9/11/3 | N | UP | 0.768 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 250.88 | 0/0/0 | 250.88 | 9/11/3 | N | UP | 0.600 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 170.60 | 0/0/0 | 170.60 | 9/11/3 | N | UP | 0.408 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 100.35 | 0/0/0 | 100.35 | 9/11/3 | N | UP | 0.240 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 12 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 15 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 16 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/204 ) | 1.198 | 1 | 2 | 12 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/945 ) | 0.392 | 2 | 2 | 6 | <W1 |
| Max. Vertical Deflection for Span 2 | ( L/880 ) | 0.421 | 5 | 1 | 7 | W2> |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Vertical Frame Clearances Wall: 4**

| Frame | Required | at Bottom of Beam Left | Left Bracket Length | at Bottom of Beam Right | Right Bracket Length | Hoist Room | Clear Lift |
|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 3/7/5 | 2/3/10 | 3/7/5 | 2/3/10 | 2/7/2 | 23/8/14 |
| 2 | 0/0/0 | 4/4/13 | 3/1/2 | 4/4/13 | 3/1/2 | 2/7/2 | 23/8/14 |
| 3 | 0/0/0 | 3/6/4 | 2/2/9 | 3/6/4 | 2/2/9 | 2/7/2 | 23/8/14 |
| 4 | 0/0/0 | 3/6/4 | 2/2/9 | 3/6/4 | 2/2/9 | 2/7/2 | 23/8/14 |
| 5 | 0/0/0 | 4/9/0 | 3/5/5 | 4/9/0 | 3/5/5 | 2/7/2 | 23/8/14 |

**Horizontal Frame Clearances Wall: 4**

| Frame | Required | at Bottom of Beam Left | at Bottom of Beam Right |
|---|---|---|---|
| 1 | 1/0/0 | 0/0/0 | 0/0/0 |
| 2 | 1/0/0 | 0/0/0 | 0/0/0 |
| 3 | 1/0/0 | 0/0/0 | 0/0/0 |
| 4 | 1/0/0 | 0/0/0 | 0/0/0 |
| 5 | 1/0/0 | 0/0/0 | 0/0/0 |

THIS INFO IS MEANINGLESS, IT REFERS TO A CRANE SYSTEM WHICH IS UNDEFINED BEYOND CAPACITY/LOADING.

**Loads and Codes - Shape: Clerestory Frames**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.575)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 4/9/8
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 21.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

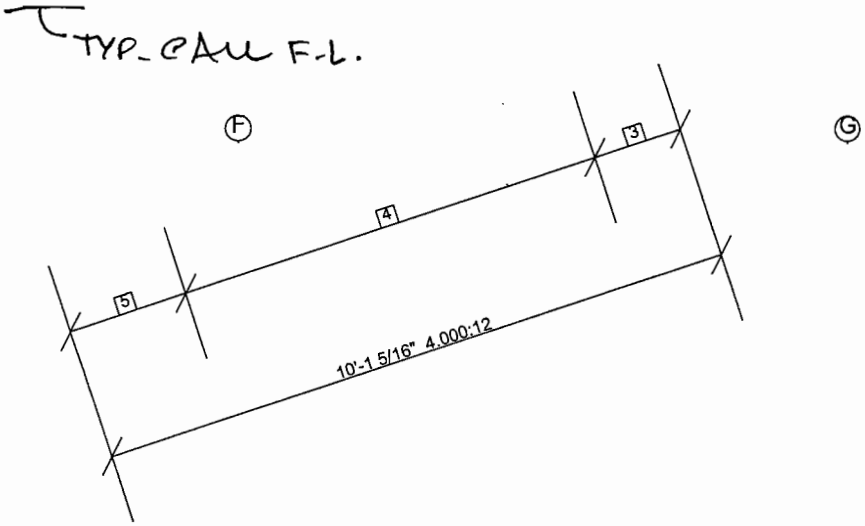
**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.0981
Bracing Seismic Period: 0.0648
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

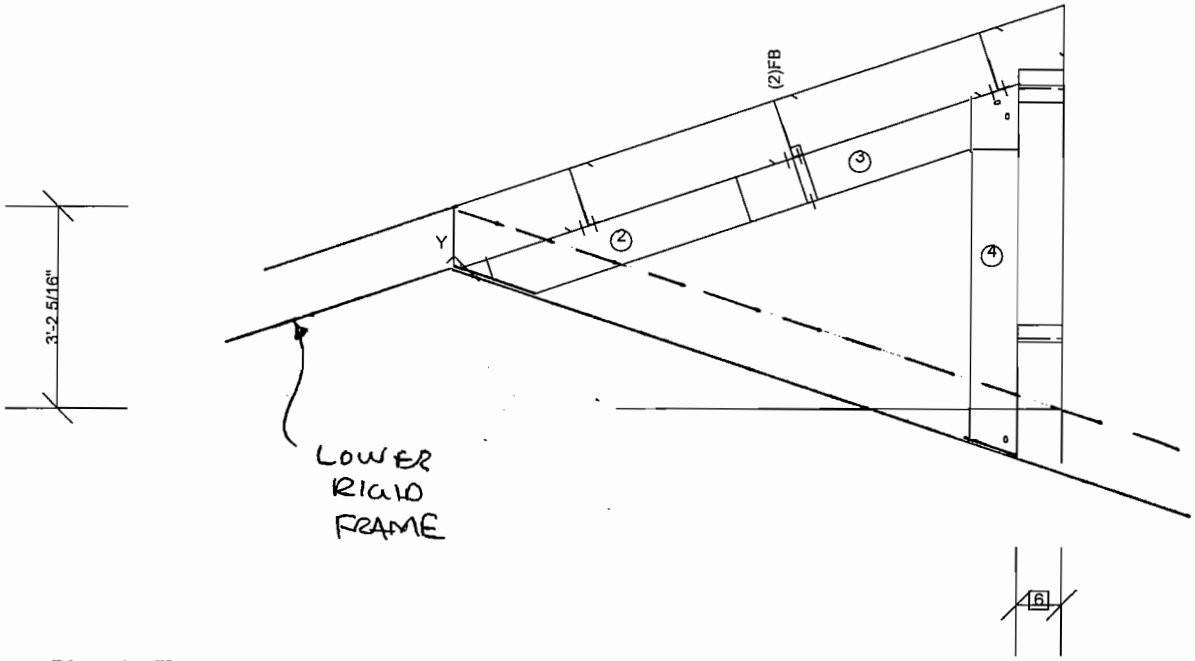
**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Underhung Crane
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Wall: 2, Frame at: 61/4/0**

Frame Cross Section: 11




**Dimension Key**

1 1'-7 9/16"
2 1'-6 3/4"
3 1'-4 13/16"
4 2 @ 3'-4 3/4"
5 1'-10 15/16"
6 8 1/2"
7 1'-3 15/16"
8 3'-6 1/4"
9 6 3/16"
10 1'-0 5/16"

**Frame Clearances**

Horiz. Clearance between members 1(CX215) and 4(CX216): 7'-4 3/8"
Vert. Clearance at member 1(CX215): 1'-7 1/4"
Vert. Clearance at member 4(CX216): 4'-0 3/4"
Finished Floor Elevation = 133'-4" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 61/4/0 | 30/0/0 | Clerestory RF | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~1~~ | ~~5.00~~ | ~~0.1345~~ | ~~0.1345~~ | ~~9.00~~ | ~~9.00~~ | ~~2.18~~ | ~~33.0~~ | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.68 | 41.6 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.68 | 38.6 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 6.15 | 66.1 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 179.2 (p) (Includes all plates)
Frame Pricing Weight = 213.2 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 9/7/1 | -1/0/2 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 11**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 9/7/1 | | | | | |
| Grid1 - Grid2 | | 11-F | | | 11-G | | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | | 8 x 10 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 133'-4" | | | 132'-3 7/8" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 0.1 | - | 0.6 | -0.1 | - | 0.8 | - | - | - |
| CG | Frm | 0.1 | - | 0.6 | -0.1 | - | 0.8 | - | - | - |
| L> | Frm | 0.5 | - | 2.6 | -0.5 | - | 3.2 | - | - | - |
| <L | Frm | 0.5 | - | 2.6 | -0.5 | - | 3.2 | - | - | - |
| S> | Frm | 0.1 | - | 0.3 | -0.1 | - | 0.4 | - | - | - |
| <S | Frm | 0.1 | - | 0.3 | -0.1 | - | 0.4 | - | - | - |
| W1> | Frm | 3.2 | - | 0.1 | 1.4 | - | -4.3 | - | - | - |
| <W1 | Frm | -1.3 | - | -2.8 | -0.1 | - | -3.4 | - | - | - |
| W2> | Frm | 3.1 | - | 1.1 | 1.5 | - | -3.1 | - | - | - |
| <W2 | Frm | -1.4 | - | -1.8 | 0.0 | - | -2.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 0.5 | - | 2.6 | -0.5 | - | 3.2 | - | - | - |
| S | Frm | 0.1 | - | 0.3 | -0.1 | - | 0.4 | - | - | - |
| E> | Frm | 0.1 | - | 0.1 | 0.0 | - | -0.1 | - | - | - |
| EG+ | Frm | - | - | 0.0 | - | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | - | -0.1 | -0.0 | - | 0.1 | - | - | - |
| EG- | Frm | - | - | -0.0 | - | - | -0.0 | - | - | - |
| WP | Frm | 0.0 | - | -1.9 | -0.4 | - | -1.7 | - | - | - |
| WB1> | Brc | - | 0.3 | -0.0 | - | 0.3 | -0.1 | - | - | - |
| <WB1 | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| WB2> | Brc | - | 0.3 | -0.0 | - | 0.3 | -0.1 | - | - | - |
| <WB2 | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| EB> | Brc | - | 0.2 | -0.0 | - | 0.2 | -0.1 | - | - | - |
| <EB | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 11-F | 1.3 | 12 | 3.4 | 5 | - | - | 0.3 | 35 | 2.4 | 10 | 4.0 | 15 | - | - | - | - |
| 9/7/1 | 11-G | 0.9 | 29 | 1.5 | 11 | - | - | 0.3 | 35 | 3.8 | 9 | 4.8 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.4 | 1.4 |
| CG | 0.0 | 0.0 | 1.4 | 1.4 |
| L> | 0.0 | 0.0 | 5.8 | 5.8 |
| <L | 0.0 | 0.0 | 5.8 | 5.8 |
| S> | 0.0 | 0.0 | 0.7 | 0.7 |
| <S | 0.0 | 0.0 | 0.7 | 0.7 |
| W1> | 4.6 | 4.6 | 4.2 | 4.2 |
| <W1 | 1.4 | 1.4 | 6.2 | 6.2 |
| W2> | 4.6 | 4.6 | 2.0 | 2.0 |
| <W2 | 1.4 | 1.4 | 4.0 | 4.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 5.8 | 5.8 |
| S | 0.0 | 0.0 | 0.7 | 0.7 |

| | | | | |
|---|---|---|---|---|
| E> | 0.2 | 0.2 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.2 | 0.2 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |
| WP | 0.3 | 0.3 | 3.7 | 3.7 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.1 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.1 |
| EB> | 0.0 | 0.0 | 0.0 | 0.1 |
| <EB | 0.0 | 0.0 | 0.0 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 11-F | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 9/7/1 | 11-G | 4 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 1.37 | 8.675 | 64.50 | N/A | N/A | 0.1875 | 2.000 | Both | W-OS-0.1875 |
| 4 | 1 | S3 | 5.08 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.36 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.61 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 5 | -2.5 | 0.5 | 72.9 | Thin plate | 106.0 | 140.1 | 10 | 1.0 | 2.1 | 17.0 | Thin plate | 106.0 | 140.1 |
| 2 | 1 | 5 | -2.5 | 0.5 | 72.9 | Thin plate | 106.0 | 140.1 | 10 | 1.0 | 2.1 | 17.0 | Thin plate | 106.0 | 140.1 |
| 3 | 2 | 1 | 0.4 | 3.4 | 35.2 | Thin plate | 106.0 | 143.6 | 9 | -1.9 | 2.7 | 46.8 | Thin plate | 106.0 | 149.8 |
| 4 | 2 | 1 | 0.4 | 3.4 | 35.2 | Thin plate | 106.0 | 143.6 | 9 | -1.9 | 2.7 | 46.8 | Thin plate | 106.0 | 149.8 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 3 | 0/11/6 | 4/9/9 | (2)FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| ~~1~~ | ~~1.64~~ | ~~9.00~~ | ~~7~~ | ~~5~~ | ~~-2.4~~ | ~~-3.4~~ | ~~-63.2~~ | ~~0.0~~ | ~~49.1~~ | ~~20.9~~ | ~~169.5~~ | ~~39.0~~ | ~~0.40~~ | ~~0.16~~ |
| 2 | 0.27 | 9.00 | 5 | 2 | -2.5 | 2.8 | -72.9 | 0.0 | 48.0 | 20.9 | 169.5 | 39.0 | 0.46 | 0.14 |
| 3 | 0.00 | 9.00 | 1 | 1 | -0.6 | -3.4 | 49.7 | 0.0 | 48.0 | 20.9 | 169.5 | 39.0 | 0.30 | 0.16 |
| 4 | 5.11 | 9.00 | 9 | 32 | 3.8 | -1.6 | 52.1 | 0.0 | 76.4 | 20.9 | 169.5 | 39.0 | 0.33 | 0.08 |

| Mem. | Loc. | Lx | Ly/Lt | Lb | Ag | Afn | Ixx | Iyy | Sx | Sy | Zx | Zy | J | Cw | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ft | in. | in. | in. | in.2 | in.2 | in.4 | in.4 | in.3 | in.3 | in.3 | in.3 | in.4 | in.6 | | | | | |
| 1 | 1.64 | 19.72 | 19.7 | 19.7 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.65 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.27 | 93.35 | 6.5 | 6.5 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.89 |
| 3 | 0.00 | 93.35 | 61.0 | 61.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.16 | 1.00 | 1.13 | 0.67 | 0.89 |
| 4 | 5.11 | 61.37 | 61.4 | 61.4 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.34 | 1.00 | 1.13 | 0.67 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 100 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 100 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 100 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 100 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 100 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 100 | 0 | 0.600 E> + 0.600 EG- | E> + EG- |
| 14 | System | 1.000 | 100 | 0 | 0.600 <E + 0.600 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 11**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/417 ) | -0.055 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/2699 ) | 0.036 | 3 | 1 | 3 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Covering - Expanded Report

### Shape: Maintenance Area

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.685)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 27/9/0
Parts / Portions Zone Strip Width: 6/8/6
Basic Wind Pressure: 25.20,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3340
Bracing Seismic Period: 0.2043
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Unreinforced Masonry Wall

WALL PANELS FOR THIS BUILDING ARE MOSTLY ATTACHED TO BLOCK VIA SECONDARY BY OTHERS & NOT VP. PANEL LOAD CHART FOLLOWS PG# 141, IT SHOULD BE USED TO DETERMINE THE MAXIMUM SPACING OF THAT SECONDARY.

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Covering Design Loads - Wall: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 0/0/0 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 48.000 | 0.63 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 14/3/10 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 14/3/10 | 48.000 | 0.63 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 6/8/6 | 39.000 | 0.85 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 6/8/6 | 48.000 | 0.63 | IN | 1.180 |

**Covering Design Loads - Wall: 2**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 0/0/0 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 48.000 | 0.63 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 95/11/10 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 95/11/10 | 48.000 | 0.63 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 6/8/6 | 39.000 | 0.85 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 6/8/6 | 48.000 | 0.63 | IN | 1.180 |

**Covering Design Loads - Wall: 3**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 0/0/0 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 48.000 | 0.63 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 60/3/10 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 60/3/10 | 48.000 | 0.63 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 6/8/6 | 39.000 | 0.85 | OUT | -1.280 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 6/8/6 | 48.000 | 0.63 | IN | 1.180 |

**Covering Design Loads - Wall: 4**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 0/0/0 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 48.000 | 0.63 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower and Upper Girt | 40.71 | 95/11/10 | 41.000 | 0.99 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 95/11/10 | 48.000 | 0.63 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 6/8/6 | 39.000 | 0.85 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 6/8/6 | 48.000 | 0.63 | IN | 1.180 |

**Covering Design Loads - Roof: A**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -21/0/0 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 2.50 | -21/0/0 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 2.50 | -21/0/0 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 14.03 | -21/0/0 | 86.000 | 0.16 | IN | 1.000 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | -7/6/1 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -7/6/1 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | -6/8/6 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -6/8/6 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | -6/8/6 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -6/8/6 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 0/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | -6/8/6 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -6/8/6 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | -6/8/6 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -6/8/6 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 0/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | -15/11/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -15/11/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 95/11/10 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 95/11/10 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 102/8/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 102/8/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 102/8/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 102/8/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 102/8/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 102/8/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 102/8/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 97/1/2 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 97/1/2 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 6/8/6 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 6/8/6 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 6/8/6 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 6/8/6 | 86.000 | 0.22 | IN | 0.680 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 26.02 | 0/0/8 | 57.000 | 0.46 | OUT | -1.080 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/8 | 86.000 | 0.22 | IN | 0.680 |

**Covering Design Loads - Roof: B**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -1/1/8 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 2.50 | -1/1/8 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 2.50 | -1/1/8 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 14.08 | -1/1/8 | 86.000 | 0.16 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 5/6/14 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 5/6/14 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | -1/1/8 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -1/1/8 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 0/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 0/0/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 0/0/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 5/6/14 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 5/6/14 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 110/2/1 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 110/2/1 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 110/2/1 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 110/2/1 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 109/2/2 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 109/2/2 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 109/2/2 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 109/2/2 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 103/9/8 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 103/9/8 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 102/8/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 102/8/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 102/8/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 102/8/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 102/8/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 102/8/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 102/8/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 102/8/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 102/8/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 97/1/2 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 97/1/2 | 86.000 | 0.22 | IN | 0.680 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 26.02 | 102/8/0 | 57.000 | 0.46 | OUT | -1.080 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 19.32 | 102/8/0 | 86.000 | 0.22 | IN | 0.680 |
| Interior Area in Extension | psf | W1> | Standard Spacing is Adequate | 21.39 | 102/8/0 | 57.000 | 0.38 | OUT | -0.900 |
| Interior Area in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 86.000 | 0.17 | IN | 0.500 |

**Covering Design Loads - Wall: 2 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.34 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 5.34 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 0/0/0 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 98/2/10 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 98/2/10 | 74.000 | 0.20 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 54.88 | 6/8/6 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 6/8/6 | 74.000 | 0.20 | IN | 0.500 |

**Covering Design Loads - Wall: 4 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 0/0/0 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 54.88 | 6/8/6 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 6/8/6 | 74.000 | 0.20 | IN | 0.500 |

**Panel Data**

22 GA FP12 BY VP/ON HATS/ON BLOCK

| Wall/Roof | Type | Thickness | Finish | Color | Direction | Gable Dir | Max. Length |
|---|---|---|---|---|---|---|---|
| Wall: 1 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Not Applicable | Peak Out | 41/0/0 |
| Location: 2 | Open | | Exposed to wind | | | | |
| Location: 3 | Open | | Exposed to wind | | | | |
| Wall: 2 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Location: 3 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 4 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 5 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 6 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 7 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 8 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Canopy: 1 | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Wall: 3 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Location: 3 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 4 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 5 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 6 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 7 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Wall: 4 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Location: 3 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 4 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 5 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 6 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 7 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Location: 8 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Canopy: 2 | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Roof: A | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Roof: B | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |

**Abbreviation Definitions**

| Codes | Definition |
|---|---|
| LE | From Left Edge |
| RE | From Right Edge |
| FL | From Frame |
| FS | From Start Dim |

**Location Data**

| Wall/Roof | Start Dim. | Bottom Elev. | Top Elev. | End Dim. | Bottom Elev. | Top Elev. | First Pitch | Second Pitch | Ridge Distance | Ridge Height | psf |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wall: 1 Location: 2 | 0/0/0 LE | 0/0/0 | 15/11/6 | 21/0/0 FS | 0/0/0 | 22/11/5 | | | | | |
| Wall: 1 Location: 3 | 21/0/0 LE | 0/0/0 | 0/0/0 | 0/0/0 RE | 0/0/0 | 0/0/0 | | | | | |
| Wall: 2 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |
| Wall: 2 Location: 3 | 4/0/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 2 Location: 4 | 18/0/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 2 Location: 5 | 41/0/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 2 Location: 6 | 64/0/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 2 Location: 7 | 78/0/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |

## FLUSH PANEL - Allowable Wind Load vs. Span (psf)

ANY (1) SPAN OR (2) SPAN PANELS

| Panel Designation: | Pressure Direction | Simple Span Condition-Maximum Span | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2.0 ft. | 2.5 ft. | 3.0 ft. | 3.5 ft. | 4.0 ft. | 4.5 ft | 5.0 ft. |
| FP12 –24 Ga. Steel [1] | Inward | 99 | 60 | 35 | 22 | 15 | 10 | 8 |
| | Outward | 29 | 29 | 29 | 29 | 29 | 23 | 18 |
| FP12 –22 Ga. Steel [1] | Inward | 155 | 88 | 51 | 32 | 21 | 15 | 11 |
| | Outward | 45 | 45 | 45 | 45 | 45 | 35 | 27 |
| FP12 –.032 Al. [1] | Inward | 67 | 34 | 20 | 12 | 8 | 6 | 4 |
| | Outward | 18 | 18 | 18 | 18 | 18 | 14 | 10 |

*Allowable loads **do not** include a 4/3 stress increase for wind load cases.*

**Table Notes:**
1. ASTM E-72, Ting (9/91)

3 SPAN & MORE PANELS

| Panel Designation: | Pressure Direction | 3 Span Condition – Maximum Span | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2.0 ft. | 2.5 ft. | 3.0 ft. | 3.5 ft. | 4.0 ft. | 4.5 ft | 5.0 ft. |
| FP12 –24 Ga. Steel [1] | Inward | 143 | 92 | 64 | 47 | 36 | 28 | 21 |
| | Outward | 29 | 29 | 29 | 29 | 29 | 28 | 22 |
| FP12 –22 Ga. Steel [1] | Inward | 223 | 143 | 99 | 73 | 56 | 40 | 29 |
| | Outward | 45 | 45 | 45 | 45 | 45 | 38 | 31 |
| FP12 –.032 Al. [1] | Inward | 116 | 74 | 52 | 33 | 22 | 16 | 11 |
| | Outward | 18 | 18 | 18 | 18 | 18 | 18 | 16 |

*Allowable loads **do not** include a 4/3 stress increase for wind load cases.*

**Table Notes:**
1. ASTM E-72, Ting (9/91)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wall: 2 Location: 8 | 92/6/0 LE | 0/0/0 | 7/0/0 | 3/4/0 FS | 0/0/0 | 7/0/0 | | | | | 1.00 |
| Wall: 3 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |
| Wall: 3 Location: 3 | 2/8/0 LE | 0/0/0 | 7/0/0 | 3/4/0 FS | 0/0/0 | 7/0/0 | | | | | 1.00 |
| Wall: 3 Location: 4 | 6/0/0 LE | 15/5/0 | 19/5/0 | 3/0/0 FS | 15/5/0 | 19/5/0 | | | | | 1.00 |
| Wall: 3 Location: 5 | 26/6/0 LE | 15/5/0 | 19/5/0 | 3/0/0 FS | 15/5/0 | 19/5/0 | | | | | 1.00 |
| Wall: 3 Location: 6 | 32/1/2 LE | 24/0/4 | 26/10/0 | 2/9/12 FS | 24/0/4 | 26/10/0 | | | | | 1.00 |
| Wall: 3 Location: 7 | 61/0/0 LE | 0/0/0 | 7/0/0 | 3/4/0 FS | 0/0/0 | 7/0/0 | | | | | 1.00 |
| Wall: 4 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |
| Wall: 4 Location: 3 | 2/0/0 LE | 0/0/0 | 8/0/0 | 8/0/0 FS | 0/0/0 | 8/0/0 | | | | | 1.00 |
| Wall: 4 Location: 4 | 14/8/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 4 Location: 5 | 28/6/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 4 Location: 6 | 49/8/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 4 Location: 7 | 72/8/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |
| Wall: 4 Location: 8 | 86/8/0 LE | 0/0/0 | 16/0/0 | 12/0/0 FS | 0/0/0 | 16/0/0 | | | | | 1.00 |

**Fastener Data**

| Wall/Roof | Type | Length | Spacing | Washers | Insul. Block | Mod. Ctrl. | Ice Damming |
|---|---|---|---|---|---|---|---|
| Wall: 1 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Wall: 2 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Location: 4 | Not Applicable | | | | | | |
| Location: 5 | Not Applicable | | | | | | |
| Location: 6 | Not Applicable | | | | | | |
| Location: 7 | Not Applicable | | | | | | |
| Location: 8 | Not Applicable | | | | | | |
| Canopy: 1 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Wall: 3 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Location: 4 | Not Applicable | | | | | | |
| Location: 5 | Not Applicable | | | | | | |
| Location: 6 | Not Applicable | | | | | | |
| Location: 7 | Not Applicable | | | | | | |
| Wall: 4 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Location: 3 | Not Applicable | | | | | | |
| Location: 4 | Not Applicable | | | | | | |
| Location: 5 | Not Applicable | | | | | | |
| Location: 6 | Not Applicable | | | | | | |
| Location: 7 | Not Applicable | | | | | | |
| Location: 8 | Not Applicable | | | | | | |
| Canopy: 2 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Roof: A | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Roof: B | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |

## Shape: Clerestory Frames

**Loads and Codes - Shape: Clerestory Frames**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.575)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.0981

Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 4/9/8
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 21.13,(Parts) 25.76 psf

% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

Bracing Seismic Period: 0.0648
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Underhung Crane
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Covering Design Loads - Wall: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 0/0/0 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 66.000 | 0.46 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 6/7/1 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 6/7/1 | 66.000 | 0.46 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 3/0/0 | 56.000 | 0.59 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 3/0/0 | 66.000 | 0.46 | IN | 1.180 |

**Covering Design Loads - Wall: 2**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 0/0/0 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 66.000 | 0.46 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 99/8/0 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 99/8/0 | 66.000 | 0.46 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 3/0/0 | 56.000 | 0.59 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 3/0/0 | 66.000 | 0.46 | IN | 1.180 |

**Covering Design Loads - Wall: 3**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 0/0/0 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 66.000 | 0.46 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 6/7/1 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 6/7/1 | 66.000 | 0.46 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 3/0/0 | 56.000 | 0.59 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 3/0/0 | 66.000 | 0.46 | IN | 1.180 |

**Covering Design Loads - Wall: 4**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 0/0/0 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 0/0/0 | 66.000 | 0.46 | IN | 1.180 |
| End Zone | psf | W1> | Need Lower Girt | 40.71 | 99/8/0 | 56.000 | 0.73 | OUT | -1.580 |
| End Zone | psf | <W2 | Need Lower Girt | 30.40 | 99/8/0 | 66.000 | 0.46 | IN | 1.180 |
| Interior Area | psf | W1> | Need Lower Girt | 32.98 | 3/0/0 | 56.000 | 0.59 | OUT | -1.280 |
| Interior Area | psf | <W2 | Need Lower Girt | 30.40 | 3/0/0 | 66.000 | 0.46 | IN | 1.180 |

**Covering Design Loads - Roof: A**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -1/1/8 | 91.000 | 0.24 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 4.30 | -1/1/8 | 91.000 | 0.05 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 77.55 | 0/0/0 | 80.000 | 0.97 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 0/0/0 | 91.000 | 0.18 | IN | 0.580 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 0/0/0 | 99.000 | 0.94 | OUT | -3.700 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 91.000 | 0.16 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 0/0/0 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 0/0/0 | 91.000 | 0.18 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 91.000 | 0.16 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 100/9/8 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 100/9/8 | 91.000 | 0.18 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 102/8/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 91.000 | 0.16 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 77.55 | 102/8/0 | 80.000 | 0.97 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 102/8/0 | 91.000 | 0.18 | IN | 0.580 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 102/8/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 91.000 | 0.16 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 0/0/0 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 0/0/0 | 91.000 | 0.18 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 91.000 | 0.16 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 100/9/8 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 100/9/8 | 91.000 | 0.18 | IN | 0.580 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 102/8/0 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 102/8/0 | 91.000 | 0.18 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 102/8/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 102/8/0 | 91.000 | 0.16 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 44.06 | 10/10/8 | 57.000 | 0.77 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 16.74 | 10/10/8 | 91.000 | 0.18 | IN | 0.580 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 36.33 | 1/10/8 | 57.000 | 0.64 | OUT | -1.480 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 16.74 | 1/10/8 | 91.000 | 0.18 | IN | 0.580 |

**Panel Data**

| Wall/Roof | Type | Thickness | Finish | Color | Direction | Gable Dir | Max. Length |
|---|---|---|---|---|---|---|---|
| ~~Wall: 1~~ | ~~Panel Rib~~ | ~~26~~ | ~~KXL~~ | ~~Standard Color~~ | ~~Left to Right~~ | ~~Left to Right~~ | ~~41/0/0~~ |
| ~~Wall: 2~~ | ~~Panel Rib~~ | ~~26~~ | ~~KXL~~ | ~~Standard Color~~ | ~~Left to Right~~ | ~~Left to Right~~ | ~~41/0/0~~ |
| Wall: 3 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Wall: 4 | ~~Panel Rib~~ | ~~26~~ | KXL | Standard Color | Left to Right | Left to Right | 41/0/0 |
| Location: 2 | NBVP - Panel | 1/16" | | Supported by others=no | | | |
| Roof: A | SLR2 | 22 | AEP | Standard Color | System Generated | Not Applicable | 40/0/0 |

22 GA FP12

**Abbreviation Definitions**

| Codes | Definition |
|---|---|
| LE | From Left Edge |
| RE | From Right Edge |
| FL | From Frame |
| FS | From Start Dim |

**Location Data**

| Wall/Roof | Start Dim. | Bottom Elev. | Top Elev. | End Dim. | Bottom Elev. | Top Elev. | First Pitch | Second Pitch | Ridge Distance | Ridge Height | psf |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wall: 4 Location: 2 | 2/6/0 LE | 1/4/0 | 4/10/2 | 97/8/0 FS | 1/4/0 | 4/10/2 | | | | | 1.00 |

**Fastener Data**

| Wall/Roof | Type | Length | Spacing | Washers | Insul. Block | Mod. Ctrl. | Ice Damming |
|---|---|---|---|---|---|---|---|
| Wall: 1 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Wall: 2 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Wall: 3 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Wall: 4 | Color Match Carbon | Standard Option | Standard Option | No | None | No | No |
| Location: 2 | Not Applicable | | | | | | |
| Roof: A | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |

# *Underwriters Laboratory UL-90 Letter*



**Underwriters Laboratory UL-90 Letter**

Contact:
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

The goods listed herein are purchased subject to the VP BUILDINGS terms and conditions of sale and the limitations contained therein.

**Roof Covering**

| Shape | Location | Type | Thickness | Spacing |
|---|---|---|---|---|
| Maintenance Area | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Wall: 4,Canopy: 4 | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Roof: A | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Roof: B | SLR2 | 22 | UL90 Uplift |
| Clerestory Shape | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Clerestory Shape | Wall: 8,Canopy: 8 | SLR2 | 22 | UL90 Uplift |
| Clerestory Shape | Roof: A | SLR2 | 22 | UL90 Uplift |
| Clerestory Shape | Roof: C | SLR2 | 22 | UL90 Uplift |
| Clerestory Frames | Roof: A | SLR2 | 22 | UL90 Uplift |

**SLR2 Roof UL-90 Certification**

This is to certify that the VP Buildings SLR SYSTEM, when installed in accordance with VP Buildings Basic Erection Guide and Standard Erection Details (SEDs), will meet Underwriters Laboratories UL Class 90 Uplift Rating. The SLR system has been tested and is listed under Underwriters Laboratories Construction No. 90.

VP BUILDINGS, Inc.
3200 Players Club Circle, Memphis TN 38125-8843

By: _____

STATE OF LOUISIANA
STEPHEN L. CARR
REG. No. 24811
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

STEPHEN L. CARR
REGISTERED PROFESSIONAL
PE. 11895
ENGINEER
STATE OF MISSISSIPPI

Project Name: Stennis Rivering
Contract: N69450-05-D-C09C
Bren Proj.: 3013-76
Submittal: 13125-13
Reviewed
Reviewed by: J. Collins
Date: 2/17/09

Dammon # 1



# VP Buildings

3200 Players Club Circle
Memphis, TN 38125-8843

# STRUCTURAL DESIGN DATA

Project: Riverine and Combatant Craft Operations Facility
Name: 0500 08 1318MW Rev 12908
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County: Hancock
Country: United States

BROADMOOR, L.L.C.

I hereby agree that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract number 62467-05-D-0096, is in compliance with the contract documents, will be installed in the allocated spaces, and is submitted for Government approval.

Engineer Date

Date

**TABLE OF CONTENTS**

**PRELIMINARY**

**FOR APPROVAL ONLY**

2442

## Letter of Certification

Contact:
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

This is to certify that the above referenced VP BUILDINGS project has been designed for the applicable portions of the following Building Code and in accordance with the order documents which have stipulated the following applied environmental loads and conditions:

**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Operations Building | 58/0/0 | 120/2/0 | 6970 | 7141 | 8048 | 24/9/8 | 24/9/8 | 5.000:12 | 5.000:12 | 36/10/8 |
| Operations Building Lean-to | 27/10/0 | 58/0/0 | 1614 | 1339 | 1847 | 22/3/0 | 12/11/11 | 4.000:12 | | |
| Maintenance Area | 67/0/0 | 102/8/0 | 6879 | 5981 | 7681 | 19/10/0 | 19/10/0 | 4.000:12 | 4.000:12 | 31/0/0 |
| Boat Storage Building | 47/0/0 | 182/0/0 | 8554 | 9525 | 10005 | 19/9/8 | 19/9/8 | 5.000:12 | 5.000:12 | 29/7/0 |
| Total For All Shapes | | | 26863 | 25004 | 30641 | | | | | |

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.706)
Parts Wind Exposure Factor: 0.706

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/5/0
Parts / Portions Zone Strip Width: 12/4/0
Basic Wind Pressure: 25.97 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3653
Bracing Seismic Period: 0.2222
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Operations Building : Mezzanine 1 @ 12/9/0**

| Floor Type | Non-Composite | Loading Type | Office |
|---|---|---|---|
| Top of Floor | 12/9/0 | Floor Dead Load | 50.00 psf |
| Total Thickness of Deck + Topping | 0/0/0 | Floor Live Load | 100.00 psf Not Reducible |
| Top of Joist | 0/0/0 | Collateral Load | 10.00 psf |
| Min. Clearance from Floor to Joist | 0/0/0 | Partition Load: | 10.00 psf |
| Min. Clearance from Floor to Rafter | 0/0/0 | Floor Live Load Deflection | 360 |
| Mezzanine Category | Entire Floor | Floor Dead + Floor Live Deflection | 240 |
| Bracing Category | Unbraced | | |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.602)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 8/9/11
Parts / Portions Zone Strip Width: 7/0/9
Basic Wind Pressure: 22.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2778
Bracing Seismic Period: 0.1719
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.668)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 25/5/0
Parts / Portions Zone Strip Width: 10/2/0
Basic Wind Pressure: 24.57,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3055
Bracing Seismic Period: 0.1880
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Crane Schedule Information**

| Name | Type | Service Classification | Method of Operation | Capacity (Ton) | Bridge Span | Bridge Construction |
|---|---|---|---|---|---|---|
| 2 Ton Underhung Bridge Crane | Underhung Crane | C (Moderate Service) | Pendant Operated | 2.00 | 35/0/0 | Single Girder |

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes - Shape: Boat Storage Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.663)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 12/4/2
Parts / Portions Zone Strip Width: 4/8/6
Basic Wind Pressure: 24.37,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3050
Bracing Seismic Period: 0.1877
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

The steel design is in accordance with VP BUILDINGS standard design practices, which have been established based upon pertinent procedures and recommendations of the following organizations:

American Institute of Steel Construction (AISC)
American Iron and Steel Institute (AISI)
American Welding Society (AWS)
American Society for Testing and Materials (ASTM)
Canadian Standards Association
CSA W59-Welded Steel Construction
Limit State Design of Steel Structures
Metal Building Manufacturers Association (MBMA)
VP Buildings is certified by:
- CSA A660 Certified (Design and Manufacturing)
- IAS Approved Fabricator
- Canadian Welding Bureau Div. 1 Certified

VP Buildings has designed the structural steel components of this building in accordance with the Building Code, Steel Specifications, and Standards indicated above. Steel components are designed utilizing the following steel grades unless noted otherwise:

3 Plate members fabricated from plate, bar, strip steel or sheets
ASTM A529, A572, A1011 - All Grade 55 ksi
Hot Rolled Shapes (W, S, C, Angles, etc)
ASTM A36, or ASTM A36Mod50, A529, A572, A588, A709, A992-All Grade 50 ksi
Tube and Pipe Sections ASTM A500, Grade B (Fy - 42 ksi pipe, Fy - 46 ksi tube)
Light Gage Sections ASTM A1011 SS Grade 55 ksi, A653 SS Grade 60 ksi
Round Rod Bracing ASTM A572 Grade 50 ksi

This certification DOES NOT apply to the design of the foundation or other on-site structures or components not supplied by VP BUILDINGS, nor does it apply to unauthorized modifications to framing systems provided by VP BUILDINGS.

Furthermore, it is understood that certification is based upon the premise that all components furnished by VP BUILDINGS will be erected or constructed in strict compliance with pertinent documents furnished by VP BUILDINGS.




Sincerely,

_____ P.E. Prepared by: _____ Reviewed by: SLC

VP BUILDINGS
3200 Players Club Circle, Memphis TN 38125-8843

## Reactions - Expanded Report

### Shape: Operations Building

Builder Contact: Mr. Roy Mouledous
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State Zip: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State Zip: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

**Loads and Codes - Shape: Operations Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**

Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**

Live Load: 20.00 psf Not Reducible

**Wind Load**

Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.706)
Parts Wind Exposure Factor: 0.706

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 15/5/0
Parts / Portions Zone Strip Width: 12/4/0
Basic Wind Pressure: 25.97 psf

**Snow Load**

Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**

Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3653
Bracing Seismic Period: 0.2222
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Load Type Descriptions**

| | | | |
|---|---|---|---|
| D | Material Dead Weight | C | Collateral Load |
| CG | Collateral Load for Gravity Cases | CU | Collateral Load for Wind Cases |
| L | Live Load | ASL^ | Alternate Span Live Load, Shifted Right |
| ^ASL | Alternate Span Live Load, Shifted Left | PL2 | Partial Live, Full, 2 Spans |
| L> | Live - Notional Right | <L | Live - Notional Left |
| S | Snow Load | US1* | Unbalanced Snow Load 1, Shifted Right |
| *US1 | Unbalanced Snow Load 1, Shifted Left | US2* | Unbalanced Snow Load 2, Shifted Right |
| *US2 | Unbalanced Snow Load 2, Shifted Left | SD | Snow Drift Load |
| SS | Sliding Snow Load | RS | Rain Surcharge Load |
| PF1 | Partial Load, Full, 1 Span | PH1 | Partial Load, Half, 1 Span |
| PF2 | Partial Load, Full, 2 Spans | PH2 | Partial Load, Half, 2 Spans |
| S> | Snow - Notional Right | <S | Snow - Notional Left |
| MRS | Minimum Roof Snow | MRS> | Minimum Roof Snow - Notional Right |
| <MRS | Minimum Roof Snow - Notional Left | W | Wind Load |
| W1> | Wind Load, Case 1, Right | <W1 | Wind Load, Case 1, Left |
| W2> | Wind Load, Case 2, Right | <W2 | Wind Load, Case 2, Left |
| W3> | Wind Load, Case 3, Right | <W3 | Wind Load, Case 3, Left |
| W4> | Wind Load, Case 4, Right | <W4 | Wind Load, Case 4, Left |
| W5> | Wind Load, Case 5, Right | <W5 | Wind Load, Case 5, Left |
| W6> | Wind Load, Case 6, Right | <W6 | Wind Load, Case 6, Left |
| WP | Wind Load, Parallel to Ridge | WPR | Wind Load, \|\| Ridge, Right |
| WPL | Wind Load, \|\| Ridge, Left | WPA1 | Wind Parallel - Ref A, Case 1 |
| WPA2 | Wind Parallel - Ref A, Case 2 | WPB1 | Wind Parallel - Ref B, Case 1 |
| WPB2 | Wind Parallel - Ref B, Case 2 | WPC1 | Wind Parallel - Ref C, Case 1 |

| | |
|---|---|
| WPC2 | Wind Parallel - Ref C, Case 2 |
| WPD2 | Wind Parallel - Ref D, Case 2 |
| <WB1 | Wind Brace Reaction, Case 1, Left |
| <WB2 | Wind Brace Reaction, Case 2, Left |
| <WB3 | Wind Brace Reaction, Case 3, Left |
| <WB4 | Wind Brace Reaction, Case 4, Left |
| <WB5 | Wind Brace Reaction, Case 5, Left |
| <WB6 | Wind Brace Reaction, Case 6, Left |
| MWB | Minimum Wind Bracing Reaction |
| E> | Seismic Load, Right |
| EG | Vertical Seismic Effect |
| EG- | Vertical Seismic Effect, Subtractive |
| <EB | Seismic Brace Reaction, Left |
| FL* | Alternate Span Floor Live Load, Shifted Right |
| FD | Floor Dead Load |
| AL*> | Auxiliary Live Load, Right, Right |
| <AL* | Auxiliary Live Load, Left, Right |
| AL* | Aux Live, Right |
| AL*>(1) | Auxiliary Live Load, Right, Right, Aisle 1 |
| <AL*(1) | Auxiliary Live Load, Left, Right, Aisle 1 |
| AL*(1) | Aux Live, Right, Aisle 1 |
| AL*>(2) | Auxiliary Live Load, Right, Right, Aisle 2 |
| <AL*(2) | Auxiliary Live Load, Left, Right, Aisle 2 |
| AL*(2) | Aux Live, Right, Aisle 2 |
| AL*>(3) | Auxiliary Live Load, Right, Right, Aisle 3 |
| <AL*(3) | Auxiliary Live Load, Left, Right, Aisle 3 |
| AL*(3) | Aux Live, Right, Aisle 3 |
| AL*>(4) | Auxiliary Live Load, Right, Right, Aisle 4 |
| <AL*(4) | Auxiliary Live Load, Left, Right, Aisle 4 |
| AL*(4) | Aux Live, Right, Aisle 4 |
| AL*>(5) | Auxiliary Live Load, Right, Right, Aisle 5 |
| <AL*(5) | Auxiliary Live Load, Left, Right, Aisle 5 |
| AL*(5) | Aux Live, Right, Aisle 5 |
| ALB | Aux Live Bracing Reaction |
| <ALB | Aux Live Bracing Reaction, Left |
| <WALB | Wind, Aux Live Bracing Reaction, Left |
| <ALB(1) | Aux Live Bracing Reaction, Left, Aisle 1 |
| <WALB(1) | Wind, Aux Live Bracing Reaction, Left, Aisle 1 |
| <ALB(2) | Aux Live Bracing Reaction, Left, Aisle 2 |
| <WALB(2) | Wind, Aux Live Bracing Reaction, Left, Aisle 2 |
| <ALB(3) | Aux Live Bracing Reaction, Left, Aisle 3 |
| <WALB(3) | Wind, Aux Live Bracing Reaction, Left, Aisle 3 |
| <ALB(4) | Aux Live Bracing Reaction, Left, Aisle 4 |
| <WALB(4) | Wind, Aux Live Bracing Reaction, Left, Aisle 4 |
| <ALB(5) | Aux Live Bracing Reaction, Left, Aisle 5 |
| <WALB(5) | Wind, Aux Live Bracing Reaction, Left, Aisle 5 |
| AD | Auxiliary Dead Load |
| U1 | User Defined Load - 1 |
| U3 | User Defined Load - 3 |
| U5 | User Defined Load - 5 |
| U7 | User Defined Load - 7 |
| U9 | User Defined Load - 9 |
| UB1 | User Brace Reaction - 1 |
| UB3 | User Brace Reaction - 3 |
| UB5 | User Brace Reaction - 5 |
| UB7 | User Brace Reaction - 7 |
| UB9 | User Brace Reaction - 9 |
| T | Temperature Load |

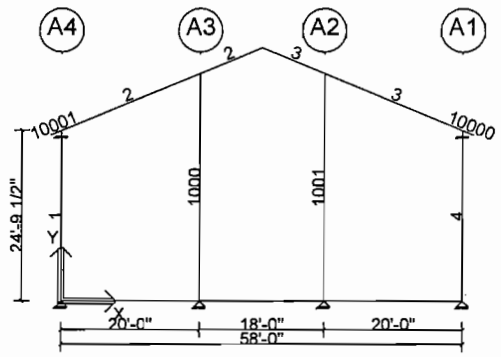
| | |
|---|---|
| WPD1 | Wind Parallel - Ref D, Case 1 |
| WB1> | Wind Brace Reaction, Case 1, Right |
| WB2> | Wind Brace Reaction, Case 2, Right |
| WB3> | Wind Brace Reaction, Case 3, Right |
| WB4> | Wind Brace Reaction, Case 4, Right |
| WB5> | Wind Brace Reaction, Case 5, Right |
| WB6> | Wind Brace Reaction, Case 6, Right |
| MW | Minimum Wind Load |
| E | Seismic Load |
| <E | Seismic Load, Left |
| EG+ | Vertical Seismic Effect, Additive |
| EB> | Seismic Brace Reaction, Right |
| FL | Floor Live Load |
| *FL | Alternate Span Floor Live Load, Shifted Left |
| AL | Auxiliary Live Load |
| *AL> | Auxiliary Live Load, Right, Left |
| <*AL | Auxiliary Live Load, Left, Left |
| *AL | Aux Live, Left |
| *AL>(1) | Auxiliary Live Load, Right, Left, Aisle 1 |
| <*AL(1) | Auxiliary Live Load, Left, Left, Aisle 1 |
| *AL(1) | Aux Live, Left, Aisle 1 |
| *AL>(2) | Auxiliary Live Load, Right, Left, Aisle 2 |
| <*AL(2) | Auxiliary Live Load, Left, Left, Aisle 2 |
| *AL(2) | Aux Live, Left, Aisle 2 |
| *AL>(3) | Auxiliary Live Load, Right, Left, Aisle 3 |
| <*AL(3) | Auxiliary Live Load, Left, Left, Aisle 3 |
| *AL(3) | Aux Live, Left, Aisle 3 |
| *AL>(4) | Auxiliary Live Load, Right, Left, Aisle 4 |
| <*AL(4) | Auxiliary Live Load, Left, Left, Aisle 4 |
| *AL(4) | Aux Live, Left, Aisle 4 |
| *AL>(5) | Auxiliary Live Load, Right, Left, Aisle 5 |
| <*AL(5) | Auxiliary Live Load, Left, Left, Aisle 5 |
| *AL(5) | Aux Live, Left, Aisle 5 |
| ALB> | Aux Live Bracing Reaction, Right |
| WALB> | Wind, Aux Live Bracing Reaction, Right |
| ALB>(1) | Aux Live Bracing Reaction, Right, Aisle 1 |
| WALB>(1) | Wind, Aux Live Bracing Reaction, Right, Aisle 1 |
| ALB>(2) | Aux Live Bracing Reaction, Right, Aisle 2 |
| WALB>(2) | Wind, Aux Live Bracing Reaction, Right, Aisle 2 |
| ALB>(3) | Aux Live Bracing Reaction, Right, Aisle 3 |
| WALB>(3) | Wind, Aux Live Bracing Reaction, Right, Aisle 3 |
| ALB>(4) | Aux Live Bracing Reaction, Right, Aisle 4 |
| WALB>(4) | Wind, Aux Live Bracing Reaction, Right, Aisle 4 |
| ALB>(5) | Aux Live Bracing Reaction, Right, Aisle 5 |
| WALB>(5) | Wind, Aux Live Bracing Reaction, Right, Aisle 5 |
| WALB | Wind, Aux Live Bracing Reaction |
| U0 | User Defined Load |
| U2 | User Defined Load - 2 |
| U4 | User Defined Load - 4 |
| U6 | User Defined Load - 6 |
| U8 | User Defined Load - 8 |
| UB | User Brace Reaction |
| UB2 | User Brace Reaction - 2 |
| UB4 | User Brace Reaction - 4 |
| UB6 | User Brace Reaction - 6 |
| UB8 | User Brace Reaction - 8 |
| R | Rain Load |
| V | Shear |

**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Operations Building | 58/0/0 | 120/2/0 | 6970 | 7141 | 8048 | 24/9/8 | 24/9/8 | 5.000:12 | 5.000:12 | 36/10/8 |
| Operations Building Lean-to | 27/10/0 | 58/0/0 | 1614 | 1339 | 1847 | 22/3/0 | 12/11/11 | 4.000:12 | | |
| Maintenance Area | 67/0/0 | 102/8/0 | 6879 | 5981 | 7681 | 19/10/0 | 19/10/0 | 4.000:12 | 4.000:12 | 31/0/0 |
| Boat Storage Building | 47/0/0 | 182/0/0 | 8554 | 9525 | 10005 | 19/9/8 | 19/9/8 | 5.000:12 | 5.000:12 | 29/7/0 |
| Total For All Shapes | | | 26863 | 25004 | 30641 | | | | | |

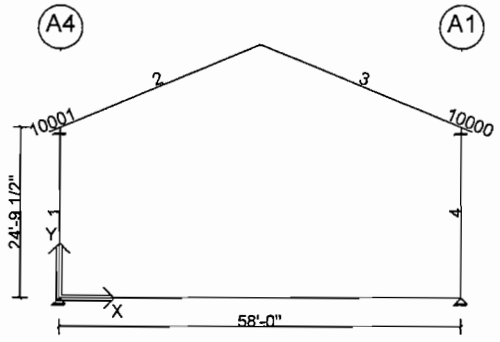
**User Defined Frame Point Loads for Cross Section: AM**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz MW | -13.75 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz MW | -7.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FL | Mezz MW | -13.75 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz MW | -7.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1000 | k | FL | Mezz MW | -26.13 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1000 | k | FD | Mezz MW | -14.25 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1001 | k | FL | Mezz MW | -26.13 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1001 | k | FD | Mezz MW | -14.25 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |



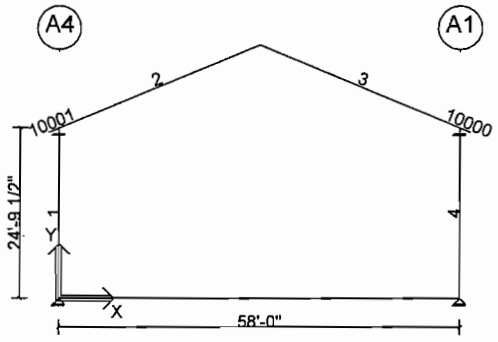
**User Defined Frame Point Loads for Cross Section: AL**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |



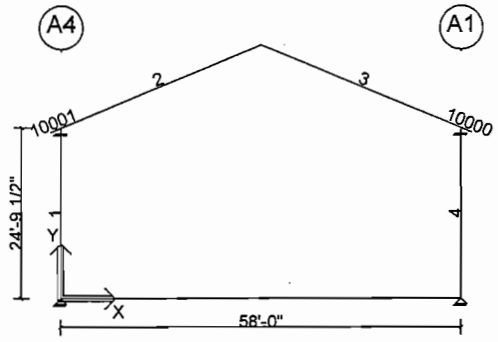
**User Defined Frame Point Loads for Cross Section: AK**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |



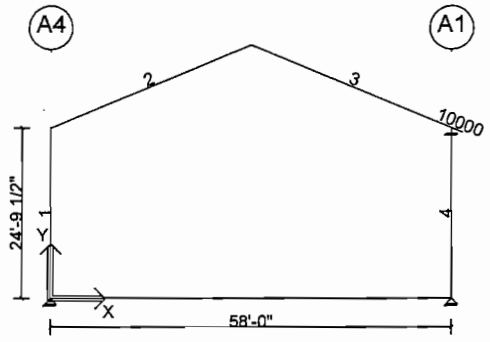
**User Defined Frame Point Loads for Cross Section: AJ**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |



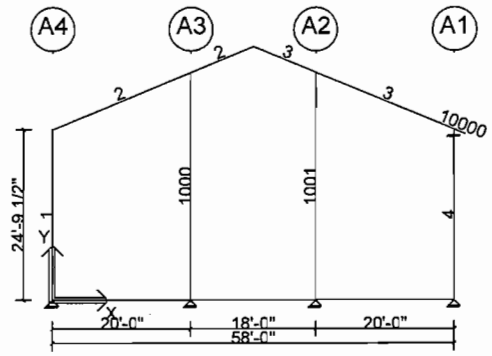
**User Defined Frame Point Loads for Cross Section: AF**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |



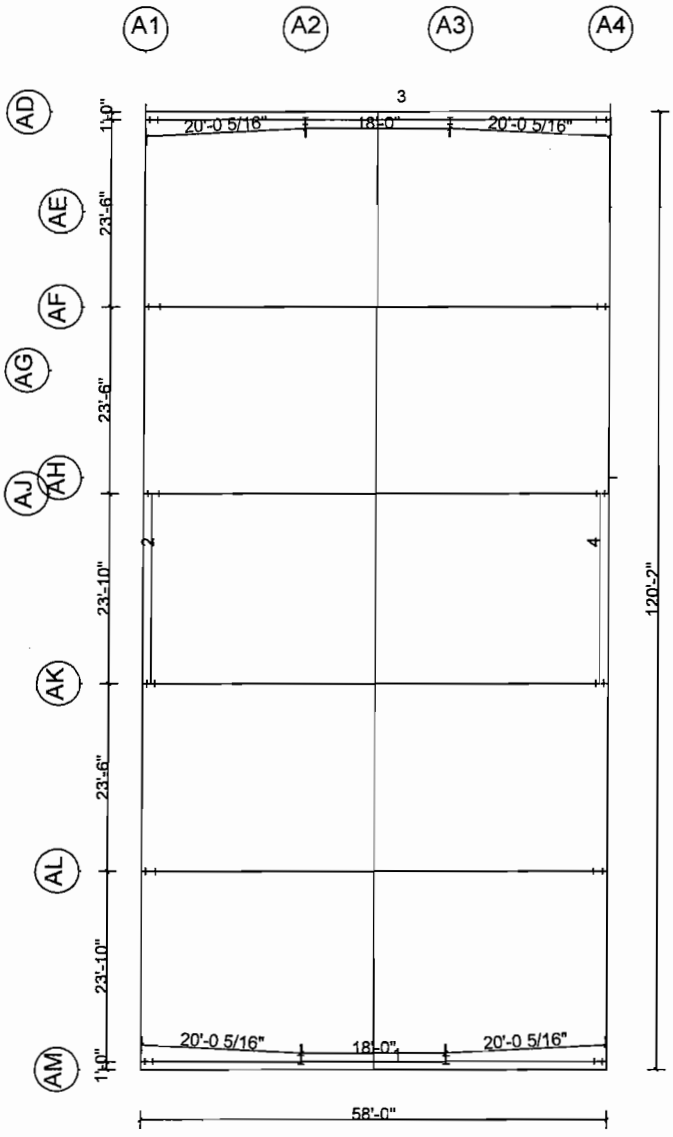
**User Defined Frame Point Loads for Cross Section: AD**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 1 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 1 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |
| 4 | k | FL | Mezz MW | -27.50 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | FD | Mezz MW | -15.00 | 12/0/0 | NA | NA | N | DOWN | 1.000 | CL |
| 4 | k | E> | MW | -0.63 | 12/0/0 | NA | NA | N | LEFT | 1.000 | CL |
| 4 | k | <E | MW | 0.63 | 12/0/0 | NA | NA | N | RIGHT | 1.000 | CL |

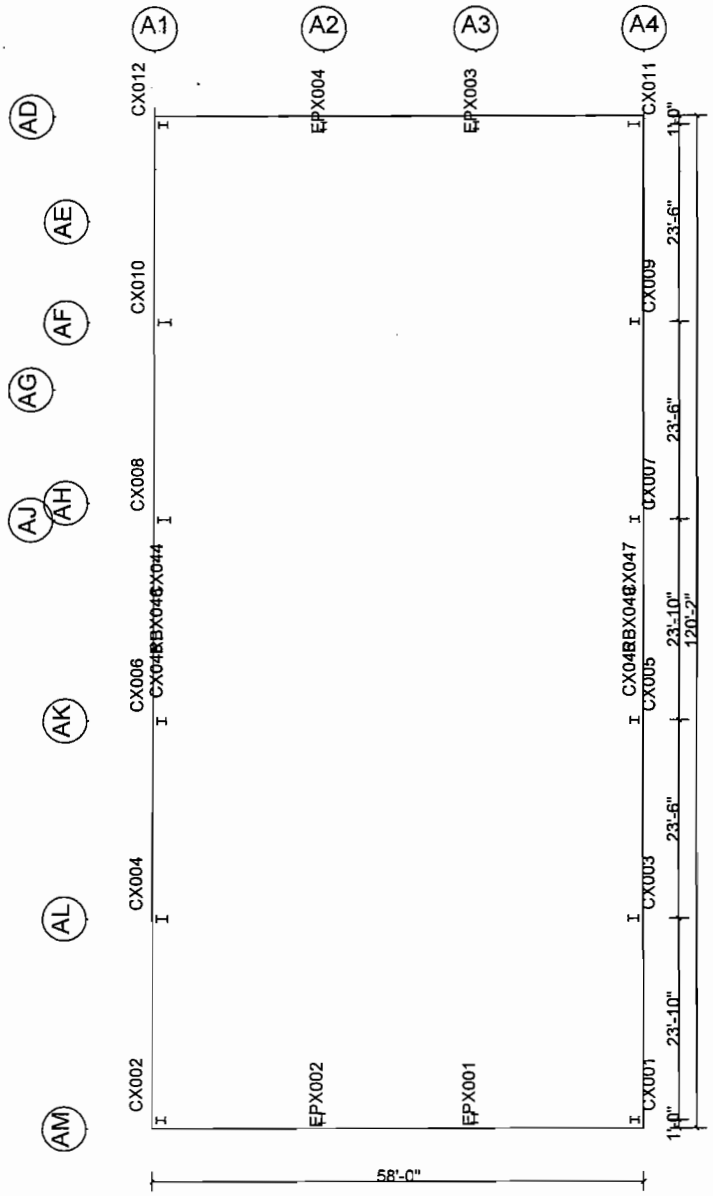



**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | A1- | A1-AM | 58/0/0 | 120/2/0 | 24/9/8 | 24/9/8 | 5.000:12 | 5.000:12 | 29/0/0 | 36/10/8 |


A1
A2
A3
A4
AD
AE
AF
AG
AH
AJ
AK
AL
AM
1'-0"
23'-6"
23'-6"
23'-10"
23'-6"
23'-10"
1'-0"
3
20'-0 5/16"
18'-0"
20'-0 5/16"
2
4
120'-2"
20'-0 5/16"
18'-0"
20'-0 5/16"
58'-0"

**Operations Building : Mezzanine 1 @ 12/9/0**



## Wall: 2

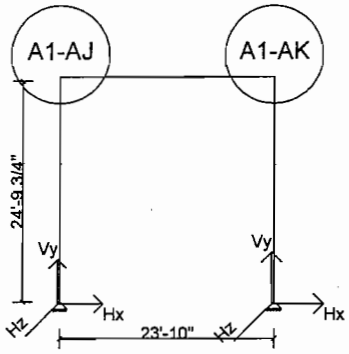
**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |

| | | | | |
|---|---|---|---|---|
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Wall: 2**
Frame ID:Portal Frame

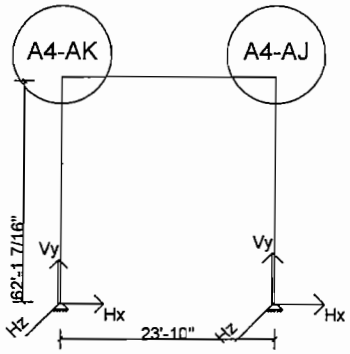
Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

**Wall: 4**
Frame ID:Portal Frame

Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

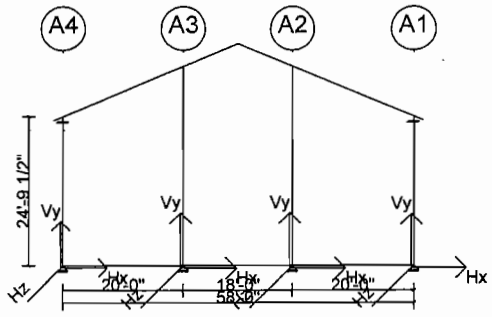
**Wall: 4, Frame at: 1/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Wall: 4, Frame at: 1/0/0**
Frame ID:CB2 End

Frame Type:Continuous Beam




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: AM**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Exterior Column | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
| Grid1 - Grid2 | | AM-A4 | | AM-A3 | | | AM-A2 | | | AM-A1 | | |
| Base Plate W x L (in.) | | 10 x 13 | | 11 x 13 | | | 11 x 14 | | | 10 x 13 | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | 100'-0" | | | 100'-0" | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |
| D | Frm | 0.1 | 1.7 | - | - | 2.3 | - | - | 2.3 | -0.1 | 1.7 | - |
| FD | Frm | 0.1 | 7.6 | - | - | 14.1 | - | - | 14.1 | -0.1 | 7.6 | - |
| CG | Frm | 0.1 | 0.9 | - | - | 1.3 | - | - | 1.4 | -0.1 | 0.9 | - |
| L> | Frm | 0.2 | 3.5 | - | - | 5.3 | - | - | 5.4 | -0.2 | 3.5 | - |
| <L | Frm | 0.2 | 3.5 | - | - | 5.3 | - | - | 5.4 | -0.2 | 3.5 | - |
| S> | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| <S | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| S | Frm | 0.0 | 0.4 | - | - | 0.6 | - | - | 0.6 | -0.0 | 0.4 | - |
| SD | Frm | - | - | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - | - | - |
| US1* | Frm | - | 0.3 | - | - | 1.1 | - | - | 0.5 | - | 0.0 | - |
| *US1 | Frm | - | 0.1 | - | - | 0.5 | - | - | 1.2 | - | 0.3 | - |
| W1> | Frm | 4.4 | -0.2 | - | 7.5 | -8.9 | - | 7.4 | 2.5 | 4.9 | -8.0 | - |
| <W1 | Frm | -4.6 | -7.4 | - | -6.7 | 1.8 | - | -6.7 | -9.3 | -4.7 | 0.4 | - |
| W2> | Frm | 3.4 | 2.8 | - | - | -8.2 | - | - | 3.0 | 5.8 | -5.1 | - |
| <W2 | Frm | -5.5 | -4.5 | - | - | 2.5 | - | - | -8.8 | -3.7 | 3.3 | - |
| WP | Frm | 2.0 | -7.5 | - | - | -2.3 | - | - | -2.0 | -2.0 | -7.6 | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.2 | 14.0 | - | - | 25.9 | - | - | 25.9 | -0.2 | 13.9 | - |
| L | Frm | 0.2 | 3.5 | - | - | 5.3 | - | - | 5.4 | -0.2 | 3.5 | - |
| E> | Frm | 1.2 | 1.1 | - | 1.0 | -1.5 | - | 1.0 | 1.6 | 1.3 | -1.3 | - |
| EG+ | Frm | - | 0.2 | - | - | 0.4 | - | - | 0.4 | - | 0.2 | - |
| <E | Frm | -1.2 | -1.1 | - | -1.0 | 1.5 | - | -1.0 | -1.6 | -1.3 | 1.3 | - |
| EG- | Frm | - | -0.2 | - | - | -0.4 | - | - | -0.4 | - | -0.2 | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: AM**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | AM-A4 | | AM-A3 | | | AM-A2 | | | AM-A1 | | |
| Ld | Description | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |

| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | D + FD + CG + L> | 0.5 | 13.7 | - | - | 23.1 | - | - | 23.3 | -0.5 | 13.6 | - |
| 2 | D + FD + CG + <L | 0.5 | 13.7 | - | - | 23.1 | - | - | 23.3 | -0.5 | 13.6 | - |
| 3 | D + FD + CG + S> | 0.3 | 10.6 | - | - | 18.4 | - | - | 18.4 | -0.3 | 10.6 | - |
| 4 | D + FD + CG + <S | 0.3 | 10.6 | - | - | 18.4 | - | - | 18.4 | -0.3 | 10.6 | - |
| 5 | D + FD + CG + S + SD | 0.3 | 10.6 | - | - | 18.4 | - | - | 18.4 | -0.3 | 10.6 | - |
| 6 | D + FD + CG + S + SS | 0.3 | 10.6 | - | - | 18.4 | - | - | 18.4 | -0.3 | 10.6 | - |
| 7 | D + FD + CG + US1* | 0.2 | 10.5 | - | - | 18.9 | - | - | 18.4 | -0.2 | 10.2 | - |
| 8 | D + FD + CG + *US1 | 0.2 | 10.3 | - | - | 18.2 | - | - | 19.0 | -0.2 | 10.5 | - |
| 9 | D + FD + CG + W1> | 4.6 | 10.1 | - | 7.5 | 8.9 | - | 7.4 | 20.3 | 4.6 | 2.2 | - |
| 10 | D + FD + CG + <W1 | -4.3 | 2.8 | - | -6.7 | 19.6 | - | -6.7 | 8.5 | -4.9 | 10.5 | - |
| 11 | D + FD + CG + W2> | 3.7 | 13.0 | - | - | 9.5 | - | - | 20.8 | 5.6 | 5.1 | - |
| 12 | D + FD + CG + <W2 | -5.3 | 5.7 | - | - | 20.2 | - | - | 9.0 | -3.9 | 13.5 | - |
| 13 | D + FD + CG + WP | 2.2 | 2.7 | - | - | 15.4 | - | - | 15.8 | -2.2 | 2.6 | - |
| 14 | D + FD + CU + W1> | 4.5 | 5.5 | - | 7.5 | 1.0 | - | 7.4 | 12.3 | 4.7 | -2.4 | - |
| 15 | D + FD + CU + <W1 | -4.5 | -1.8 | - | -6.7 | 11.7 | - | -6.7 | 0.6 | -4.8 | 6.0 | - |
| 16 | D + FD + CU + W2> | 3.5 | 8.4 | - | - | 1.6 | - | - | 12.9 | 5.7 | 0.5 | - |
| 17 | D + FD + CU + <W2 | -5.4 | 1.1 | - | - | 12.3 | - | - | 1.1 | -3.8 | 8.9 | - |
| 18 | D + FD + CU + WP | 2.1 | -1.9 | - | - | 7.5 | - | - | 7.8 | -2.1 | -2.0 | - |
| 19 | D + FD + CG + FL | 0.5 | 24.2 | - | - | 43.7 | - | - | 43.7 | -0.5 | 24.1 | - |
| 20 | D + FD + CG | 0.2 | 10.2 | - | - | 17.8 | - | - | 17.8 | -0.2 | 10.2 | - |
| 21 | D + FD + CG + L + W1> | 3.7 | 12.7 | - | 5.6 | 15.1 | - | 5.6 | 23.8 | 3.2 | 6.8 | - |
| 22 | D + FD + CG + L + <W1 | -3.0 | 7.3 | - | -5.0 | 23.1 | - | -5.0 | 14.9 | -3.9 | 13.1 | - |
| 23 | D + FD + CG + L + W2> | 3.0 | 14.9 | - | - | 15.6 | - | - | 24.1 | 3.9 | 9.0 | - |
| 24 | D + FD + CG + L + <W2 | -3.7 | 9.5 | - | - | 23.6 | - | - | 15.3 | -3.2 | 15.3 | - |
| 25 | D + FD + CG + L + WP | 1.9 | 7.2 | - | - | 20.0 | - | - | 20.4 | -1.9 | 7.1 | - |
| 26 | D + FD + CG + S + W1> | 3.6 | 10.4 | - | 5.6 | 11.6 | - | 5.6 | 20.1 | 3.4 | 4.5 | - |
| 27 | D + FD + CG + S + <W1 | -3.2 | 5.0 | - | -5.0 | 19.6 | - | -5.0 | 11.3 | -3.8 | 10.8 | - |
| 28 | D + FD + CG + S + W2> | 2.8 | 12.6 | - | - | 12.1 | - | - | 20.5 | 4.1 | 6.7 | - |
| 29 | D + FD + CG + S + <W2 | -3.9 | 7.1 | - | - | 20.1 | - | - | 11.7 | -3.0 | 13.0 | - |
| 30 | D + FD + CG + S + WP | 1.8 | 4.9 | - | - | 16.5 | - | - | 16.8 | -1.8 | 4.8 | - |
| 31 | D + FD + CG + L> + FL | 0.6 | 23.3 | - | - | 41.2 | - | - | 41.3 | -0.6 | 23.2 | - |
| 32 | D + FD + CG + <L + FL | 0.6 | 23.3 | - | - | 41.2 | - | - | 41.3 | -0.6 | 23.2 | - |
| 33 | D + FD + CG + S + FL | 0.4 | 21.0 | - | - | 37.7 | - | - | 37.7 | -0.4 | 21.0 | - |
| 34 | D+FD+CG+L+W1>+FL | 3.9 | 23.2 | - | 5.6 | 34.6 | - | 5.6 | 43.2 | 3.1 | 17.2 | - |
| 35 | D+FD+CG+L+<W1+FL | -2.8 | 17.7 | - | -5.0 | 42.6 | - | -5.0 | 34.4 | -4.1 | 23.5 | - |
| 36 | D+FD+CG+L+W2>+FL | 3.1 | 25.4 | - | - | 35.0 | - | - | 43.6 | 3.8 | 19.4 | - |
| 37 | D+FD+CG+L+<W2+FL | -3.6 | 19.9 | - | - | 43.0 | - | - | 34.7 | -3.4 | 25.7 | - |
| 38 | D+FD+CG+L+WP+FL | 2.1 | 17.7 | - | - | 39.4 | - | - | 39.8 | -2.1 | 17.5 | - |
| 39 | D+FD+CG+S+W1>+FL | 3.7 | 20.9 | - | 5.6 | 31.0 | - | 5.6 | 39.6 | 3.2 | 14.9 | - |
| 40 | D+FD+CG+S+<W1+FL | -3.0 | 15.4 | - | -5.0 | 39.0 | - | -5.0 | 30.7 | -3.9 | 21.2 | - |
| 41 | D+FD+CG+S+W2>+FL | 3.0 | 23.1 | - | - | 31.5 | - | - | 40.0 | 3.9 | 17.2 | - |
| 42 | D+FD+CG+S+<W2+FL | -3.7 | 17.6 | - | - | 39.5 | - | - | 31.1 | -3.2 | 23.4 | - |
| 43 | D+FD+CG+S+WP+FL | 1.9 | 15.4 | - | - | 35.9 | - | - | 36.2 | -1.9 | 15.2 | - |
| 44 | D + FD + CG + FL | 0.4 | 20.7 | - | - | 37.2 | - | - | 37.2 | -0.4 | 20.6 | - |
| 45 | D + FD + CG + E> + EG+ | 1.1 | 11.2 | - | 0.7 | 17.0 | - | 0.7 | 19.2 | 0.6 | 9.5 | - |
| 46 | D + FD + CG + <E + EG+ | -0.6 | 9.6 | - | -0.7 | 19.1 | - | -0.7 | 17.0 | -1.1 | 11.2 | - |
| 47 | D + FD + CU + E> + EG- | 0.9 | 6.2 | - | 0.7 | 8.5 | - | 0.7 | 10.7 | 0.8 | 4.5 | - |
| 48 | D + FD + CU + <E + EG- | -0.7 | 4.7 | - | -0.7 | 10.6 | - | -0.7 | 8.4 | -1.0 | 6.3 | - |
| 49 | D + FD + CG + E> + EG+ | 0.9 | 10.9 | - | 0.5 | 17.2 | - | 0.5 | 18.9 | 0.4 | 9.6 | - |
| 50 | D + FD + CG + <E + EG+ | -0.4 | 9.8 | - | -0.5 | 18.8 | - | -0.5 | 17.2 | -0.9 | 11.0 | - |
| 51 | D+FD+CG+E>+EG++FL | 1.0 | 21.4 | - | 0.5 | 36.7 | - | 0.5 | 38.3 | 0.3 | 20.1 | - |
| 52 | D+FD+CG+<E+EG++FL | -0.2 | 20.2 | - | -0.5 | 38.2 | - | -0.5 | 36.6 | -1.1 | 21.4 | - |

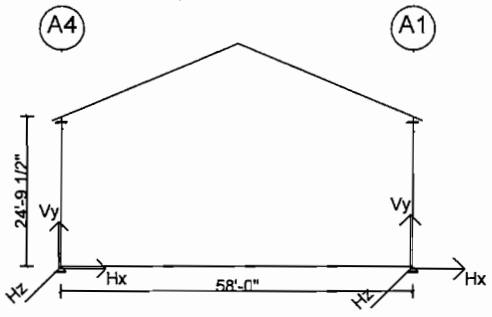
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | AM-A4 | 5.4 | 17 | 4.6 | 9 | - | - | - | - | 1.9 | 18 | 25.4 | 36 | - | - | - | - |
| 20/0/0 | AM-A3 | - | - | - | - | 6.7 | 10 | 7.5 | 9 | - | - | 43.7 | 19 | - | - | - | - |
| 38/0/0 | AM-A2 | - | - | - | - | 6.7 | 10 | 7.4 | 9 | - | - | 43.7 | 19 | - | - | - | - |
| 58/0/0 | AM-A1 | 4.9 | 10 | 5.7 | 16 | - | - | - | - | 2.4 | 14 | 25.7 | 37 | - | - | - | - |

**Wall: 4, Frame at: 24/10/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: AL**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | AL-A4 | | AL-A1 | | | | |
| Base Plate W x L (in.) | | 10 x 15 | | 11 x 16 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.3 | 4.9 | -1.3 | 4.7 | - | - | - |
| FD | Frm | 0.2 | 15.0 | -0.2 | 15.0 | - | - | - |
| CG | Frm | 1.3 | 3.6 | -1.3 | 3.6 | - | - | - |
| L> | Frm | 5.0 | 14.4 | -5.0 | 14.4 | - | - | - |
| <L | Frm | 5.0 | 14.4 | -5.0 | 14.4 | - | - | - |
| S> | Frm | 0.6 | 1.7 | -0.6 | 1.7 | - | - | - |
| <S | Frm | 0.6 | 1.7 | -0.6 | 1.7 | - | - | - |
| S | Frm | 0.6 | 1.7 | -0.6 | 1.7 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | 0.8 | 2.0 | -0.8 | 1.3 | - | - | - |
| *US1 | Frm | 0.7 | 1.3 | -0.7 | 2.0 | - | - | - |
| W1> | Frm | 5.9 | -7.6 | 11.6 | -15.2 | - | - | - |
| <W1 | Frm | -11.6 | -15.2 | -5.9 | -7.6 | - | - | - |
| W2> | Frm | 4.6 | -1.2 | 12.9 | -8.8 | - | - | - |
| <W2 | Frm | -12.9 | -8.8 | -4.6 | -1.2 | - | - | - |
| WP | Frm | 3.5 | -12.0 | -3.5 | -12.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.4 | 27.5 | -0.4 | 27.5 | - | - | - |
| L | Frm | 5.0 | 14.4 | -5.0 | 14.4 | - | - | - |
| E> | Frm | 2.9 | 1.5 | 2.9 | -1.5 | - | - | - |
| EG+ | Frm | 0.1 | 0.6 | -0.1 | 0.6 | - | - | - |
| <E | Frm | -2.9 | -1.5 | -2.9 | 1.5 | - | - | - |
| EG- | Frm | -0.1 | -0.6 | 0.1 | -0.6 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: AL**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | AL-A4 | | AL-A1 | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |

| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | D + FD + CG + L> | 7.8 | 37.9 | -7.8 | 37.8 | - | - | - |
| 2 | D + FD + CG + <L | 7.8 | 37.9 | -7.8 | 37.8 | - | - | - |
| 3 | D + FD + CG + S> | 3.3 | 25.2 | -3.3 | 25.1 | - | - | - |
| 4 | D + FD + CG + <S | 3.3 | 25.2 | -3.3 | 25.1 | - | - | - |
| 5 | D + FD + CG + S + SD | 3.3 | 25.2 | -3.3 | 25.1 | - | - | - |
| 6 | D + FD + CG + S + SS | 3.3 | 25.2 | -3.3 | 25.1 | - | - | - |
| 7 | D + FD + CG + US1* | 3.5 | 25.5 | -3.5 | 24.7 | - | - | - |
| 8 | D + FD + CG + *US1 | 3.5 | 24.7 | -3.5 | 25.4 | - | - | - |
| 9 | D + FD + CG + W1> | 8.6 | 15.9 | 8.9 | 8.2 | - | - | - |
| 10 | D + FD + CG + <W1 | -8.9 | 8.3 | -8.6 | 15.8 | - | - | - |
| 11 | D + FD + CG + W2> | 7.4 | 22.3 | 10.1 | 14.6 | - | - | - |
| 12 | D + FD + CG + <W2 | -10.1 | 14.7 | -7.4 | 22.2 | - | - | - |
| 13 | D + FD + CG + WP | 6.2 | 11.5 | -6.2 | 11.4 | - | - | - |
| 14 | D + FD + CU + W1> | 6.8 | 4.3 | 10.7 | -3.4 | - | - | - |
| 15 | D + FD + CU + <W1 | -10.7 | -3.3 | -6.8 | 4.3 | - | - | - |
| 16 | D + FD + CU + W2> | 5.5 | 10.7 | 12.0 | 3.1 | - | - | - |
| 17 | D + FD + CU + <W2 | -12.0 | 3.1 | -5.5 | 10.7 | - | - | - |
| 18 | D + FD + CU + WP | 4.4 | -0.0 | -4.4 | -0.1 | - | - | - |
| 19 | D + FD + CG + FL | 3.2 | 50.9 | -3.2 | 50.9 | - | - | - |
| 20 | D + FD + CG | 2.8 | 23.5 | -2.8 | 23.4 | - | - | - |
| 21 | D + FD + CG + L + W1> | 10.9 | 28.6 | 2.2 | 22.8 | - | - | - |
| 22 | D + FD + CG + L + <W1 | -2.2 | 22.9 | -11.0 | 28.5 | - | - | - |
| 23 | D + FD + CG + L + W2> | 10.0 | 33.4 | 3.1 | 27.6 | - | - | - |
| 24 | D + FD + CG + L + <W2 | -3.1 | 27.7 | -10.0 | 33.3 | - | - | - |
| 25 | D + FD + CG + L + WP | 9.1 | 25.3 | -9.1 | 25.2 | - | - | - |
| 26 | D + FD + CG + S + W1> | 7.6 | 19.0 | 5.5 | 13.2 | - | - | - |
| 27 | D + FD + CG + S + <W1 | -5.5 | 13.3 | -7.6 | 18.9 | - | - | - |
| 28 | D + FD + CG + S + W2> | 6.6 | 23.9 | 6.5 | 18.1 | - | - | - |
| 29 | D + FD + CG + S + <W2 | -6.5 | 18.2 | -6.7 | 23.8 | - | - | - |
| 30 | D + FD + CG + S + WP | 5.8 | 15.8 | -5.8 | 15.7 | - | - | - |
| 31 | D + FD + CG + L> + FL | 6.9 | 54.9 | -6.9 | 54.9 | - | - | - |
| 32 | D + FD + CG + <L + FL | 6.9 | 54.9 | -6.9 | 54.9 | - | - | - |
| 33 | D + FD + CG + S + FL | 3.5 | 45.3 | -3.5 | 45.3 | - | - | - |
| 34 | D+FD+CG+L+W1>+FL | 11.3 | 49.2 | 1.9 | 43.5 | - | - | - |
| 35 | D+FD+CG+L+<W1+FL | -1.8 | 43.5 | -11.3 | 49.2 | - | - | - |
| 36 | D+FD+CG+L+W2>+FL | 10.3 | 54.0 | 2.8 | 48.3 | - | - | - |
| 37 | D+FD+CG+L+<W2+FL | -2.8 | 48.3 | -10.3 | 54.0 | - | - | - |
| 38 | D+FD+CG+L+WP+FL | 9.5 | 45.9 | -9.5 | 45.9 | - | - | - |
| 39 | D+FD+CG+S+W1>+FL | 7.9 | 39.6 | 5.2 | 33.9 | - | - | - |
| 40 | D+FD+CG+S+<W1+FL | -5.2 | 33.9 | -7.9 | 39.6 | - | - | - |
| 41 | D+FD+CG+S+W2>+FL | 7.0 | 44.5 | 6.2 | 38.7 | - | - | - |
| 42 | D+FD+CG+S+<W2+FL | -6.1 | 38.8 | -7.0 | 44.4 | - | - | - |
| 43 | D+FD+CG+S+WP+FL | 6.1 | 36.4 | -6.1 | 36.3 | - | - | - |
| 44 | D + FD + CG + FL | 3.1 | 44.1 | -3.1 | 44.0 | - | - | - |
| 45 | D + FD + CG + E> + EG+ | 4.8 | 25.0 | -0.8 | 22.7 | - | - | - |
| 46 | D + FD + CG + <E + EG+ | 0.8 | 22.8 | -4.8 | 24.9 | - | - | - |
| 47 | D + FD + CU + E> + EG- | 2.8 | 12.6 | 1.1 | 10.4 | - | - | - |
| 48 | D + FD + CU + <E + EG- | -1.2 | 10.4 | -2.8 | 12.5 | - | - | - |
| 49 | D + FD + CG + E> + EG+ | 4.3 | 24.6 | -1.3 | 22.9 | - | - | - |
| 50 | D + FD + CG + <E + EG+ | 1.3 | 23.0 | -4.3 | 24.5 | - | - | - |
| 51 | D+FD+CG+E>+EG++FL | 4.6 | 45.2 | -1.6 | 43.5 | - | - | - |
| 52 | D+FD+CG+<E+EG++FL | 1.6 | 43.6 | -4.6 | 45.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | AL-A4 | 12.0 | 17 | 11.3 | 34 | - | - | - | - | 3.3 | 15 | 54.9 | 31 | - | - | - | - |
| 58/0/0 | AL-A1 | 11.3 | 35 | 12.0 | 16 | - | - | - | - | 3.4 | 14 | 54.9 | 31 | - | - | - | - |

## Wall: 4, Frame at: 48/4/0

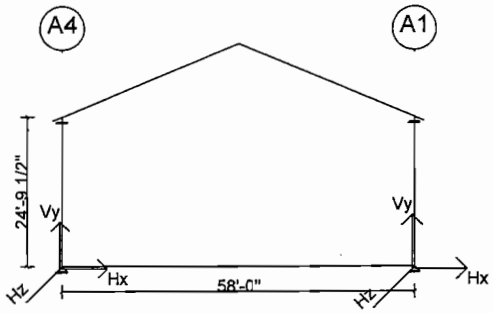
**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 18 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 41 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 42 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + FD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + FD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+FD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+FD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+L+WP+FL+WB1> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB1> | D+FD+CG+S+WP+FL+WB1> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + FD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + FD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+FD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+FD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+L+WP+FL+<WB1 |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB1 | D+FD+CG+S+WP+FL+<WB1 |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + FD + CG + WP + WB2> |
| 60 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + FD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+FD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+FD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+L+WP+FL+WB2> |

| | | | | |
|---|---|---|---|---|
| 64 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 WB2> | D+FD+CG+S+WP+FL+WB2> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + FD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + FD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+FD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+FD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+L+WP+FL+<WB2 |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL + 0.750 <WB2 | D+FD+CG+S+WP+FL+<WB2 |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + FD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + FD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + FD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 EB> + 0.525 EG+ + 0.750 FL | D+FD+CG+EB>+EG++FL |
| 75 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + FD + CG + <EB + EG+ |
| 76 | System Derived | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + FD + CU + <EB + EG- |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + FD + CG + <EB + EG+ |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <EB + 0.525 EG+ + 0.750 FL | D+FD+CG+<EB+EG++FL |

**Wall: 4, Frame at: 48/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: AK**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 58/0/0 | | | | | |
| Grid1 - Grid2 | | AK-A4 | | | AK-A1 | | | | | |
| Base Plate W x L (in.) | | 11 x 13 | | | 11 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.3 | 0.0 | 7.2 | -1.3 | -0.0 | 7.6 | - | - | - |
| FD | Frm | 0.3 | - | 15.0 | -0.3 | - | 15.0 | - | - | - |
| CG | Frm | 1.3 | - | 3.6 | -1.3 | - | 3.6 | - | - | - |
| L> | Frm | 5.1 | - | 14.4 | -5.1 | - | 14.4 | - | - | - |
| <L | Frm | 5.1 | - | 14.4 | -5.1 | - | 14.4 | - | - | - |
| S> | Frm | 0.6 | - | 1.7 | -0.6 | - | 1.7 | - | - | - |
| <S | Frm | 0.6 | - | 1.7 | -0.6 | - | 1.7 | - | - | - |
| S | Frm | 0.6 | - | 1.7 | -0.6 | - | 1.7 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - |
| US1* | Frm | 0.8 | - | 2.0 | -0.8 | - | 1.3 | - | - | - |
| *US1 | Frm | 0.7 | - | 1.3 | -0.7 | - | 2.0 | - | - | - |
| W1> | Frm | 5.8 | - | -7.6 | 11.7 | - | -15.2 | - | - | - |
| <W1 | Frm | -11.7 | - | -15.2 | -5.8 | - | -7.6 | - | - | - |
| W2> | Frm | 4.6 | - | -1.2 | 12.9 | - | -8.8 | - | - | - |
| <W2 | Frm | -12.9 | - | -8.8 | -4.6 | - | -1.2 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.5 | - | 27.5 | -0.5 | - | 27.5 | - | - | - |
| L | Frm | 5.1 | - | 14.4 | -5.1 | - | 14.4 | - | - | - |
| E> | Frm | 2.9 | - | 1.5 | 2.9 | - | -1.5 | - | - | - |
| EG+ | Frm | 0.1 | - | 0.6 | -0.1 | - | 0.6 | - | - | - |
| <E | Frm | -2.9 | - | -1.5 | -2.9 | - | 1.5 | - | - | - |
| EG- | Frm | -0.1 | - | -0.6 | 0.1 | - | -0.6 | - | - | - |
| WP | Frm | 3.7 | - | -11.1 | -3.7 | - | -11.0 | - | - | - |
| WB1> | Brc | 0.2 | -4.8 | -21.5 | -0.2 | 4.8 | -21.0 | - | - | - |
| <WB1 | Brc | -0.2 | 5.3 | 22.6 | 0.2 | -5.3 | 22.1 | - | - | - |
| WB2> | Brc | 0.2 | -5.7 | -25.3 | -0.2 | 5.7 | -24.7 | - | - | - |
| <WB2 | Brc | -0.1 | 4.4 | 18.7 | 0.1 | -4.4 | 18.3 | - | - | - |
| EB> | Brc | 0.1 | -1.6 | -7.1 | -0.1 | 1.6 | -7.1 | - | - | - |
| <EB | Brc | -0.1 | 1.7 | 7.1 | 0.1 | -1.7 | 7.1 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: AK**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | | 58/0/0 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | AK-A4 | | | AK-A1 | | | | | |
| Ld | Description | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | | | |
| 1 | D + FD + CG + L> | 7.9 | 0.0 | 40.2 | -7.9 | -0.0 | 40.7 | - | - | - |
| 2 | D + FD + CG + <L | 7.9 | 0.0 | 40.2 | -7.9 | -0.0 | 40.7 | - | - | - |
| 3 | D + FD + CG + S> | 3.4 | 0.0 | 27.5 | -3.4 | -0.0 | 27.9 | - | - | - |
| 4 | D + FD + CG + <S | 3.4 | 0.0 | 27.5 | -3.4 | -0.0 | 27.9 | - | - | - |
| 5 | D + FD + CG + S + SD | 3.4 | 0.0 | 27.5 | -3.4 | -0.0 | 27.9 | - | - | - |
| 6 | D + FD + CG + S + SS | 3.4 | 0.0 | 27.5 | -3.4 | -0.0 | 27.9 | - | - | - |
| 7 | D + FD + CG + US1* | 3.6 | 0.0 | 27.8 | -3.6 | -0.0 | 27.5 | - | - | - |
| 8 | D + FD + CG + *US1 | 3.6 | 0.0 | 27.1 | -3.6 | -0.0 | 28.3 | - | - | - |
| 9 | D + FD + CG + W1> | 8.6 | 0.0 | 18.2 | 8.9 | -0.0 | 11.0 | - | - | - |
| 10 | D + FD + CG + <W1 | -8.9 | 0.0 | 10.6 | -8.6 | -0.0 | 18.6 | - | - | - |
| 11 | D + FD + CG + W2> | 7.4 | 0.0 | 24.6 | 10.1 | -0.0 | 17.5 | - | - | - |
| 12 | D + FD + CG + <W2 | -10.1 | 0.0 | 17.0 | -7.4 | -0.0 | 25.0 | - | - | - |
| 13 | D + FD + CU + W1> | 6.8 | 0.0 | 5.7 | 10.8 | -0.0 | -1.6 | - | - | - |
| 14 | D + FD + CU + <W1 | -10.8 | 0.0 | -1.9 | -6.8 | -0.0 | 6.0 | - | - | - |
| 15 | D + FD + CU + W2> | 5.5 | 0.0 | 12.1 | 12.0 | -0.0 | 4.8 | - | - | - |
| 16 | D + FD + CU + <W2 | -12.0 | 0.0 | 4.5 | -5.5 | -0.0 | 12.4 | - | - | - |
| 17 | D + FD + CG + FL | 3.3 | 0.0 | 53.3 | -3.3 | -0.0 | 53.7 | - | - | - |
| 18 | D + FD + CG | 2.8 | 0.0 | 25.8 | -2.8 | -0.0 | 26.2 | - | - | - |
| 19 | D + FD + CG + L + W1> | 11.0 | 0.0 | 30.9 | 2.1 | -0.0 | 25.7 | - | - | - |
| 20 | D + FD + CG + L + <W1 | -2.1 | 0.0 | 25.2 | -11.0 | -0.0 | 31.4 | - | - | - |
| 21 | D + FD + CG + L + W2> | 10.1 | 0.0 | 35.7 | 3.0 | -0.0 | 30.5 | - | - | - |
| 22 | D + FD + CG + L + <W2 | -3.0 | 0.0 | 30.1 | -10.1 | -0.0 | 36.2 | - | - | - |
| 23 | D + FD + CG + S + W1> | 7.6 | 0.0 | 21.4 | 5.5 | -0.0 | 16.1 | - | - | - |
| 24 | D + FD + CG + S + <W1 | -5.5 | 0.0 | 15.7 | -7.6 | -0.0 | 21.8 | - | - | - |
| 25 | D + FD + CG + S + W2> | 6.7 | 0.0 | 26.2 | 6.4 | -0.0 | 20.9 | - | - | - |
| 26 | D + FD + CG + S + <W2 | -6.4 | 0.0 | 20.5 | -6.7 | -0.0 | 26.6 | - | - | - |
| 27 | D + FD + CG + L> + FL | 7.0 | 0.0 | 57.3 | -7.0 | -0.0 | 57.7 | - | - | - |
| 28 | D + FD + CG + <L + FL | 7.0 | 0.0 | 57.3 | -7.0 | -0.0 | 57.7 | - | - | - |
| 29 | D + FD + CG + S + FL | 3.6 | 0.0 | 47.7 | -3.6 | -0.0 | 48.1 | - | - | - |
| 30 | D+FD+CG+L+W1>+FL | 11.4 | 0.0 | 51.5 | 1.7 | -0.0 | 46.3 | - | - | - |
| 31 | D+FD+CG+L+<W1+FL | -1.7 | 0.0 | 45.9 | -11.4 | -0.0 | 52.0 | - | - | - |
| 32 | D+FD+CG+L+W2>+FL | 10.4 | 0.0 | 56.4 | 2.7 | -0.0 | 51.1 | - | - | - |
| 33 | D+FD+CG+L+<W2+FL | -2.7 | 0.0 | 50.7 | -10.4 | -0.0 | 56.8 | - | - | - |
| 34 | D+FD+CG+S+W1>+FL | 8.0 | 0.0 | 42.0 | 5.1 | -0.0 | 36.7 | - | - | - |
| 35 | D+FD+CG+S+<W1+FL | -5.1 | 0.0 | 36.3 | -8.0 | -0.0 | 42.4 | - | - | - |
| 36 | D+FD+CG+S+W2>+FL | 7.0 | 0.0 | 46.8 | 6.1 | -0.0 | 41.6 | - | - | - |
| 37 | D+FD+CG+S+<W2+FL | -6.1 | 0.0 | 41.1 | -7.0 | -0.0 | 47.2 | - | - | - |
| 38 | D + FD + CG + FL | 3.2 | 0.0 | 46.4 | -3.2 | -0.0 | 46.9 | - | - | - |
| 39 | D + FD + CG + E> + EG+ | 4.9 | 0.0 | 27.3 | -0.9 | -0.0 | 25.6 | - | - | - |
| 40 | D + FD + CG + <E + EG+ | 0.9 | 0.0 | 25.1 | -4.9 | -0.0 | 27.7 | - | - | - |
| 41 | D + FD + CU + E> + EG- | 2.9 | 0.0 | 14.0 | 1.1 | -0.0 | 12.1 | - | - | - |
| 42 | D + FD + CU + <E + EG- | -1.1 | 0.0 | 11.8 | -2.9 | -0.0 | 14.2 | - | - | - |
| 43 | D + FD + CG + E> + EG+ | 4.4 | 0.0 | 26.9 | -1.4 | -0.0 | 25.7 | - | - | - |
| 44 | D + FD + CG + <E + EG+ | 1.4 | 0.0 | 25.3 | -4.4 | -0.0 | 27.3 | - | - | - |
| 45 | D+FD+CG+E>+EG++FL | 4.7 | 0.0 | 47.5 | -1.7 | -0.0 | 46.4 | - | - | - |
| 46 | D+FD+CG+<E+EG++FL | 1.7 | 0.0 | 45.9 | -4.7 | -0.0 | 48.0 | - | - | - |
| 47 | D + FD + CG + WP + WB1> | 6.7 | -4.8 | -6.7 | -6.7 | 4.8 | -5.8 | - | - | - |
| 48 | D + FD + CU + WP + WB1> | 4.8 | -4.8 | -19.2 | -4.8 | 4.8 | -18.4 | - | - | - |
| 49 | D+FD+CG+L+WP+WB1> | 9.6 | -3.6 | 12.2 | -9.6 | 3.6 | 13.1 | - | - | - |
| 50 | D+FD+CG+S+WP+WB1> | 6.2 | -3.6 | 2.7 | -6.2 | 3.6 | 3.5 | - | - | - |
| 51 | D+FD+CG+L+WP+FL+WB1> | 9.9 | -3.6 | 32.9 | -9.9 | 3.6 | 33.7 | - | - | - |
| 52 | D+FD+CG+S+WP+FL+WB1> | 6.5 | -3.6 | 23.3 | -6.5 | 3.6 | 24.1 | - | - | - |
| 53 | D + FD + CG + WP + <WB1 | 6.4 | 5.3 | 37.3 | -6.4 | -5.3 | 37.3 | - | - | - |
| 54 | D + FD + CU + WP + <WB1 | 4.5 | 5.3 | 24.8 | -4.5 | -5.3 | 24.6 | - | - | - |
| 55 | D+FD+CG+L+WP+<WB1 | 9.3 | 4.0 | 45.3 | -9.3 | -4.0 | 45.3 | - | - | - |
| 56 | D+FD+CG+S+WP+<WB1 | 5.9 | 4.0 | 35.7 | -5.9 | -4.0 | 35.8 | - | - | - |
| 57 | D+FD+CG+L+WP+FL+<WB1 | 9.7 | 4.0 | 65.9 | -9.7 | -4.0 | 66.0 | - | - | - |
| 58 | D+FD+CG+S+WP+FL+<WB1 | 6.3 | 4.0 | 56.3 | -6.3 | -4.0 | 56.4 | - | - | - |
| 59 | D + FD + CG + WP + WB2> | 6.7 | -5.6 | -10.6 | -6.7 | 5.7 | -9.5 | - | - | - |
| 60 | D + FD + CU + WP + WB2> | 4.8 | -5.6 | -23.1 | -4.8 | 5.7 | -22.2 | - | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 61 | D+FD+CG+L+WP+WB2> | 9.6 | -4.2 | 9.3 | -9.6 | 4.2 | 10.2 | - | - | - |
| 62 | D+FD+CG+S+WP+WB2> | 6.2 | -4.2 | -0.2 | -6.2 | 4.2 | 0.7 | - | - | - |
| 63 | D+FD+CG+L+WP+FL+WB2> | 10.0 | -4.2 | 29.9 | -9.9 | 4.2 | 30.9 | - | - | - |
| 64 | D+FD+CG+S+WP+FL+WB2> | 6.6 | -4.2 | 20.4 | -6.5 | 4.2 | 21.3 | - | - | - |
| 65 | D + FD + CG + WP + <WB2 | 6.4 | 4.4 | 33.4 | -6.4 | -4.4 | 33.5 | - | - | - |
| 66 | D + FD + CU + WP + <WB2 | 4.5 | 4.4 | 20.9 | -4.5 | -4.4 | 20.8 | - | - | - |
| 67 | D+FD+CG+L+WP+<WB2 | 9.4 | 3.3 | 42.4 | -9.4 | -3.3 | 42.5 | - | - | - |
| 68 | D+FD+CG+S+WP+<WB2 | 6.0 | 3.3 | 32.8 | -6.0 | -3.3 | 32.9 | - | - | - |
| 69 | D+FD+CG+L+WP+FL+<WB2 | 9.7 | 3.3 | 63.0 | -9.7 | -3.3 | 63.1 | - | - | - |
| 70 | D+FD+CG+S+WP+FL+<WB2 | 6.3 | 3.3 | 53.4 | -6.3 | -3.3 | 53.6 | - | - | - |
| 71 | D + FD + CG + EB> + EG+ | 2.9 | -1.1 | 21.2 | -2.9 | 1.1 | 21.7 | - | - | - |
| 72 | D + FD + CU + EB> + EG- | 0.9 | -1.1 | 7.9 | -0.9 | 1.1 | 8.2 | - | - | - |
| 73 | D + FD + CG + EB> + EG+ | 2.9 | -0.8 | 22.4 | -2.9 | 0.8 | 22.8 | - | - | - |
| 74 | D+FD+CG+EB>+EG++FL | 3.2 | -0.8 | 43.0 | -3.2 | 0.8 | 43.4 | - | - | - |
| 75 | D + FD + CG + <EB + EG+ | 2.8 | 1.2 | 31.2 | -2.8 | -1.2 | 31.6 | - | - | - |
| 76 | D + FD + CU + <EB + EG- | 0.8 | 1.2 | 17.9 | -0.8 | -1.2 | 18.1 | - | - | - |
| 77 | D + FD + CG + <EB + EG+ | 2.8 | 0.9 | 29.8 | -2.8 | -0.9 | 30.3 | - | - | - |
| 78 | D+FD+CG+<EB+EG++FL | 3.2 | 0.9 | 50.5 | -3.2 | -0.9 | 50.9 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

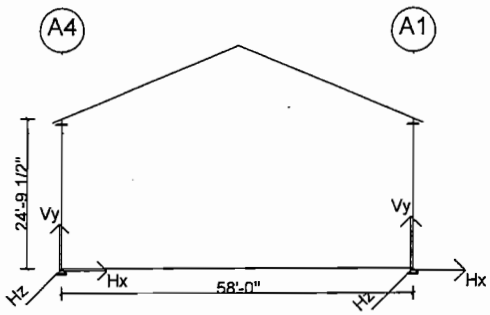
| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | AK-A4 | 12.0 | 16 | 11.4 | 30 | 5.6 | 60 | 5.3 | 53 | 23.1 | 60 | 65.9 | 57 | - | - | - | - |
| 58/0/0 | AK-A1 | 11.4 | 31 | 12.0 | 15 | 5.3 | 53 | 5.7 | 60 | 22.2 | 60 | 66.0 | 57 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | A4-AK | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |
| 58/0/0 | A1-AK | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

**Wall: 4, Frame at: 72/2/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: AJ**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 58/0/0 | | | | | |
| Grid1 - Grid2 | | AJ-A4 | | | AJ-A1 | | | | | |
| Base Plate W x L (in.) | | 10 x 13 | | | 10 x 18 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.2 | -0.0 | 7.0 | -1.2 | 0.0 | 7.6 | - | - | - |
| FD | Frm | 0.2 | - | 14.9 | -0.2 | - | 15.1 | - | - | - |
| CG | Frm | 1.2 | - | 3.5 | -1.2 | - | 3.6 | - | - | - |
| L> | Frm | 4.9 | - | 14.1 | -4.9 | - | 14.5 | - | - | - |
| <L | Frm | 4.9 | - | 14.1 | -4.9 | - | 14.5 | - | - | - |
| S> | Frm | 0.6 | - | 1.6 | -0.6 | - | 1.7 | - | - | - |
| <S | Frm | 0.6 | - | 1.6 | -0.6 | - | 1.7 | - | - | - |
| S | Frm | 0.6 | - | 1.6 | -0.6 | - | 1.7 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - |
| US1* | Frm | 0.7 | - | 2.0 | -0.7 | - | 1.3 | - | - | - |
| *US1 | Frm | 0.7 | - | 1.2 | -0.7 | - | 2.0 | - | - | - |
| W1> | Frm | 2.8 | - | -8.1 | 10.9 | - | -14.5 | - | - | - |
| <W1 | Frm | -9.3 | - | -14.2 | -5.3 | - | -8.2 | - | - | - |
| W2> | Frm | 3.5 | - | -1.3 | 12.5 | - | -8.5 | - | - | - |
| <W2 | Frm | -8.7 | - | -7.3 | -3.7 | - | -2.2 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.4 | - | 27.4 | -0.4 | - | 27.6 | - | - | - |
| L | Frm | 4.9 | - | 14.1 | -4.9 | - | 14.5 | - | - | - |
| E> | Frm | 2.4 | - | 1.4 | 2.7 | - | -1.4 | - | - | - |
| EG+ | Frm | 0.1 | - | 0.6 | -0.1 | - | 0.6 | - | - | - |
| <E | Frm | -2.4 | - | -1.4 | -2.7 | - | 1.4 | - | - | - |
| EG- | Frm | -0.1 | - | -0.6 | 0.1 | - | -0.6 | - | - | - |
| WP | Frm | -0.3 | - | -11.9 | -4.4 | - | -10.1 | - | - | - |
| WB1> | Brc | -0.2 | -5.0 | 21.4 | 0.2 | 5.0 | 21.0 | - | - | - |
| <WB1 | Brc | 0.2 | 5.0 | -22.5 | -0.2 | -5.1 | -22.1 | - | - | - |
| WB2> | Brc | -0.3 | -6.0 | 25.3 | 0.3 | 5.9 | 24.8 | - | - | - |
| <WB2 | Brc | 0.2 | 4.2 | -18.7 | -0.2 | -4.2 | -18.3 | - | - | - |
| EB> | Brc | -0.1 | -1.7 | 7.1 | 0.1 | 1.7 | 7.1 | - | - | - |
| <EB | Brc | 0.1 | 1.6 | -7.1 | -0.1 | -1.6 | -7.1 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: AJ**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | | 58/0/0 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | AJ-A4 | | | AJ-A1 | | | | | |
| Ld | Description | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | | | |
| 1 | D + FD + CG + L> | 7.7 | -0.0 | 39.5 | -7.7 | 0.0 | 40.8 | - | - | - |
| 2 | D + FD + CG + <L | 7.7 | -0.0 | 39.5 | -7.7 | 0.0 | 40.8 | - | - | - |
| 3 | D + FD + CG + S> | 3.3 | -0.0 | 27.1 | -3.3 | 0.0 | 28.0 | - | - | - |
| 4 | D + FD + CG + <S | 3.3 | -0.0 | 27.1 | -3.3 | 0.0 | 28.0 | - | - | - |
| 5 | D + FD + CG + S + SD | 3.3 | -0.0 | 27.1 | -3.3 | 0.0 | 28.0 | - | - | - |
| 6 | D + FD + CG + S + SS | 3.3 | -0.0 | 27.1 | -3.3 | 0.0 | 28.0 | - | - | - |
| 7 | D + FD + CG + US1* | 3.4 | -0.0 | 27.4 | -3.4 | 0.0 | 27.6 | - | - | - |
| 8 | D + FD + CG + *US1 | 3.4 | -0.0 | 26.7 | -3.4 | 0.0 | 28.3 | - | - | - |
| 9 | D + FD + CG + W1> | 5.5 | -0.0 | 17.3 | 8.2 | 0.0 | 11.8 | - | - | - |
| 10 | D + FD + CG + <W1 | -6.6 | -0.0 | 11.2 | -8.0 | 0.0 | 18.1 | - | - | - |
| 11 | D + FD + CG + W2> | 6.2 | -0.0 | 24.1 | 9.8 | 0.0 | 17.8 | - | - | - |
| 12 | D + FD + CG + <W2 | -5.9 | -0.0 | 18.1 | -6.5 | 0.0 | 24.1 | - | - | - |
| 13 | D + FD + CU + W1> | 3.7 | -0.0 | 5.0 | 10.0 | 0.0 | -0.9 | - | - | - |
| 14 | D + FD + CU + <W1 | -8.4 | -0.0 | -1.0 | -6.2 | 0.0 | 5.4 | - | - | - |
| 15 | D + FD + CU + W2> | 4.3 | -0.0 | 11.8 | 11.6 | 0.0 | 5.1 | - | - | - |
| 16 | D + FD + CU + <W2 | -7.8 | -0.0 | 5.8 | -4.6 | 0.0 | 11.4 | - | - | - |
| 17 | D + FD + CG + FL | 3.1 | -0.0 | 52.8 | -3.1 | 0.0 | 53.9 | - | - | - |
| 18 | D + FD + CG | 2.7 | -0.0 | 25.4 | -2.7 | 0.0 | 26.3 | - | - | - |
| 19 | D + FD + CG + L + W1> | 8.5 | -0.0 | 29.9 | 1.8 | 0.0 | 26.3 | - | - | - |
| 20 | D + FD + CG + L + <W1 | -0.6 | -0.0 | 25.3 | -10.4 | 0.0 | 31.0 | - | - | - |
| 21 | D + FD + CG + L + W2> | 9.0 | -0.0 | 35.0 | 3.0 | 0.0 | 30.8 | - | - | - |
| 22 | D + FD + CG + L + <W2 | -0.1 | -0.0 | 30.5 | -9.2 | 0.0 | 35.5 | - | - | - |
| 23 | D + FD + CG + S + W1> | 5.2 | -0.0 | 20.5 | 5.0 | 0.0 | 16.7 | - | - | - |
| 24 | D + FD + CG + S + <W1 | -3.9 | -0.0 | 16.0 | -7.1 | 0.0 | 21.4 | - | - | - |
| 25 | D + FD + CG + S + W2> | 5.7 | -0.0 | 25.7 | 6.2 | 0.0 | 21.2 | - | - | - |
| 26 | D + FD + CG + S + <W2 | -3.4 | -0.0 | 21.2 | -5.9 | 0.0 | 25.9 | - | - | - |
| 27 | D + FD + CG + L> + FL | 6.7 | -0.0 | 56.5 | -6.7 | 0.0 | 57.9 | - | - | - |
| 28 | D + FD + CG + <L + FL | 6.7 | -0.0 | 56.5 | -6.7 | 0.0 | 57.9 | - | - | - |
| 29 | D + FD + CG + S + FL | 3.5 | -0.0 | 47.2 | -3.5 | 0.0 | 48.3 | - | - | - |
| 30 | D+FD+CG+L+W1>+FL | 8.8 | -0.0 | 50.4 | 1.4 | 0.0 | 47.0 | - | - | - |
| 31 | D+FD+CG+L+<W1+FL | -0.3 | -0.0 | 45.9 | -10.7 | 0.0 | 51.7 | - | - | - |
| 32 | D+FD+CG+L+W2>+FL | 9.3 | -0.0 | 55.5 | 2.6 | 0.0 | 51.5 | - | - | - |
| 33 | D+FD+CG+L+<W2+FL | 0.2 | -0.0 | 51.0 | -9.5 | 0.0 | 56.2 | - | - | - |
| 34 | D+FD+CG+S+W1>+FL | 5.6 | -0.0 | 41.1 | 4.7 | 0.0 | 37.4 | - | - | - |
| 35 | D+FD+CG+S+<W1+FL | -3.5 | -0.0 | 36.5 | -7.5 | 0.0 | 42.1 | - | - | - |
| 36 | D+FD+CG+S+W2>+FL | 6.0 | -0.0 | 46.2 | 5.9 | 0.0 | 41.9 | - | - | - |
| 37 | D+FD+CG+S+<W2+FL | -3.0 | -0.0 | 41.7 | -6.3 | 0.0 | 46.6 | - | - | - |
| 38 | D + FD + CG + FL | 3.0 | -0.0 | 45.9 | -3.0 | 0.0 | 47.0 | - | - | - |
| 39 | D + FD + CG + E> + EG+ | 4.5 | -0.0 | 26.8 | -0.8 | 0.0 | 25.7 | - | - | - |
| 40 | D + FD + CG + <E + EG+ | 1.0 | -0.0 | 24.8 | -4.7 | 0.0 | 27.7 | - | - | - |
| 41 | D + FD + CU + E> + EG- | 2.5 | -0.0 | 13.7 | 1.1 | 0.0 | 12.2 | - | - | - |
| 42 | D + FD + CU + <E + EG- | -0.9 | -0.0 | 11.8 | -2.8 | 0.0 | 14.2 | - | - | - |
| 43 | D + FD + CG + E> + EG+ | 4.0 | -0.0 | 26.5 | -1.3 | 0.0 | 25.8 | - | - | - |
| 44 | D + FD + CG + <E + EG+ | 1.5 | -0.0 | 25.0 | -4.2 | 0.0 | 27.3 | - | - | - |
| 45 | D+FD+CG+E>+EG++FL | 4.4 | -0.0 | 47.0 | -1.6 | 0.0 | 46.6 | - | - | - |
| 46 | D+FD+CG+<E+EG++FL | 1.8 | -0.0 | 45.5 | -4.5 | 0.0 | 48.1 | - | - | - |
| 47 | D + FD + CG + WP + WB1> | 2.1 | -5.1 | 34.9 | -6.9 | 5.0 | 37.2 | - | - | - |
| 48 | D + FD + CU + WP + WB1> | 0.3 | -5.1 | 22.6 | -5.1 | 5.0 | 24.5 | - | - | - |
| 49 | D+FD+CG+L+WP+WB1> | 6.0 | -3.8 | 43.1 | -9.6 | 3.8 | 45.3 | - | - | - |
| 50 | D+FD+CG+S+WP+WB1> | 2.7 | -3.8 | 33.8 | -6.3 | 3.8 | 35.7 | - | - | - |
| 51 | D+FD+CG+L+WP+FL+WB1> | 6.3 | -3.8 | 63.6 | -9.9 | 3.8 | 66.0 | - | - | - |
| 52 | D+FD+CG+S+WP+FL+WB1> | 3.0 | -3.8 | 54.3 | -6.6 | 3.8 | 56.4 | - | - | - |
| 53 | D + FD + CG + WP + <WB1 | 2.6 | 5.0 | -9.1 | -7.4 | -5.1 | -5.9 | - | - | - |
| 54 | D + FD + CU + WP + <WB1 | 0.8 | 5.0 | -21.3 | -5.5 | -5.1 | -18.6 | - | - | - |
| 55 | D+FD+CG+L+WP+<WB1 | 6.3 | 3.7 | 10.1 | -9.9 | -3.8 | 13.0 | - | - | - |
| 56 | D+FD+CG+S+WP+<WB1 | 3.1 | 3.7 | 0.8 | -6.6 | -3.8 | 3.4 | - | - | - |
| 57 | D+FD+CG+L+WP+FL+<WB1 | 6.7 | 3.7 | 30.6 | -10.2 | -3.8 | 33.7 | - | - | - |
| 58 | D+FD+CG+S+WP+FL+<WB1 | 3.4 | 3.7 | 21.3 | -6.9 | -3.8 | 24.1 | - | - | - |
| 59 | D + FD + CG + WP + WB2> | 2.1 | -6.0 | 38.8 | -6.9 | 5.9 | 41.0 | - | - | - |
| 60 | D + FD + CU + WP + WB2> | 0.3 | -6.0 | 26.5 | -5.0 | 5.9 | 28.3 | - | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 61 | D+FD+CG+L+WP+WB2> | 6.0 | -4.5 | 46.0 | -9.5 | 4.5 | 48.2 | - | - | - |
| 62 | D+FD+CG+S+WP+WB2> | 2.7 | -4.5 | 36.7 | -6.2 | 4.5 | 38.6 | - | - | - |
| 63 | D+FD+CG+L+WP+FL+WB2> | 6.3 | -4.5 | 66.5 | -9.9 | 4.5 | 68.9 | - | - | - |
| 64 | D+FD+CG+S+WP+FL+WB2> | 3.0 | -4.5 | 57.2 | -6.6 | 4.5 | 59.3 | - | - | - |
| 65 | D + FD + CG + WP + <WB2 | 2.6 | 4.1 | -5.2 | -7.3 | -4.2 | -2.2 | - | - | - |
| 66 | D + FD + CU + WP + <WB2 | 0.7 | 4.2 | -17.5 | -5.5 | -4.2 | -14.8 | - | - | - |
| 67 | D+FD+CG+L+WP+<WB2 | 6.3 | 3.1 | 13.0 | -9.9 | -3.1 | 15.8 | - | - | - |
| 68 | D+FD+CG+S+WP+<WB2 | 3.0 | 3.1 | 3.7 | -6.6 | -3.1 | 6.2 | - | - | - |
| 69 | D+FD+CG+L+WP+FL+<WB2 | 6.6 | 3.1 | 33.5 | -10.2 | -3.1 | 36.5 | - | - | - |
| 70 | D+FD+CG+S+WP+FL+<WB2 | 3.3 | 3.1 | 24.2 | -6.9 | -3.1 | 26.9 | - | - | - |
| 71 | D + FD + CG + EB> + EG+ | 2.7 | -1.2 | 30.8 | -2.7 | 1.2 | 31.7 | - | - | - |
| 72 | D + FD + CU + EB> + EG- | 0.8 | -1.2 | 17.7 | -0.8 | 1.2 | 18.2 | - | - | - |
| 73 | D + FD + CG + EB> + EG+ | 2.7 | -0.9 | 29.4 | -2.7 | 0.9 | 30.3 | - | - | - |
| 74 | D+FD+CG+EB>+EG++FL | 3.0 | -0.9 | 50.0 | -3.0 | 0.9 | 51.0 | - | - | - |
| 75 | D + FD + CG + <EB + EG+ | 2.8 | 1.1 | 20.8 | -2.8 | -1.1 | 21.7 | - | - | - |
| 76 | D + FD + CU + <EB + EG- | 0.9 | 1.1 | 7.8 | -0.9 | -1.1 | 8.2 | - | - | - |
| 77 | D + FD + CG + <EB + EG+ | 2.8 | 0.8 | 22.0 | -2.8 | -0.8 | 22.8 | - | - | - |
| 78 | D+FD+CG+<EB+EG++FL | 3.1 | 0.8 | 42.5 | -3.1 | -0.8 | 43.6 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | AJ-A4 | 8.4 | 14 | 9.3 | 32 | 6.0 | 59 | 5.0 | 54 | 21.3 | 54 | 66.5 | 63 | - | - | - | - |
| 58/0/0 | AJ-A1 | 10.7 | 31 | 11.6 | 15 | 5.1 | 54 | 5.9 | 59 | 18.6 | 54 | 68.9 | 63 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | A4-AJ | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |
| 58/0/0 | A1-AJ | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

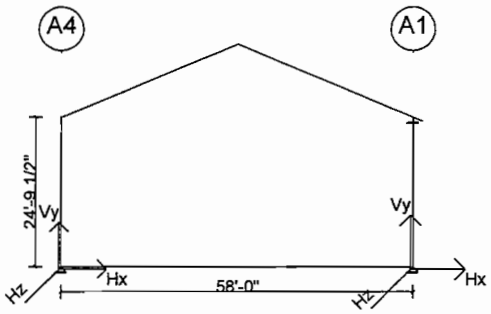
**Wall: 4, Frame at: 95/8/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 L> | D + FD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <L | D + FD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S> | D + FD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <S | D + FD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SD | D + FD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 S + 1.0 SS | D + FD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 US1* | D + FD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 *US1 | D + FD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W1> | D + FD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W1 | D + FD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 W2> | D + FD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 <W2 | D + FD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 WP | D + FD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W1> | D + FD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W1 | D + FD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 W2> | D + FD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 <W2 | D + FD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 1.0 WP | D + FD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 1.0 FL | D + FD + CG + FL |
| 20 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG | D + FD + CG |
| 21 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> | D + FD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 | D + FD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> | D + FD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 | D + FD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP | D + FD + CG + L + WP |
| 26 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> | D + FD + CG + S + W1> |
| 27 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 | D + FD + CG + S + <W1 |
| 28 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> | D + FD + CG + S + W2> |
| 29 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 | D + FD + CG + S + <W2 |
| 30 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP | D + FD + CG + S + WP |
| 31 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L> + 0.750 FL | D + FD + CG + L> + FL |
| 32 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 <L + 0.750 FL | D + FD + CG + <L + FL |
| 33 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 FL | D + FD + CG + S + FL |
| 34 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W1> + 0.750 FL | D+FD+CG+L+W1>+FL |
| 35 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W1 + 0.750 FL | D+FD+CG+L+<W1+FL |
| 36 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 W2> + 0.750 FL | D+FD+CG+L+W2>+FL |
| 37 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 <W2 + 0.750 FL | D+FD+CG+L+<W2+FL |
| 38 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 FL | D+FD+CG+L+WP+FL |
| 39 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W1> + 0.750 FL | D+FD+CG+S+W1>+FL |
| 40 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W1 + 0.750 FL | D+FD+CG+S+<W1+FL |
| 41 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 W2> + 0.750 FL | D+FD+CG+S+W2>+FL |
| 42 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 <W2 + 0.750 FL | D+FD+CG+S+<W2+FL |
| 43 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 FL | D+FD+CG+S+WP+FL |
| 44 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.750 FL | D + FD + CG + FL |
| 45 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + FD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + FD + CG + <E + EG+ |
| 47 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 E> + 0.700 EG- | D + FD + CU + E> + EG- |
| 48 | System | 1.000 | 0.600 D + 0.600 FD + 0.600 CU + 0.700 <E + 0.700 EG- | D + FD + CU + <E + EG- |
| 49 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + FD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + FD + CG + <E + EG+ |
| 51 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 E> + 0.525 EG+ + 0.750 FL | D+FD+CG+E>+EG++FL |
| 52 | System | 1.000 | 1.0 D + 1.0 FD + 1.0 CG + 0.525 <E + 0.525 EG+ + 0.750 FL | D+FD+CG+<E+EG++FL |

**Wall: 4, Frame at: 95/8/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: AF**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
| Grid1 - Grid2 | | AF-A4 | | AF-A1 | | | | |
| Base Plate W x L (in.) | | 10 x 13 | | 10 x 18 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.3 | 4.4 | -1.3 | 4.8 | - | - | - |
| FD | Frm | 0.2 | 15.0 | -0.2 | 15.0 | - | - | - |
| CG | Frm | 1.3 | 3.4 | -1.3 | 3.6 | - | - | - |
| L> | Frm | 5.1 | 13.6 | -5.1 | 14.4 | - | - | - |
| <L | Frm | 5.1 | 13.6 | -5.1 | 14.4 | - | - | - |
| S> | Frm | 0.6 | 1.6 | -0.6 | 1.7 | - | - | - |
| <S | Frm | 0.6 | 1.6 | -0.6 | 1.7 | - | - | - |
| S | Frm | 0.6 | 1.6 | -0.6 | 1.7 | - | - | - |
| SD | Frm | 0.0 | 1.5 | -0.0 | 0.1 | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | 0.8 | 1.9 | -0.8 | 1.3 | - | - | - |
| *US1 | Frm | 0.7 | 1.2 | -0.7 | 2.0 | - | - | - |
| W1> | Frm | -1.5 | -9.0 | 9.9 | -13.2 | - | - | - |
| <W1 | Frm | -6.0 | -12.6 | -4.6 | -9.0 | - | - | - |
| W2> | Frm | 1.6 | -1.5 | 12.1 | -7.9 | - | - | - |
| <W2 | Frm | -3.0 | -5.1 | -2.4 | -3.8 | - | - | - |
| WP | Frm | -5.9 | -13.9 | -5.6 | -9.4 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| FL | Frm | 0.4 | 27.4 | -0.4 | 27.6 | - | - | - |
| L | Frm | 5.1 | 13.6 | -5.1 | 14.4 | - | - | - |
| E> | Frm | 2.2 | 1.4 | 2.7 | -1.4 | - | - | - |
| EG+ | Frm | 0.1 | 0.6 | -0.1 | 0.6 | - | - | - |
| <E | Frm | -2.2 | -1.4 | -2.7 | 1.4 | - | - | - |
| EG- | Frm | -0.1 | -0.6 | 0.1 | -0.6 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: AF**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 58/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | AF-A4 | | AF-A1 | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |

| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | D + FD + CG + L> | 7.8 | 36.3 | -7.8 | 37.9 | - | - | - |
| 2 | D + FD + CG + <L | 7.8 | 36.3 | -7.8 | 37.9 | - | - | - |
| 3 | D + FD + CG + S> | 3.3 | 24.3 | -3.3 | 25.2 | - | - | - |
| 4 | D + FD + CG + <S | 3.3 | 24.3 | -3.3 | 25.2 | - | - | - |
| 5 | D + FD + CG + S + SD | 3.4 | 25.8 | -3.4 | 25.2 | - | - | - |
| 6 | D + FD + CG + S + SS | 3.3 | 24.3 | -3.3 | 25.2 | - | - | - |
| 7 | D + FD + CG + US1* | 3.5 | 24.6 | -3.5 | 24.8 | - | - | - |
| 8 | D + FD + CG + *US1 | 3.5 | 23.9 | -3.5 | 25.5 | - | - | - |
| 9 | D + FD + CG + W1> | 1.3 | 13.7 | 7.1 | 10.3 | - | - | - |
| 10 | D + FD + CG + <W1 | -3.3 | 10.1 | -7.4 | 14.5 | - | - | - |
| 11 | D + FD + CG + W2> | 4.3 | 21.2 | 9.4 | 15.6 | - | - | - |
| 12 | D + FD + CG + <W2 | -0.2 | 17.6 | -5.1 | 19.7 | - | - | - |
| 13 | D + FD + CG + WP | -3.1 | 8.8 | -8.3 | 14.0 | - | - | - |
| 14 | D + FD + CU + W1> | -0.6 | 2.6 | 9.0 | -1.2 | - | - | - |
| 15 | D + FD + CU + <W1 | -5.1 | -1.0 | -5.5 | 2.9 | - | - | - |
| 16 | D + FD + CU + W2> | 2.5 | 10.1 | 11.2 | 4.0 | - | - | - |
| 17 | D + FD + CU + <W2 | -2.1 | 6.5 | -3.3 | 8.2 | - | - | - |
| 18 | D + FD + CU + WP | -5.0 | -2.3 | -6.5 | 2.5 | - | - | - |
| 19 | D + FD + CG + FL | 3.2 | 50.2 | -3.2 | 51.0 | - | - | - |
| 20 | D + FD + CG | 2.8 | 22.7 | -2.8 | 23.5 | - | - | - |
| 21 | D + FD + CG + L + W1> | 5.4 | 26.1 | 0.9 | 24.4 | - | - | - |
| 22 | D + FD + CG + L + <W1 | 2.0 | 23.4 | -10.0 | 27.5 | - | - | - |
| 23 | D + FD + CG + L + W2> | 7.7 | 31.7 | 2.5 | 28.4 | - | - | - |
| 24 | D + FD + CG + L + <W2 | 4.3 | 29.1 | -8.4 | 31.5 | - | - | - |
| 25 | D + FD + CG + L + WP | 2.2 | 22.4 | -10.7 | 27.2 | - | - | - |
| 26 | D + FD + CG + S + W1> | 2.1 | 17.1 | 4.2 | 14.9 | - | - | - |
| 27 | D + FD + CG + S + <W1 | -1.3 | 14.4 | -6.7 | 18.0 | - | - | - |
| 28 | D + FD + CG + S + W2> | 4.4 | 22.8 | 5.9 | 18.8 | - | - | - |
| 29 | D + FD + CG + S + <W2 | 1.0 | 20.1 | -5.0 | 21.9 | - | - | - |
| 30 | D + FD + CG + S + WP | -1.2 | 13.4 | -7.4 | 17.7 | - | - | - |
| 31 | D + FD + CG + L> + FL | 6.9 | 53.5 | -6.9 | 55.0 | - | - | - |
| 32 | D + FD + CG + <L + FL | 6.9 | 53.5 | -6.9 | 55.0 | - | - | - |
| 33 | D + FD + CG + S + FL | 3.5 | 44.5 | -3.5 | 45.4 | - | - | - |
| 34 | D+FD+CG+L+W1>+FL | 5.7 | 46.7 | 0.6 | 45.1 | - | - | - |
| 35 | D+FD+CG+L+<W1+FL | 2.4 | 44.0 | -10.3 | 48.2 | - | - | - |
| 36 | D+FD+CG+L+W2>+FL | 8.0 | 52.3 | 2.2 | 49.0 | - | - | - |
| 37 | D+FD+CG+L+<W2+FL | 4.7 | 49.6 | -8.7 | 52.1 | - | - | - |
| 38 | D+FD+CG+L+WP+FL | 2.5 | 43.0 | -11.0 | 47.9 | - | - | - |
| 39 | D+FD+CG+S+W1>+FL | 2.4 | 37.7 | 3.9 | 35.5 | - | - | - |
| 40 | D+FD+CG+S+<W1+FL | -1.0 | 35.0 | -7.0 | 38.7 | - | - | - |
| 41 | D+FD+CG+S+W2>+FL | 4.7 | 43.3 | 5.6 | 39.5 | - | - | - |
| 42 | D+FD+CG+S+<W2+FL | 1.3 | 40.7 | -5.3 | 42.6 | - | - | - |
| 43 | D+FD+CG+S+WP+FL | -0.9 | 34.0 | -7.7 | 38.3 | - | - | - |
| 44 | D + FD + CG + FL | 3.1 | 43.3 | -3.1 | 44.1 | - | - | - |
| 45 | D + FD + CG + E> + EG+ | 4.3 | 24.1 | -0.9 | 22.9 | - | - | - |
| 46 | D + FD + CG + <E + EG+ | 1.3 | 22.2 | -4.7 | 24.9 | - | - | - |
| 47 | D + FD + CU + E> + EG- | 2.4 | 12.2 | 1.1 | 10.6 | - | - | - |
| 48 | D + FD + CU + <E + EG- | -0.7 | 10.2 | -2.8 | 12.5 | - | - | - |
| 49 | D + FD + CG + E> + EG+ | 3.9 | 23.7 | -1.4 | 23.1 | - | - | - |
| 50 | D + FD + CG + <E + EG+ | 1.7 | 22.3 | -4.2 | 24.5 | - | - | - |
| 51 | D+FD+CG+E>+EG++FL | 4.3 | 44.3 | -1.7 | 43.7 | - | - | - |
| 52 | D+FD+CG+<E+EG++FL | 2.0 | 42.9 | -4.5 | 45.2 | - | - | - |

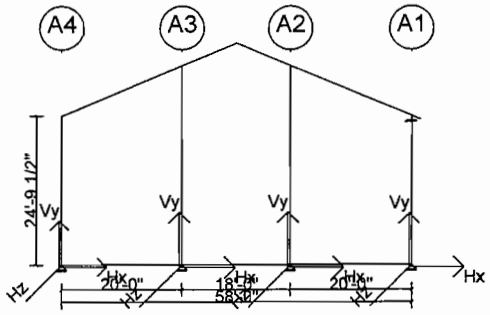
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | AF-A4 | 5.1 | 15 | 8.0 | 36 | - | - | - | - | 2.3 | 18 | 53.5 | 31 | - | - | - | - |
| 58/0/0 | AF-A1 | 11.0 | 38 | 11.2 | 16 | - | - | - | - | 1.2 | 14 | 55.0 | 31 | - | - | - | - |

**Wall: 4, Frame at: 119/2/0**
Frame ID:CB2 End

Frame Type:Continuous Beam




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: AD**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Exterior Column | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
| Grid1 - Grid2 | | AD-A4 | | AD-A3 | | | AD-A2 | | | AD-A1 | | |
| Base Plate W x L (in.) | | 9 x 16 | | 9 x 11 | | | 9 x 11 | | | 10 x 13 | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | 100'-0" | | | 100'-0" | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |
| D | Frm | 0.1 | 2.1 | - | -0.0 | 3.4 | - | -0.0 | 3.5 | -0.1 | 2.7 | - |
| FD | Frm | 0.1 | 15.1 | - | - | -0.2 | - | - | 0.3 | -0.1 | 14.7 | - |
| CG | Frm | 0.0 | 1.4 | - | -0.0 | 2.5 | - | -0.0 | 2.5 | -0.0 | 1.6 | - |
| L> | Frm | 0.2 | 5.7 | - | -0.1 | 10.1 | - | -0.1 | 10.2 | -0.2 | 6.5 | - |
| <L | Frm | 0.2 | 5.7 | - | -0.1 | 10.1 | - | -0.1 | 10.2 | -0.2 | 6.5 | - |
| S> | Frm | 0.0 | 0.7 | - | - | 1.2 | - | - | 1.2 | -0.0 | 0.8 | - |
| <S | Frm | 0.0 | 0.7 | - | - | 1.2 | - | - | 1.2 | -0.0 | 0.8 | - |
| S | Frm | 0.0 | 0.7 | - | - | 1.2 | - | - | 1.2 | -0.0 | 0.8 | - |
| SD | Frm | 0.0 | 3.0 | - | -0.0 | 3.1 | - | -0.0 | 3.0 | -0.0 | 1.9 | - |
| SS | Frm | - | - | - | - | - | - | - | - | - | - | - |
| US1* | Frm | - | 0.2 | - | - | 1.1 | - | - | 0.6 | - | 0.0 | - |
| *US1 | Frm | - | 0.0 | - | - | 0.5 | - | - | 1.2 | - | 0.3 | - |
| W1> | Frm | 0.6 | -2.8 | - | 1.0 | -10.8 | - | 1.0 | -3.7 | 5.4 | -8.0 | - |
| <W1 | Frm | -1.3 | -7.3 | - | 0.7 | -2.7 | - | 0.7 | -11.3 | -6.4 | -2.4 | - |
| W2> | Frm | 1.3 | 0.6 | - | -0.2 | -9.1 | - | -0.2 | 2.2 | 9.1 | -7.7 | - |
| <W2 | Frm | -0.6 | -3.8 | - | 0.5 | -1.1 | - | 0.5 | -5.4 | -2.8 | -2.1 | - |
| WP | Frm | -1.6 | -8.4 | - | -1.3 | -3.8 | - | -1.2 | -13.1 | -7.9 | -2.2 | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - |
| FL | Frm | 0.1 | 27.7 | - | - | -0.4 | - | - | 0.6 | -0.1 | 27.0 | - |
| L | Frm | 0.2 | 5.7 | - | -0.1 | 10.1 | - | -0.1 | 10.2 | -0.2 | 6.5 | - |
| E> | Frm | 1.1 | 0.8 | - | 0.2 | -1.1 | - | 0.2 | 3.7 | 2.9 | -2.8 | - |
| EG+ | Frm | - | 0.5 | - | - | 0.1 | - | - | 0.2 | - | 0.5 | - |
| <E | Frm | -1.1 | -0.8 | - | -0.2 | 1.1 | - | -0.2 | -3.7 | -2.9 | 2.8 | - |
| EG- | Frm | - | -0.5 | - | - | -0.1 | - | - | -0.2 | - | -0.5 | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: AD**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 20/0/0 | | | 38/0/0 | | | 58/0/0 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | AD-A4 | | AD-A3 | | | AD-A2 | | | AD-A1 | | |
| Ld | Description | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | |

| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | D + FD + CG + L> | 0.3 | 24.4 | - | -0.1 | 15.7 | - | -0.1 | 16.5 | -0.3 | 25.6 | - |
| 2 | D + FD + CG + <L | 0.3 | 24.4 | - | -0.1 | 15.7 | - | -0.1 | 16.5 | -0.3 | 25.6 | - |
| 3 | D + FD + CG + S> | 0.2 | 19.4 | - | -0.0 | 6.9 | - | -0.0 | 7.6 | -0.2 | 19.9 | - |
| 4 | D + FD + CG + <S | 0.2 | 19.4 | - | -0.0 | 6.9 | - | -0.0 | 7.6 | -0.2 | 19.9 | - |
| 5 | D + FD + CG + S + SD | 0.2 | 22.4 | - | -0.1 | 10.0 | - | -0.1 | 10.5 | -0.2 | 21.8 | - |
| 6 | D + FD + CG + S + SS | 0.2 | 19.4 | - | -0.0 | 6.9 | - | -0.0 | 7.6 | -0.2 | 19.9 | - |
| 7 | D + FD + CG + US1* | 0.2 | 18.9 | - | -0.0 | 6.8 | - | -0.0 | 6.9 | -0.2 | 19.1 | - |
| 8 | D + FD + CG + *US1 | 0.2 | 18.7 | - | -0.0 | 6.1 | - | -0.0 | 7.5 | -0.2 | 19.4 | - |
| 9 | D + FD + CG + W1> | 0.8 | 15.9 | - | 1.0 | -5.1 | - | 1.0 | 2.6 | 5.2 | 11.1 | - |
| 10 | D + FD + CG + <W1 | -1.1 | 11.4 | - | 0.6 | 3.0 | - | 0.6 | -5.0 | -6.6 | 16.7 | - |
| 11 | D + FD + CG + W2> | 1.5 | 19.3 | - | -0.2 | -3.5 | - | -0.2 | 8.5 | 8.9 | 11.4 | - |
| 12 | D + FD + CG + <W2 | -0.4 | 14.8 | - | 0.4 | 4.6 | - | 0.4 | 0.9 | -2.9 | 17.0 | - |
| 13 | D + FD + CG + WP | -1.4 | 10.3 | - | -1.3 | 1.8 | - | -1.3 | -6.8 | -8.1 | 16.9 | - |
| 14 | D + FD + CU + W1> | 0.7 | 7.6 | - | 1.0 | -8.9 | - | 1.0 | -1.5 | 5.3 | 2.5 | - |
| 15 | D + FD + CU + <W1 | -1.2 | 3.1 | - | 0.7 | -0.8 | - | 0.7 | -9.1 | -6.5 | 8.0 | - |
| 16 | D + FD + CU + W2> | 1.4 | 11.0 | - | -0.2 | -7.3 | - | -0.2 | 4.5 | 9.0 | 2.8 | - |
| 17 | D + FD + CU + <W2 | -0.5 | 6.5 | - | 0.5 | 0.8 | - | 0.5 | -3.1 | -2.8 | 8.4 | - |
| 18 | D + FD + CU + WP | -1.5 | 2.0 | - | -1.3 | -1.9 | - | -1.3 | -10.8 | -8.0 | 8.3 | - |
| 19 | D + FD + CG + FL | 0.3 | 46.4 | - | -0.0 | 5.3 | - | -0.0 | 7.0 | -0.3 | 46.1 | - |
| 20 | D + FD + CG | 0.2 | 18.7 | - | -0.0 | 5.7 | - | -0.0 | 6.3 | -0.2 | 19.1 | - |
| 21 | D + FD + CG + L + W1> | 0.8 | 20.9 | - | 0.7 | 5.1 | - | 0.7 | 11.1 | 3.8 | 18.0 | - |
| 22 | D + FD + CG + L + <W1 | -0.7 | 17.5 | - | 0.4 | 11.2 | - | 0.4 | 5.4 | -5.1 | 22.2 | - |
| 23 | D + FD + CG + L + W2> | 1.3 | 23.4 | - | -0.2 | 6.3 | - | -0.2 | 15.6 | 6.5 | 18.3 | - |
| 24 | D + FD + CG + L + <W2 | -0.2 | 20.1 | - | 0.3 | 12.4 | - | 0.3 | 9.9 | -2.4 | 22.4 | - |
| 25 | D + FD + CG + L + WP | -0.9 | 16.7 | - | -1.0 | 10.3 | - | -1.0 | 4.1 | -6.2 | 22.4 | - |
| 26 | D + FD + CG + S + W1> | 0.6 | 17.1 | - | 0.7 | -1.5 | - | 0.7 | 4.4 | 3.9 | 13.7 | - |
| 27 | D + FD + CG + S + <W1 | -0.8 | 13.7 | - | 0.5 | 4.5 | - | 0.5 | -1.3 | -5.0 | 17.9 | - |
| 28 | D + FD + CG + S + W2> | 1.2 | 19.7 | - | -0.2 | -0.3 | - | -0.2 | 8.9 | 6.6 | 14.0 | - |
| 29 | D + FD + CG + S + <W2 | -0.3 | 16.3 | - | 0.3 | 5.8 | - | 0.3 | 3.2 | -2.3 | 18.1 | - |
| 30 | D + FD + CG + S + WP | -1.0 | 12.9 | - | -1.0 | 3.7 | - | -1.0 | -2.6 | -6.1 | 18.1 | - |
| 31 | D + FD + CG + L> + FL | 0.4 | 43.8 | - | -0.1 | 12.9 | - | -0.1 | 14.4 | -0.4 | 44.3 | - |
| 32 | D + FD + CG + <L + FL | 0.4 | 43.8 | - | -0.1 | 12.9 | - | -0.1 | 14.4 | -0.4 | 44.3 | - |
| 33 | D + FD + CG + S + FL | 0.3 | 40.0 | - | -0.0 | 6.3 | - | -0.0 | 7.7 | -0.3 | 40.0 | - |
| 34 | D+FD+CG+L+W1>+FL | 0.8 | 41.7 | - | 0.7 | 4.8 | - | 0.7 | 11.6 | 3.7 | 38.3 | - |
| 35 | D+FD+CG+L+<W1+FL | -0.6 | 38.3 | - | 0.4 | 10.9 | - | 0.4 | 5.9 | -5.2 | 42.4 | - |
| 36 | D+FD+CG+L+W2>+FL | 1.4 | 44.3 | - | -0.2 | 6.1 | - | -0.2 | 16.1 | 6.4 | 38.5 | - |
| 37 | D+FD+CG+L+<W2+FL | -0.1 | 40.9 | - | 0.3 | 12.1 | - | 0.3 | 10.4 | -2.5 | 42.7 | - |
| 38 | D+FD+CG+L+WP+FL | -0.8 | 37.5 | - | -1.0 | 10.0 | - | -1.0 | 4.6 | -6.3 | 42.6 | - |
| 39 | D+FD+CG+S+W1>+FL | 0.7 | 37.9 | - | 0.7 | -1.8 | - | 0.7 | 4.9 | 3.8 | 34.0 | - |
| 40 | D+FD+CG+S+<W1+FL | -0.7 | 34.6 | - | 0.5 | 4.2 | - | 0.5 | -0.8 | -5.1 | 38.1 | - |
| 41 | D+FD+CG+S+W2>+FL | 1.3 | 40.5 | - | -0.2 | -0.6 | - | -0.2 | 9.4 | 6.5 | 34.2 | - |
| 42 | D+FD+CG+S+<W2+FL | -0.2 | 37.1 | - | 0.3 | 5.5 | - | 0.3 | 3.7 | -2.3 | 38.4 | - |
| 43 | D+FD+CG+S+WP+FL | -0.9 | 33.7 | - | -1.0 | 3.4 | - | -1.0 | -2.1 | -6.2 | 38.3 | - |
| 44 | D + FD + CG + FL | 0.2 | 39.5 | - | -0.0 | 5.4 | - | -0.0 | 6.8 | -0.2 | 39.3 | - |
| 45 | D + FD + CG + E> + EG+ | 0.9 | 19.5 | - | 0.1 | 5.0 | - | 0.1 | 9.0 | 1.9 | 17.5 | - |
| 46 | D + FD + CG + <E + EG+ | -0.6 | 18.5 | - | -0.2 | 6.5 | - | -0.2 | 3.9 | -2.2 | 21.4 | - |
| 47 | D + FD + CU + E> + EG- | 0.8 | 10.6 | - | 0.1 | 1.0 | - | 0.1 | 4.8 | 2.0 | 8.2 | - |
| 48 | D + FD + CU + <E + EG- | -0.7 | 9.5 | - | -0.2 | 2.6 | - | -0.1 | -0.4 | -2.1 | 12.1 | - |
| 49 | D + FD + CG + E> + EG+ | 0.7 | 19.3 | - | 0.1 | 5.2 | - | 0.1 | 8.4 | 1.4 | 17.9 | - |
| 50 | D + FD + CG + <E + EG+ | -0.4 | 18.5 | - | -0.1 | 6.3 | - | -0.1 | 4.5 | -1.7 | 20.8 | - |
| 51 | D+FD+CG+E>+EG++FL | 0.8 | 40.1 | - | 0.1 | 4.9 | - | 0.1 | 8.8 | 1.3 | 38.1 | - |
| 52 | D+FD+CG+<E+EG++FL | -0.3 | 39.3 | - | -0.1 | 6.0 | - | -0.1 | 5.0 | -1.8 | 41.1 | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | AD-A4 | 1.5 | 18 | 1.5 | 11 | - | - | - | - | - | - | 46.4 | 19 | - | - | - | - |
| 20/0/0 | AD-A3 | - | - | - | - | 1.3 | 13 | 1.0 | 14 | 8.9 | 14 | 15.7 | 1 | - | - | - | - |
| 38/0/0 | AD-A2 | - | - | - | - | 1.3 | 13 | 1.0 | 14 | 10.8 | 18 | 16.5 | 1 | - | - | - | - |
| 58/0/0 | AD-A1 | 8.1 | 13 | 9.0 | 16 | - | - | - | - | - | - | 46.1 | 19 | - | - | - | - |

## Shape: Operations Building Lean-to

**Loads and Codes - Shape: Operations Building Lean-to**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.602)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 8/9/11
Parts / Portions Zone Strip Width: 7/0/9
Basic Wind Pressure: 22.13,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

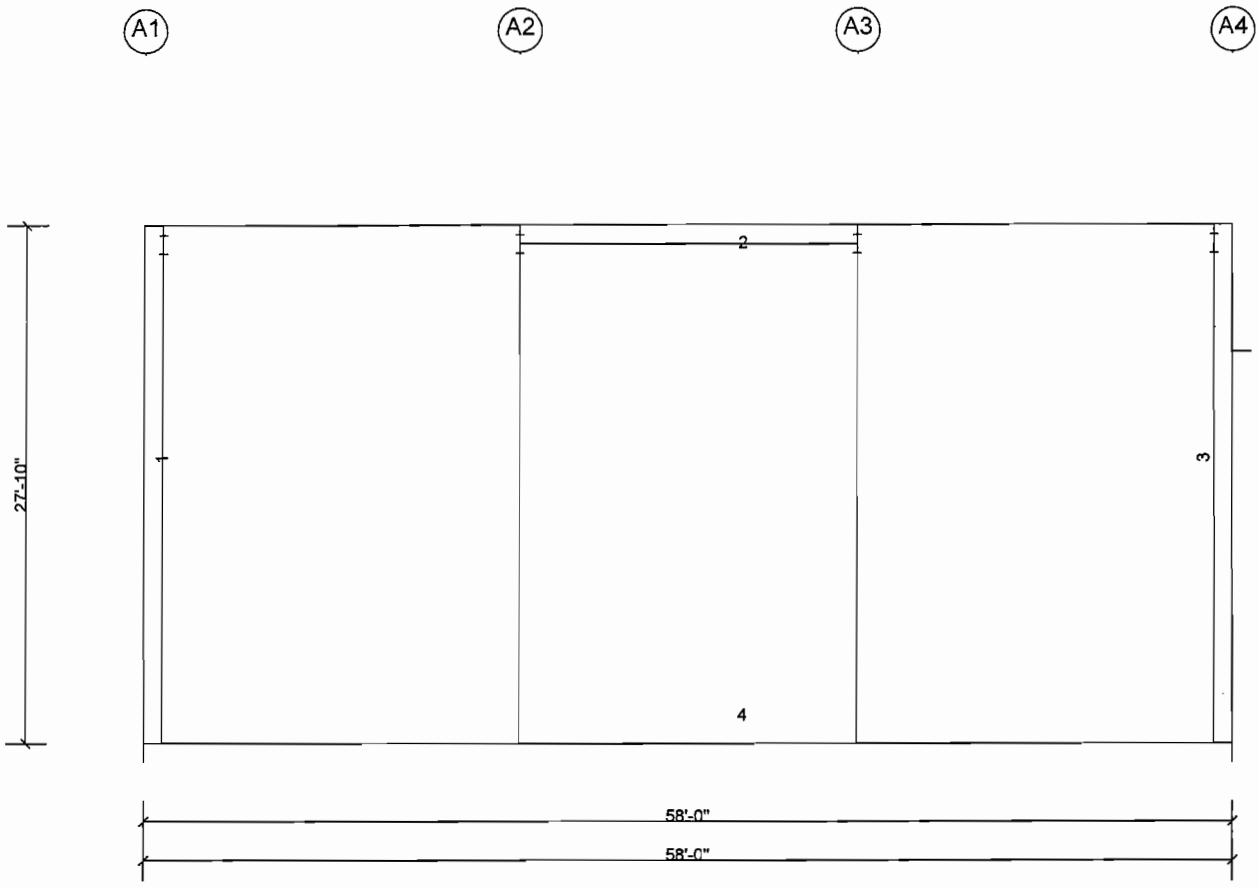
**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.2778
Bracing Seismic Period: 0.1719
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | A1- | A1-AM | 27/10/0 | 58/0/0 | 12/11/11 | 22/3/0 | 4.000:12 | | | |


A1
A2
A3
A4
27'-10"
1
2
3
4
58'-0"
58'-0"

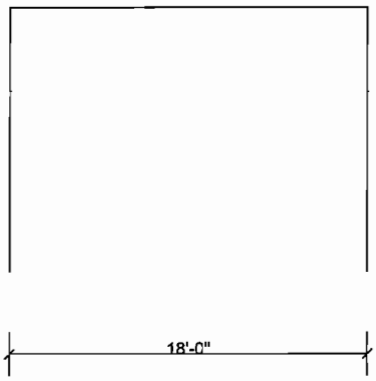
## Wall: 2

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SS | D + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Wall: 2**
Frame ID:Portal Frame

Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

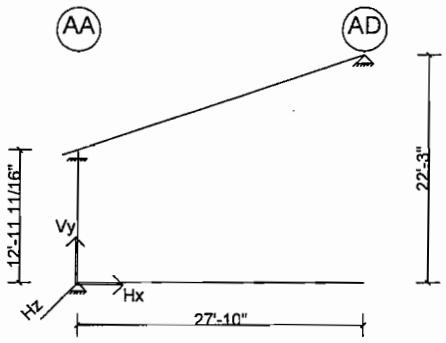
**Wall: 2, Frame at: 1/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SS | D + CG + S + SS |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Wall: 2, Frame at: 1/0/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A4**

| Type | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | |
| Grid1 - Grid2 | | A4-AA | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Vy | | | | |
| D | Frm | - | 1.3 | - | - | - | - |
| CG | Frm | - | 0.9 | - | - | - | - |
| L> | Frm | - | 3.7 | - | - | - | - |
| <L | Frm | - | 3.7 | - | - | - | - |
| S> | Frm | - | 0.5 | - | - | - | - |
| <S | Frm | - | 0.5 | - | - | - | - |
| S | Frm | - | 0.5 | - | - | - | - |
| SD | Frm | - | 1.0 | - | - | - | - |
| SS | Frm | - | - | - | - | - | - |
| W1> | Frm | 0.8 | -2.7 | - | - | - | - |
| <W1 | Frm | -0.7 | -3.2 | - | - | - | - |
| W2> | Frm | 0.3 | -1.2 | - | - | - | - |
| <W2 | Frm | -1.2 | -1.7 | - | - | - | - |
| WP | Frm | 1.1 | -3.8 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| L | Frm | - | 3.7 | - | - | - | - |
| E> | Frm | 0.1 | -0.1 | - | - | - | - |
| EG+ | Frm | - | 0.0 | - | - | - | - |
| <E | Frm | -0.1 | 0.1 | - | - | - | - |
| EG- | Frm | - | -0.0 | - | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A4**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | | | | |
|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | A4-AA | | | | | |
| Ld | Description | Hx | Vy | | | | |
| Cs | (application factor not shown) | (k) | (k) | | | | |
| 1 | D + CG + L> | - | 5.8 | - | - | - | - |
| 2 | D + CG + <L | - | 5.8 | - | - | - | - |
| 3 | D + CG + S> | - | 2.7 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | - | 2.7 | - | - | - | - |
| 5 | D + CG + S + SD | - | 3.6 | - | - | - | - |
| 6 | D + CG + S + SS | - | 2.7 | - | - | - | - |
| 9 | D + CG + W1> | 0.8 | -0.6 | - | - | - | - |
| 10 | D + CG + <W1 | -0.7 | -1.0 | - | - | - | - |
| 11 | D + CG + W2> | 0.3 | 1.0 | - | - | - | - |
| 12 | D + CG + <W2 | -1.2 | 0.5 | - | - | - | - |
| 13 | D + CG + WP | 1.1 | -1.6 | - | - | - | - |
| 14 | D + CU + W1> | 0.8 | -2.0 | - | - | - | - |
| 15 | D + CU + <W1 | -0.7 | -2.5 | - | - | - | - |
| 16 | D + CU + W2> | 0.3 | -0.5 | - | - | - | - |
| 17 | D + CU + <W2 | -1.2 | -0.9 | - | - | - | - |
| 18 | D + CU + WP | 1.1 | -3.0 | - | - | - | - |
| 19 | D + CG + L + W1> | 0.6 | 2.9 | - | - | - | - |
| 20 | D + CG + L + <W1 | -0.5 | 2.5 | - | - | - | - |
| 21 | D + CG + L + W2> | 0.3 | 4.0 | - | - | - | - |
| 22 | D + CG + L + <W2 | -0.9 | 3.7 | - | - | - | - |
| 23 | D + CG + L + WP | 0.8 | 2.1 | - | - | - | - |
| 24 | D + CG + S + W1> | 0.6 | 0.5 | - | - | - | - |
| 25 | D + CG + S + <W1 | -0.5 | 0.1 | - | - | - | - |
| 26 | D + CG + S + W2> | 0.3 | 1.6 | - | - | - | - |
| 27 | D + CG + S + <W2 | -0.9 | 1.3 | - | - | - | - |
| 28 | D + CG + S + WP | 0.8 | -0.3 | - | - | - | - |
| 29 | D + CG + E> + EG+ | 0.1 | 2.2 | - | - | - | - |
| 30 | D + CG + <E + EG+ | -0.1 | 2.3 | - | - | - | - |
| 31 | D + CU + E> + EG- | 0.1 | 0.7 | - | - | - | - |
| 32 | D + CU + <E + EG- | -0.1 | 0.8 | - | - | - | - |
| 33 | D + CG + E> + EG+ | 0.1 | 2.2 | - | - | - | - |
| 34 | D + CG + <E + EG+ | -0.1 | 2.2 | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A4-AA | 1.2 | 12 | 1.1 | 13 | - | - | - | - | 3.0 | 18 | 5.8 | 1 | - | - | - | - |

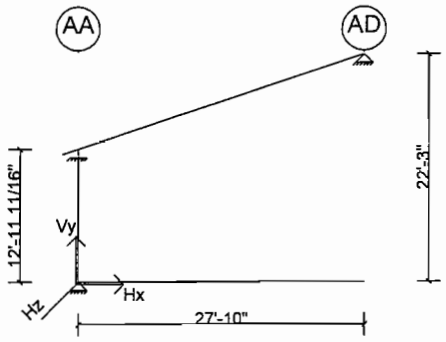
**Wall: 2, Frame at: 20/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SS | D + CG + S + SS |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 28 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 51 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Wall: 2, Frame at: 20/0/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A3**

| Type | | Exterior Column | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | | |
| Grid1 - Grid2 | | A3-AA | | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | | |
| Column Base Elev. | | 100'-0" | | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | | | | |
| D | Frm | -0.0 | 0.0 | 2.5 | - | - | - | - |
| CG | Frm | - | - | 1.5 | - | - | - | - |
| L> | Frm | - | - | 6.1 | - | - | - | - |
| <L | Frm | - | - | 6.1 | - | - | - | - |
| S> | Frm | - | - | 0.8 | - | - | - | - |
| <S | Frm | - | - | 0.8 | - | - | - | - |
| S | Frm | - | - | 0.8 | - | - | - | - |
| SD | Frm | - | - | 0.7 | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| W1> | Frm | 1.5 | - | -4.6 | - | - | - | - |
| <W1 | Frm | -1.2 | - | -4.7 | - | - | - | - |
| W2> | Frm | 0.6 | - | -1.9 | - | - | - | - |
| <W2 | Frm | -2.1 | - | -2.0 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | 6.1 | - | - | - | - |
| E> | Frm | 0.2 | - | -0.1 | - | - | - | - |
| EG+ | Frm | - | - | 0.1 | - | - | - | - |
| <E | Frm | -0.2 | - | 0.1 | - | - | - | - |
| EG- | Frm | - | - | -0.1 | - | - | - | - |
| WP | Frm | 1.9 | - | -5.0 | - | - | - | - |
| WB1> | Brc | -0.1 | 1.9 | 5.3 | - | - | - | - |
| <WB1 | Brc | 0.1 | -2.1 | -6.1 | - | - | - | - |
| WB2> | Brc | -0.1 | 2.9 | 7.9 | - | - | - | - |
| <WB2 | Brc | 0.1 | -1.2 | -3.4 | - | - | - | - |
| EB> | Brc | -0.0 | 0.8 | 2.1 | - | - | - | - |
| <EB | Brc | 0.0 | -0.7 | -2.1 | - | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A3**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | | | | |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | A3-AA | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Hz | Vy | | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | | | | |
| 1 | D + CG + L> | -0.0 | 0.0 | 10.2 | - | - | - | - |
| 2 | D + CG + <L | -0.0 | 0.0 | 10.2 | - | - | - | - |
| 3 | D + CG + S> | -0.0 | 0.0 | 4.9 | - | - | - | - |
| 4 | D + CG + <S | -0.0 | 0.0 | 4.9 | - | - | - | - |
| 5 | D + CG + S + SD | -0.0 | 0.0 | 5.6 | - | - | - | - |
| 6 | D + CG + S + SS | -0.0 | 0.0 | 4.9 | - | - | - | - |
| 9 | D + CG + W1> | 1.5 | 0.0 | -0.5 | - | - | - | - |
| 10 | D + CG + <W1 | -1.2 | 0.0 | -0.7 | - | - | - | - |
| 11 | D + CG + W2> | 0.6 | 0.0 | 2.2 | - | - | - | - |
| 12 | D + CG + <W2 | -2.1 | 0.0 | 2.1 | - | - | - | - |
| 13 | D + CU + W1> | 1.5 | 0.0 | -3.1 | - | - | - | - |
| 14 | D + CU + <W1 | -1.2 | 0.0 | -3.2 | - | - | - | - |
| 15 | D + CU + W2> | 0.6 | 0.0 | -0.4 | - | - | - | - |
| 16 | D + CU + <W2 | -2.1 | 0.0 | -0.5 | - | - | - | - |
| 17 | D + CG + L + W1> | 1.1 | 0.0 | 5.2 | - | - | - | - |
| 18 | D + CG + L + <W1 | -0.9 | 0.0 | 5.1 | - | - | - | - |
| 19 | D + CG + L + W2> | 0.4 | 0.0 | 7.3 | - | - | - | - |
| 20 | D + CG + L + <W2 | -1.6 | 0.0 | 7.2 | - | - | - | - |
| 21 | D + CG + S + W1> | 1.1 | 0.0 | 1.2 | - | - | - | - |
| 22 | D + CG + S + <W1 | -0.9 | 0.0 | 1.1 | - | - | - | - |
| 23 | D + CG + S + W2> | 0.4 | 0.0 | 3.3 | - | - | - | - |
| 24 | D + CG + S + <W2 | -1.6 | 0.0 | 3.2 | - | - | - | - |
| 25 | D + CG + E> + EG+ | 0.2 | 0.0 | 4.1 | - | - | - | - |
| 26 | D + CG + <E + EG+ | -0.2 | 0.0 | 4.2 | - | - | - | - |
| 27 | D + CU + E> + EG- | 0.2 | 0.0 | 1.4 | - | - | - | - |
| 28 | D + CU + <E + EG- | -0.2 | 0.0 | 1.5 | - | - | - | - |
| 29 | D + CG + E> + EG+ | 0.1 | 0.0 | 4.1 | - | - | - | - |
| 30 | D + CG + <E + EG+ | -0.1 | 0.0 | 4.2 | - | - | - | - |
| 31 | D + CG + WP + WB1> | 1.8 | 2.0 | 4.4 | - | - | - | - |
| 32 | D + CU + WP + WB1> | 1.8 | 2.0 | 1.9 | - | - | - | - |
| 33 | D + CG + L + WP + WB1> | 1.3 | 1.5 | 8.9 | - | - | - | - |
| 34 | D + CG + S + WP + WB1> | 1.3 | 1.5 | 4.9 | - | - | - | - |
| 35 | D + CG + WP + <WB1 | 2.0 | -2.1 | -6.9 | - | - | - | - |
| 36 | D + CU + WP + <WB1 | 2.0 | -2.1 | -9.5 | - | - | - | - |
| 37 | D + CG + L + WP + <WB1 | 1.5 | -1.5 | 0.4 | - | - | - | - |
| 38 | D + CG + S + WP + <WB1 | 1.5 | -1.5 | -3.6 | - | - | - | - |
| 39 | D + CG + WP + WB2> | 1.7 | 2.9 | 7.0 | - | - | - | - |
| 40 | D + CU + WP + WB2> | 1.7 | 2.9 | 4.5 | - | - | - | - |
| 41 | D + CG + L + WP + WB2> | 1.3 | 2.2 | 10.9 | - | - | - | - |
| 42 | D + CG + S + WP + WB2> | 1.3 | 2.2 | 6.9 | - | - | - | - |
| 43 | D + CG + WP + <WB2 | 1.9 | -1.2 | -4.3 | - | - | - | - |
| 44 | D + CU + WP + <WB2 | 1.9 | -1.2 | -6.9 | - | - | - | - |
| 45 | D + CG + L + WP + <WB2 | 1.5 | -0.9 | 2.4 | - | - | - | - |
| 46 | D + CG + S + WP + <WB2 | 1.5 | -0.9 | -1.6 | - | - | - | - |
| 47 | D + CG + EB> + EG+ | -0.0 | 0.6 | 5.6 | - | - | - | - |
| 48 | D + CU + EB> + EG- | -0.0 | 0.6 | 3.0 | - | - | - | - |
| 49 | D + CG + EB> + EG+ | -0.0 | 0.4 | 5.2 | - | - | - | - |
| 50 | D + CG + <EB + EG+ | 0.0 | -0.5 | 2.6 | - | - | - | - |
| 51 | D + CU + <EB + EG- | 0.0 | -0.5 | -0.0 | - | - | - | - |
| 52 | D + CG + <EB + EG+ | 0.0 | -0.4 | 3.0 | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

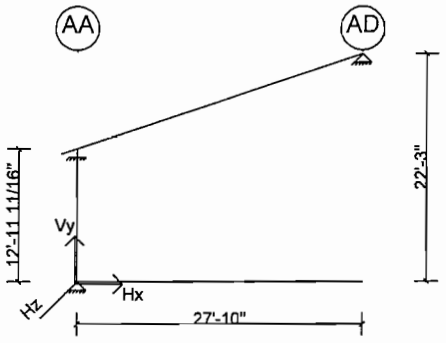
| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A3-AA | 2.1 | 12 | 2.0 | 36 | 2.1 | 36 | 2.9 | 39 | 9.5 | 36 | 10.9 | 41 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | AA-A3 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

**Wall: 2, Frame at: 38/0/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A2**

| Type | | Exterior Column | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | | |
| Grid1 - Grid2 | | A2-AA | | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | | |
| Column Base Elev. | | 100'-0" | | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | | | | |
| D | Frm | -0.0 | -0.0 | 2.5 | - | - | - | - |
| CG | Frm | - | - | 1.5 | - | - | - | - |
| L> | Frm | - | - | 6.1 | - | - | - | - |
| <L | Frm | - | - | 6.1 | - | - | - | - |
| S> | Frm | - | - | 0.8 | - | - | - | - |
| <S | Frm | - | - | 0.8 | - | - | - | - |
| S | Frm | - | - | 0.8 | - | - | - | - |
| SD | Frm | - | - | 0.6 | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| W1> | Frm | 1.5 | - | -4.6 | - | - | - | - |
| <W1 | Frm | -1.2 | - | -4.8 | - | - | - | - |
| W2> | Frm | 0.6 | - | -1.9 | - | - | - | - |
| <W2 | Frm | -2.1 | - | -2.0 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | - | - | 6.1 | - | - | - | - |
| E> | Frm | 0.2 | - | -0.1 | - | - | - | - |
| EG+ | Frm | - | - | 0.1 | - | - | - | - |
| <E | Frm | -0.2 | - | 0.1 | - | - | - | - |
| EG- | Frm | - | - | -0.1 | - | - | - | - |
| WP | Frm | 1.9 | - | -4.9 | - | - | - | - |
| WB1> | Brc | 0.1 | 1.8 | -5.3 | - | - | - | - |
| <WB1 | Brc | -0.1 | -2.2 | 6.0 | - | - | - | - |
| WB2> | Brc | 0.2 | 2.7 | -7.9 | - | - | - | - |
| <WB2 | Brc | -0.1 | -1.3 | 3.4 | - | - | - | - |
| EB> | Brc | 0.1 | 0.7 | -2.1 | - | - | - | - |
| <EB | Brc | -0.1 | -0.8 | 2.1 | - | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A2**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | | | | |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | A2-AA | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Hz | Vy | | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | | | | |
| 1 | D + CG + L> | -0.0 | -0.0 | 10.2 | - | - | - | - |
| 2 | D + CG + <L | -0.0 | -0.0 | 10.2 | - | - | - | - |
| 3 | D + CG + S> | -0.0 | -0.0 | 4.9 | - | - | - | - |
| 4 | D + CG + <S | -0.0 | -0.0 | 4.9 | - | - | - | - |
| 5 | D + CG + S + SD | -0.0 | -0.0 | 5.5 | - | - | - | - |
| 6 | D + CG + S + SS | -0.0 | -0.0 | 4.9 | - | - | - | - |
| 9 | D + CG + W1> | 1.5 | -0.0 | -0.5 | - | - | - | - |
| 10 | D + CG + <W1 | -1.2 | -0.0 | -0.7 | - | - | - | - |
| 11 | D + CG + W2> | 0.6 | -0.0 | 2.2 | - | - | - | - |
| 12 | D + CG + <W2 | -2.1 | -0.0 | 2.0 | - | - | - | - |
| 13 | D + CU + W1> | 1.5 | -0.0 | -3.1 | - | - | - | - |
| 14 | D + CU + <W1 | -1.2 | -0.0 | -3.2 | - | - | - | - |
| 15 | D + CU + W2> | 0.6 | -0.0 | -0.4 | - | - | - | - |
| 16 | D + CU + <W2 | -2.1 | -0.0 | -0.5 | - | - | - | - |
| 17 | D + CG + L + W1> | 1.1 | -0.0 | 5.2 | - | - | - | - |
| 18 | D + CG + L + <W1 | -0.9 | -0.0 | 5.1 | - | - | - | - |
| 19 | D + CG + L + W2> | 0.4 | -0.0 | 7.3 | - | - | - | - |
| 20 | D + CG + L + <W2 | -1.6 | -0.0 | 7.2 | - | - | - | - |
| 21 | D + CG + S + W1> | 1.1 | -0.0 | 1.2 | - | - | - | - |
| 22 | D + CG + S + <W1 | -0.9 | -0.0 | 1.1 | - | - | - | - |
| 23 | D + CG + S + W2> | 0.4 | -0.0 | 3.3 | - | - | - | - |
| 24 | D + CG + S + <W2 | -1.6 | -0.0 | 3.2 | - | - | - | - |
| 25 | D + CG + E> + EG+ | 0.2 | -0.0 | 4.1 | - | - | - | - |
| 26 | D + CG + <E + EG+ | -0.2 | -0.0 | 4.2 | - | - | - | - |
| 27 | D + CU + E> + EG- | 0.2 | -0.0 | 1.4 | - | - | - | - |
| 28 | D + CU + <E + EG- | -0.2 | -0.0 | 1.5 | - | - | - | - |
| 29 | D + CG + E> + EG+ | 0.1 | -0.0 | 4.1 | - | - | - | - |
| 30 | D + CG + <E + EG+ | -0.1 | -0.0 | 4.2 | - | - | - | - |
| 31 | D + CG + WP + WB1> | 2.0 | 1.8 | -6.1 | - | - | - | - |
| 32 | D + CU + WP + WB1> | 2.0 | 1.8 | -8.7 | - | - | - | - |
| 33 | D + CG + L + WP + WB1> | 1.5 | 1.3 | 1.0 | - | - | - | - |
| 34 | D + CG + S + WP + WB1> | 1.5 | 1.3 | -3.0 | - | - | - | - |
| 35 | D + CG + WP + <WB1 | 1.7 | -2.2 | 5.2 | - | - | - | - |
| 36 | D + CU + WP + <WB1 | 1.7 | -2.2 | 2.6 | - | - | - | - |
| 37 | D + CG + L + WP + <WB1 | 1.3 | -1.7 | 9.5 | - | - | - | - |
| 38 | D + CG + S + WP + <WB1 | 1.3 | -1.7 | 5.5 | - | - | - | - |
| 39 | D + CG + WP + WB2> | 2.1 | 2.7 | -8.7 | - | - | - | - |
| 40 | D + CU + WP + WB2> | 2.1 | 2.7 | -11.3 | - | - | - | - |
| 41 | D + CG + L + WP + WB2> | 1.5 | 2.0 | -0.9 | - | - | - | - |
| 42 | D + CG + S + WP + WB2> | 1.5 | 2.0 | -4.9 | - | - | - | - |
| 43 | D + CG + WP + <WB2 | 1.8 | -1.3 | 2.6 | - | - | - | - |
| 44 | D + CU + WP + <WB2 | 1.8 | -1.3 | 0.0 | - | - | - | - |
| 45 | D + CG + L + WP + <WB2 | 1.3 | -1.0 | 7.6 | - | - | - | - |
| 46 | D + CG + S + WP + <WB2 | 1.3 | -1.0 | 3.5 | - | - | - | - |
| 47 | D + CG + EB> + EG+ | 0.0 | 0.5 | 2.6 | - | - | - | - |
| 48 | D + CU + EB> + EG- | 0.0 | 0.5 | -0.0 | - | - | - | - |
| 49 | D + CG + EB> + EG+ | 0.0 | 0.4 | 3.0 | - | - | - | - |
| 50 | D + CG + <EB + EG+ | -0.0 | -0.6 | 5.6 | - | - | - | - |
| 51 | D + CU + <EB + EG- | -0.0 | -0.6 | 2.9 | - | - | - | - |
| 52 | D + CG + <EB + EG+ | -0.0 | -0.4 | 5.2 | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A2-AA | 2.1 | 12 | 2.1 | 40 | 2.2 | 35 | 2.7 | 40 | 11.3 | 40 | 10.2 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | AA-A2 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

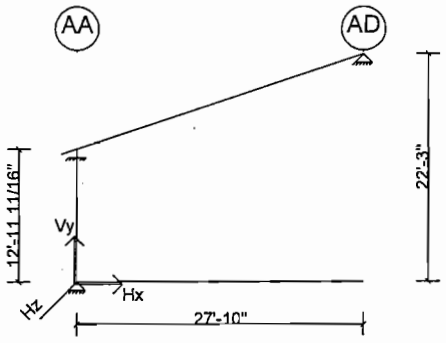
**Wall: 2, Frame at: 57/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SD | D + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S + 1.0 SS | D + CG + S + SS |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 31 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 32 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 33 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 34 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Wall: 2, Frame at: 57/0/0**
Frame ID:Leanto

Frame Type:Lean - To




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A1**

| Type | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | | | |
| Grid1 - Grid2 | | A1-AA | | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Vy | | | | |
| D | Frm | - | 1.3 | - | - | - | - |
| CG | Frm | - | 1.0 | - | - | - | - |
| L> | Frm | - | 3.9 | - | - | - | - |
| <L | Frm | - | 3.9 | - | - | - | - |
| S> | Frm | - | 0.5 | - | - | - | - |
| <S | Frm | - | 0.5 | - | - | - | - |
| S | Frm | - | 0.5 | - | - | - | - |
| SD | Frm | - | 0.3 | - | - | - | - |
| SS | Frm | - | - | - | - | - | - |
| W1> | Frm | 0.8 | -2.9 | - | - | - | - |
| <W1 | Frm | -0.7 | -3.8 | - | - | - | - |
| W2> | Frm | 0.3 | -1.4 | - | - | - | - |
| <W2 | Frm | -1.2 | -2.3 | - | - | - | - |
| WP | Frm | 1.1 | -4.1 | - | - | - | - |
| CU | Frm | - | - | - | - | - | - |
| L | Frm | - | 3.9 | - | - | - | - |
| E> | Frm | 0.1 | -0.1 | - | - | - | - |
| EG+ | Frm | - | 0.1 | - | - | - | - |
| <E | Frm | -0.1 | 0.1 | - | - | - | - |
| EG- | Frm | - | -0.1 | - | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A1**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | | | | |
|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | A1-AA | | | | | |
| Ld | Description | Hx | Vy | | | | |
| Cs | (application factor not shown) | (k) | (k) | | | | |
| 1 | D + CG + L> | - | 6.2 | - | - | - | - |
| 2 | D + CG + <L | - | 6.2 | - | - | - | - |
| 3 | D + CG + S> | - | 2.8 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | - | 2.8 | - | - | - | - |
| 5 | D + CG + S + SD | - | 3.1 | - | - | - | - |
| 6 | D + CG + S + SS | - | 2.8 | - | - | - | - |
| 9 | D + CG + W1> | 0.8 | -0.6 | - | - | - | - |
| 10 | D + CG + <W1 | -0.7 | -1.5 | - | - | - | - |
| 11 | D + CG + W2> | 0.3 | 0.9 | - | - | - | - |
| 12 | D + CG + <W2 | -1.2 | 0.0 | - | - | - | - |
| 13 | D + CG + WP | 1.1 | -1.7 | - | - | - | - |
| 14 | D + CU + W1> | 0.8 | -2.1 | - | - | - | - |
| 15 | D + CU + <W1 | -0.7 | -3.0 | - | - | - | - |
| 16 | D + CU + W2> | 0.3 | -0.6 | - | - | - | - |
| 17 | D + CU + <W2 | -1.2 | -1.5 | - | - | - | - |
| 18 | D + CU + WP | 1.1 | -3.3 | - | - | - | - |
| 19 | D + CG + L + W1> | 0.6 | 3.0 | - | - | - | - |
| 20 | D + CG + L + <W1 | -0.5 | 2.4 | - | - | - | - |
| 21 | D + CG + L + W2> | 0.3 | 4.2 | - | - | - | - |
| 22 | D + CG + L + <W2 | -0.9 | 3.5 | - | - | - | - |
| 23 | D + CG + L + WP | 0.8 | 2.2 | - | - | - | - |
| 24 | D + CG + S + W1> | 0.6 | 0.5 | - | - | - | - |
| 25 | D + CG + S + <W1 | -0.5 | -0.2 | - | - | - | - |
| 26 | D + CG + S + W2> | 0.3 | 1.6 | - | - | - | - |
| 27 | D + CG + S + <W2 | -0.9 | 1.0 | - | - | - | - |
| 28 | D + CG + S + WP | 0.8 | -0.4 | - | - | - | - |
| 29 | D + CG + E> + EG+ | 0.1 | 2.3 | - | - | - | - |
| 30 | D + CG + <E + EG+ | -0.1 | 2.4 | - | - | - | - |
| 31 | D + CU + E> + EG- | 0.1 | 0.7 | - | - | - | - |
| 32 | D + CU + <E + EG- | -0.1 | 0.8 | - | - | - | - |
| 33 | D + CG + E> + EG+ | 0.1 | 2.3 | - | - | - | - |
| 34 | D + CG + <E + EG+ | -0.1 | 2.4 | - | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A1-AA | 1.2 | 12 | 1.1 | 13 | - | - | - | - | 3.3 | 18 | 6.2 | 1 | - | - | - | - |

## Shape: Maintenance Area

**Loads and Codes - Shape: Maintenance Area**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.668)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 25/5/0
Parts / Portions Zone Strip Width: 10/2/0
Basic Wind Pressure: 24.57,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.50 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3055
Bracing Seismic Period: 0.1880
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

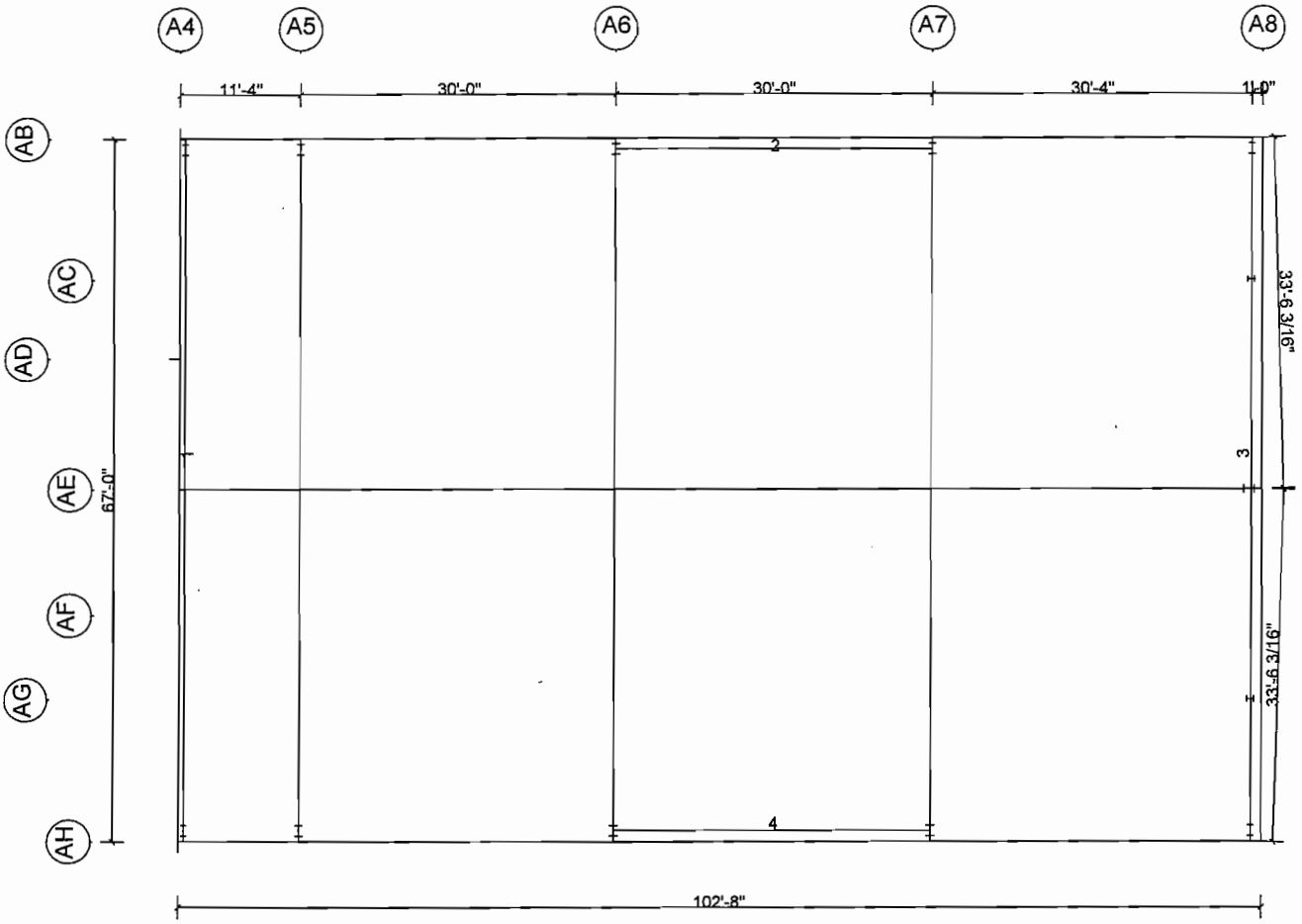
Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**User Applied Surface Loads (Local Coordinate System)**

| Side | Shape | Units | Type | Description | Mag | X-Loc | Y-Loc | Frm | Brc | Grt | Pur | Pnl | Supp. | Dir. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | LN | plf | CG | Clerestory | 35.00 | 0/2/0 | -0/2/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 102/8/0 | -0/2/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 0/0/0 | -6/0/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 102/8/0 | -6/0/0 | Y | N | N | N | N | N | IN | OF |

**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | A1- | A1-AM | 67/0/0 | 102/8/0 | 19/10/0 | 19/10/0 | 4.000:12 | 4.000:12 | 33/6/0 | 31/0/0 |


A4
A5
A6
A7
A8
11'-4"
30'-0"
30'-0"
30'-4"
1'-0"
AB
AC
AD
AE
AF
AG
AH
67'-0"
2
3
4
33'-6 3/16"
33'-6 3/16"
102'-8"

## Wall: 2

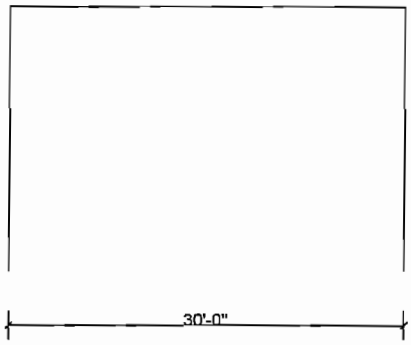
**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SD | D + AD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SS | D + AD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL> | D + AD + CG+*AL> |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL*> | D + AD + CG+AL*> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <*AL | D + AD + CG+<*AL |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <AL* | D + AD + CG+<AL* |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL> | D + AD + CG + S+*AL> |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL*> | D + AD + CG + S+AL*> |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <*AL | D + AD + CG + S+<*AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <AL* | D + AD + CG + S+<AL* |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 *AL> | D + AD + CG + W1>+*AL> |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL*> | D + AD + CG + W1>+AL*> |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <*AL | D + AD + CG + <W1+<*AL |
| 36 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <AL* | D + AD + CG + <W1+<AL* |
| 37 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 *AL> | D + AD + CG + W2>+*AL> |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL*> | D + AD + CG + W2>+AL*> |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <*AL | D + AD + CG + <W2+<*AL |
| 40 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <AL* | D + AD + CG + <W2+<AL* |
| 41 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 42 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 43 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 44 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 45 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 WB1> + 0.750 ALB> | D+AD+CG+WP+*AL+WB1>+ALB> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 WB1> + 0.750 ALB> | D+AD+CG+WP+AL*+WB1>+ALB> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 <WB1 + 0.750 <ALB | D+AD+CG+WP+*AL+<WB1+<ALB |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 <WB1 + 0.750 <ALB | D+AD+CG+WP+AL*+<WB1+<ALB |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 60 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 WB2> + 0.750 ALB> | D+AD+CG+WP+*AL+WB2>+ALB> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 WB2> + 0.750 ALB> | D+AD+CG+WP+AL*+WB2>+ALB> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 <WB2 + 0.750 <ALB | D+AD+CG+WP+*AL+<WB2+<ALB |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 <WB2 + 0.750 <ALB | D+AD+CG+WP+AL*+<WB2+<ALB |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 75 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 76 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL + 1.0 ALB> | D + AD + CG+*AL+ALB> |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL* + 1.0 ALB> | D + AD + CG+AL*+ALB> |
| 79 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL + 0.750 ALB> | D+AD+CG+S+*AL+ALB> |
| 80 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL* + 0.750 ALB> | D+AD+CG+S+AL*+ALB> |
| 81 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL + 1.0 <ALB | D + AD + CG+*AL+<ALB |
| 82 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL* + 1.0 <ALB | D + AD + CG+AL*+<ALB |
| 83 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL + 0.750 <ALB | D+AD+CG+S+*AL+<ALB |
| 84 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL* + 0.750 <ALB | D+AD+CG+S+AL*+<ALB |

**Wall: 2**
Frame ID:Portal Frame

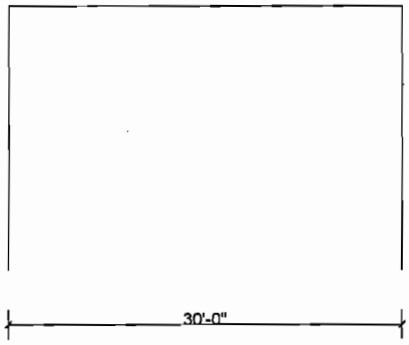
Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

**Wall: 4**
Frame ID:Portal Frame

Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

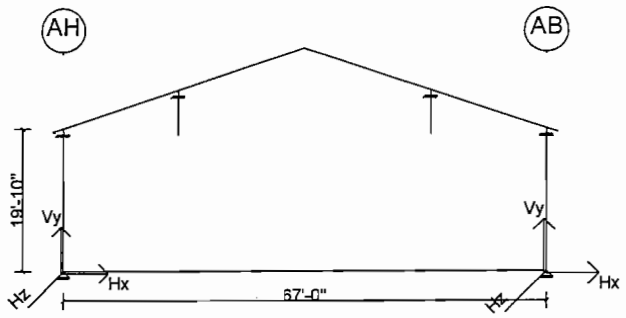
**Wall: 4, Frame at: 0/6/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SD | D + AD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SS | D + AD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL> | D + AD + CG+*AL> |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL*> | D + AD + CG+AL*> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <*AL | D + AD + CG+<*AL |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <AL* | D + AD + CG+<AL* |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL> | D + AD + CG + S+*AL> |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL*> | D + AD + CG + S+AL*> |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <*AL | D + AD + CG + S+<*AL |
| 36 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <AL* | D + AD + CG + S+<AL* |
| 37 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 *AL> | D + AD + CG + W1>+*AL> |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL*> | D + AD + CG + W1>+AL*> |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <*AL | D + AD + CG + <W1+<*AL |
| 40 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <AL* | D + AD + CG + <W1+<AL* |
| 41 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 *AL> | D + AD + CG + W2>+*AL> |
| 42 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL*> | D + AD + CG + W2>+AL*> |
| 43 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <*AL | D + AD + CG + <W2+<*AL |
| 44 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <AL* | D + AD + CG + <W2+<AL* |
| 45 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL> | D + AD + CG + WP+*AL> |
| 46 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL*> | D + AD + CG + WP+AL*> |
| 47 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 <*AL | D + AD + CG + WP+<*AL |
| 48 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 <AL* | D + AD + CG + WP+<AL* |
| 49 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 51 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 52 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 53 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 54 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Wall: 4, Frame at: 0/6/0**
Frame ID:Rigid Frame - RHC

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A4**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | A4-AH | | A4-AB | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | 8 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.6 | 1.6 | -0.6 | 1.6 | - | - | - |
| AD | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| CG | Frm | 0.7 | 1.3 | -0.7 | 1.2 | - | - | - |
| L> | Frm | 1.7 | 3.8 | -1.7 | 3.8 | - | - | - |
| <L | Frm | 1.7 | 3.8 | -1.7 | 3.8 | - | - | - |
| S> | Frm | 0.2 | 0.5 | -0.2 | 0.5 | - | - | - |
| <S | Frm | 0.2 | 0.5 | -0.2 | 0.5 | - | - | - |
| S | Frm | 0.2 | 0.5 | -0.2 | 0.5 | - | - | - |
| SD | Frm | - | 0.1 | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | 0.3 | 0.4 | -0.3 | 0.6 | - | - | - |
| *US1 | Frm | 0.1 | 0.4 | -0.1 | 0.2 | - | - | - |
| W1> | Frm | -2.6 | -4.0 | -0.3 | -2.5 | - | - | - |
| <W1 | Frm | 0.0 | -2.7 | 2.5 | -3.9 | - | - | - |
| W2> | Frm | -2.5 | -2.3 | -0.3 | -0.9 | - | - | - |
| <W2 | Frm | 0.2 | -1.0 | 2.5 | -2.3 | - | - | - |
| WP | Frm | -0.7 | -4.4 | 0.3 | -4.2 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| *AL> | Frm | 1.0 | 3.1 | -1.7 | 2.0 | - | - | - |
| AL*> | Frm | 1.0 | 1.5 | -1.7 | 3.6 | - | - | - |
| <*AL | Frm | 1.7 | 3.6 | -1.0 | 1.5 | - | - | - |
| <AL* | Frm | 1.7 | 2.0 | -1.0 | 3.1 | - | - | - |
| L | Frm | 1.7 | 3.8 | -1.7 | 3.8 | - | - | - |
| E> | Frm | -0.4 | -0.2 | -0.4 | 0.2 | - | - | - |
| EG+ | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| <E | Frm | 0.4 | 0.2 | 0.4 | -0.2 | - | - | - |
| EG- | Frm | -0.0 | -0.1 | 0.0 | -0.1 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A4**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | 67/0/0 | | | |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | A4-AH | | A4-AB | | | | |
|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + AD + CG + L> | 3.0 | 6.9 | -3.0 | 6.9 | - | - | - |
| 2 | D + AD + CG + <L | 3.0 | 6.9 | -3.0 | 6.9 | - | - | - |
| 3 | D + AD + CG + S> | 1.5 | 3.6 | -1.5 | 3.5 | - | - | - |
| 4 | D + AD + CG + <S | 1.5 | 3.6 | -1.5 | 3.5 | - | - | - |
| 5 | D + AD + CG + S + SD | 1.5 | 3.7 | -1.5 | 3.5 | - | - | - |
| 6 | D + AD + CG + S + SS | 1.5 | 3.6 | -1.5 | 3.5 | - | - | - |
| 7 | D + AD + CG + US1* | 1.6 | 3.5 | -1.6 | 3.7 | - | - | - |
| 8 | D + AD + CG + *US1 | 1.4 | 3.5 | -1.4 | 3.3 | - | - | - |
| 9 | D + AD + CG + W1> | -1.3 | -0.8 | -1.6 | 0.6 | - | - | - |
| 10 | D + AD + CG + <W1 | 1.3 | 0.4 | 1.2 | -0.8 | - | - | - |
| 11 | D + AD + CG + W2> | -1.2 | 0.8 | -1.6 | 2.1 | - | - | - |
| 12 | D + AD + CG + <W2 | 1.5 | 2.1 | 1.2 | 0.7 | - | - | - |
| 13 | D + AD + CG + WP | 0.7 | -1.3 | -1.0 | -1.2 | - | - | - |
| 14 | D + AD + CU + W1> | -2.2 | -2.8 | -0.7 | -1.4 | - | - | - |
| 15 | D + AD + CU + <W1 | 0.4 | -1.6 | 2.1 | -2.8 | - | - | - |
| 16 | D + AD + CU + W2> | -2.1 | -1.2 | -0.7 | 0.2 | - | - | - |
| 17 | D + AD + CU + <W2 | 0.6 | 0.1 | 2.1 | -1.2 | - | - | - |
| 18 | D + AD + CU + WP | -0.3 | -3.3 | -0.1 | -3.1 | - | - | - |
| 19 | D + AD + CG+*AL> | 2.3 | 6.3 | -3.0 | 5.0 | - | - | - |
| 20 | D + AD + CG+AL*> | 2.3 | 4.6 | -3.0 | 6.7 | - | - | - |
| 21 | D + AD + CG+<*AL | 3.0 | 6.7 | -2.3 | 4.5 | - | - | - |
| 22 | D + AD + CG+<AL* | 3.0 | 5.1 | -2.3 | 6.2 | - | - | - |
| 23 | D + AD + CG + L + W1> | 0.6 | 3.0 | -2.8 | 4.1 | - | - | - |
| 24 | D + AD + CG + L + <W1 | 2.6 | 4.0 | -0.7 | 3.0 | - | - | - |
| 25 | D + AD + CG + L + W2> | 0.7 | 4.2 | -2.8 | 5.3 | - | - | - |
| 26 | D + AD + CG + L + <W2 | 2.7 | 5.2 | -0.7 | 4.2 | - | - | - |
| 27 | D + AD + CG + L + WP | 2.1 | 2.6 | -2.4 | 2.8 | - | - | - |
| 28 | D + AD + CG + S + W1> | -0.5 | 0.5 | -1.7 | 1.6 | - | - | - |
| 29 | D + AD + CG + S + <W1 | 1.5 | 1.5 | 0.4 | 0.5 | - | - | - |
| 30 | D + AD + CG + S + W2> | -0.4 | 1.8 | -1.7 | 2.7 | - | - | - |
| 31 | D + AD + CG + S + <W2 | 1.6 | 2.7 | 0.4 | 1.7 | - | - | - |
| 32 | D + AD + CG + S + WP | 1.0 | 0.1 | -1.3 | 0.2 | - | - | - |
| 33 | D + AD + CG + S+*AL> | 2.2 | 5.7 | -2.7 | 4.8 | - | - | - |
| 34 | D + AD + CG + S+AL*> | 2.2 | 4.5 | -2.7 | 6.0 | - | - | - |
| 35 | D + AD + CG + S+<*AL | 2.7 | 6.1 | -2.2 | 4.4 | - | - | - |
| 36 | D + AD + CG + S+<AL* | 2.7 | 4.9 | -2.2 | 5.7 | - | - | - |
| 37 | D + AD + CG + W1>+*AL> | 1.1 | 4.0 | -2.7 | 3.6 | - | - | - |
| 38 | D + AD + CG + W1>+AL*> | 1.1 | 2.7 | -2.7 | 4.8 | - | - | - |
| 39 | D + AD + CG + <W1+<*AL | 2.6 | 4.8 | -1.1 | 2.7 | - | - | - |
| 40 | D + AD + CG + <W1+<AL* | 2.6 | 3.6 | -1.1 | 3.9 | - | - | - |
| 41 | D + AD + CG + W2>+*AL> | 1.1 | 4.6 | -2.7 | 4.2 | - | - | - |
| 42 | D + AD + CG + W2>+AL*> | 1.1 | 3.4 | -2.7 | 5.4 | - | - | - |
| 43 | D + AD + CG + <W2+<*AL | 2.6 | 5.5 | -1.1 | 3.3 | - | - | - |
| 44 | D + AD + CG + <W2+<AL* | 2.6 | 4.2 | -1.1 | 4.5 | - | - | - |
| 45 | D + AD + CG + WP+*AL> | 1.8 | 3.8 | -2.5 | 2.9 | - | - | - |
| 46 | D + AD + CG + WP+AL*> | 1.8 | 2.6 | -2.5 | 4.2 | - | - | - |
| 47 | D + AD + CG + WP+<*AL | 2.3 | 4.2 | -2.0 | 2.6 | - | - | - |
| 48 | D + AD + CG + WP+<AL* | 2.3 | 2.9 | -2.0 | 3.8 | - | - | - |
| 49 | D + AD + CG + E> + EG+ | 1.1 | 3.0 | -1.6 | 3.2 | - | - | - |
| 50 | D + AD + CG + <E + EG+ | 1.6 | 3.3 | -1.1 | 3.0 | - | - | - |
| 51 | D + AD + CU + E> + EG- | 0.1 | 0.9 | -0.7 | 1.2 | - | - | - |
| 52 | D + AD + CU + <E + EG- | 0.7 | 1.2 | -0.1 | 0.9 | - | - | - |
| 53 | D + AD + CG + E> + EG+ | 1.1 | 3.1 | -1.5 | 3.2 | - | - | - |
| 54 | D + AD + CG + <E + EG+ | 1.5 | 3.3 | -1.1 | 3.0 | - | - | - |

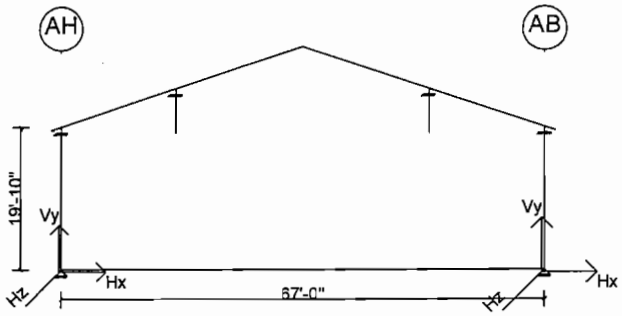
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A4-AH | 2.2 | 14 | 3.0 | 1 | - | - | - | - | 3.3 | 18 | 6.9 | 1 | - | - | - | - |
| 67/0/0 | A4-AB | 3.0 | 1 | 2.1 | 15 | - | - | - | - | 3.1 | 18 | 6.9 | 1 | - | - | - | - |

**Wall: 4, Frame at: 11/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A5**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 67/0/0 | | | | |
| Grid1 - Grid2 | | A5-AH | | A5-AB | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.5 | 4.0 | -1.5 | 4.0 | - | - | - |
| AD | Frm | 0.4 | 0.8 | -0.4 | 0.8 | - | - | - |
| CG | Frm | 2.4 | 4.4 | -2.4 | 4.2 | - | - | - |
| L> | Frm | 6.0 | 13.0 | -6.0 | 13.2 | - | - | - |
| <L | Frm | 6.0 | 13.0 | -6.0 | 13.2 | - | - | - |
| S> | Frm | 0.7 | 1.7 | -0.7 | 1.7 | - | - | - |
| <S | Frm | 0.7 | 1.7 | -0.7 | 1.7 | - | - | - |
| S | Frm | 0.7 | 1.7 | -0.7 | 1.7 | - | - | - |
| SD | Frm | - | 0.0 | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - |
| US1* | Frm | 1.1 | 1.3 | -1.1 | 2.2 | - | - | - |
| *US1 | Frm | 0.4 | 1.4 | -0.4 | 0.7 | - | - | - |
| W1> | Frm | -9.4 | -13.7 | -1.0 | -8.5 | - | - | - |
| <W1 | Frm | 0.1 | -9.2 | 9.0 | -13.5 | - | - | - |
| W2> | Frm | -9.0 | -8.0 | -1.1 | -3.1 | - | - | - |
| <W2 | Frm | 0.6 | -3.5 | 8.9 | -8.1 | - | - | - |
| WP | Frm | -1.6 | -14.1 | 0.8 | -13.6 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| *AL> | Frm | 1.3 | 3.9 | -2.1 | 2.4 | - | - | - |
| AL*> | Frm | 1.3 | 1.8 | -2.1 | 4.5 | - | - | - |
| <*AL | Frm | 2.1 | 4.5 | -1.3 | 1.8 | - | - | - |
| <AL* | Frm | 2.1 | 2.4 | -1.3 | 3.9 | - | - | - |
| L | Frm | 6.0 | 13.0 | -6.0 | 13.2 | - | - | - |
| E> | Frm | -1.3 | -0.7 | -1.3 | 0.7 | - | - | - |
| EG+ | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| <E | Frm | 1.3 | 0.7 | 1.3 | -0.7 | - | - | - |
| EG- | Frm | -0.1 | -0.2 | 0.1 | -0.2 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A5**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | 67/0/0 | | | |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | A5-AH | | A5-AB | | | | |
|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + AD + CG + L> | 10.3 | 22.2 | -10.3 | 22.3 | - | - | - |
| 2 | D + AD + CG + <L | 10.3 | 22.2 | -10.3 | 22.3 | - | - | - |
| 3 | D + AD + CG + S> | 5.1 | 10.9 | -5.1 | 10.8 | - | - | - |
| 4 | D + AD + CG + <S | 5.1 | 10.9 | -5.1 | 10.8 | - | - | - |
| 5 | D + AD + CG + S + SD | 5.1 | 10.9 | -5.1 | 10.8 | - | - | - |
| 6 | D + AD + CG + S + SS | 5.1 | 10.9 | -5.1 | 10.8 | - | - | - |
| 7 | D + AD + CG + US1* | 5.4 | 10.5 | -5.4 | 11.3 | - | - | - |
| 8 | D + AD + CG + *US1 | 4.8 | 10.6 | -4.8 | 9.8 | - | - | - |
| 9 | D + AD + CG + W1> | -5.1 | -4.5 | -5.3 | 0.6 | - | - | - |
| 10 | D + AD + CG + <W1 | 4.5 | 0.0 | 4.7 | -4.4 | - | - | - |
| 11 | D + AD + CG + W2> | -4.6 | 1.2 | -5.4 | 6.0 | - | - | - |
| 12 | D + AD + CG + <W2 | 4.9 | 5.7 | 4.6 | 1.0 | - | - | - |
| 13 | D + AD + CG + WP | 2.7 | -4.9 | -3.5 | -4.5 | - | - | - |
| 14 | D + AD + CU + W1> | -8.2 | -10.8 | -2.2 | -5.6 | - | - | - |
| 15 | D + AD + CU + <W1 | 1.3 | -6.3 | 7.8 | -10.6 | - | - | - |
| 16 | D + AD + CU + W2> | -7.8 | -5.1 | -2.3 | -0.2 | - | - | - |
| 17 | D + AD + CU + <W2 | 1.7 | -0.6 | 7.7 | -5.1 | - | - | - |
| 18 | D + AD + CU + WP | -0.4 | -11.2 | -0.4 | -10.7 | - | - | - |
| 19 | D + AD + CG+*AL> | 5.6 | 13.1 | -6.4 | 11.5 | - | - | - |
| 20 | D + AD + CG+AL*> | 5.6 | 11.0 | -6.4 | 13.6 | - | - | - |
| 21 | D + AD + CG+<*AL | 6.4 | 13.7 | -5.6 | 10.9 | - | - | - |
| 22 | D + AD + CG+<AL* | 6.4 | 11.6 | -5.6 | 13.0 | - | - | - |
| 23 | D + AD + CG + L + W1> | 1.8 | 8.7 | -9.6 | 12.6 | - | - | - |
| 24 | D + AD + CG + L + <W1 | 8.9 | 12.1 | -2.1 | 8.9 | - | - | - |
| 25 | D + AD + CG + L + W2> | 2.1 | 13.0 | -9.7 | 16.7 | - | - | - |
| 26 | D + AD + CG + L + <W2 | 9.3 | 16.3 | -2.2 | 13.0 | - | - | - |
| 27 | D + AD + CG + L + WP | 7.6 | 8.4 | -8.2 | 8.8 | - | - | - |
| 28 | D + AD + CG + S + W1> | -2.2 | 0.2 | -5.6 | 4.0 | - | - | - |
| 29 | D + AD + CG + S + <W1 | 5.0 | 3.6 | 1.9 | 0.3 | - | - | - |
| 30 | D + AD + CG + S + W2> | -1.8 | 4.4 | -5.7 | 8.1 | - | - | - |
| 31 | D + AD + CG + S + <W2 | 5.3 | 7.8 | 1.8 | 4.3 | - | - | - |
| 32 | D + AD + CG + S + WP | 3.7 | -0.2 | -4.3 | 0.2 | - | - | - |
| 33 | D + AD + CG + S+*AL> | 5.7 | 13.1 | -6.3 | 11.9 | - | - | - |
| 34 | D + AD + CG + S+AL*> | 5.7 | 11.5 | -6.3 | 13.4 | - | - | - |
| 35 | D + AD + CG + S+<*AL | 6.3 | 13.5 | -5.7 | 11.4 | - | - | - |
| 36 | D + AD + CG + S+<AL* | 6.3 | 12.0 | -5.7 | 13.0 | - | - | - |
| 37 | D + AD + CG + W1>+*AL> | 1.8 | 7.0 | -6.3 | 7.7 | - | - | - |
| 38 | D + AD + CG + W1>+AL*> | 1.8 | 5.4 | -6.3 | 9.3 | - | - | - |
| 39 | D + AD + CG + <W1+<*AL | 5.9 | 9.1 | -1.9 | 5.4 | - | - | - |
| 40 | D + AD + CG + <W1+<AL* | 5.9 | 7.6 | -1.9 | 7.0 | - | - | - |
| 41 | D + AD + CG + W2>+*AL> | 1.9 | 9.1 | -6.3 | 9.8 | - | - | - |
| 42 | D + AD + CG + W2>+AL*> | 1.9 | 7.6 | -6.3 | 11.3 | - | - | - |
| 43 | D + AD + CG + <W2+<*AL | 6.1 | 11.3 | -2.0 | 7.5 | - | - | - |
| 44 | D + AD + CG + <W2+<AL* | 6.1 | 9.7 | -1.9 | 9.0 | - | - | - |
| 45 | D + AD + CG + WP+*AL> | 4.7 | 6.8 | -5.6 | 5.8 | - | - | - |
| 46 | D + AD + CG + WP+AL*> | 4.7 | 5.3 | -5.6 | 7.4 | - | - | - |
| 47 | D + AD + CG + WP+<*AL | 5.3 | 7.3 | -5.0 | 5.4 | - | - | - |
| 48 | D + AD + CG + WP+<AL* | 5.3 | 5.7 | -5.0 | 6.9 | - | - | - |
| 49 | D + AD + CG + E> + EG+ | 3.5 | 8.9 | -5.3 | 9.7 | - | - | - |
| 50 | D + AD + CG + <E + EG+ | 5.3 | 9.8 | -3.5 | 8.8 | - | - | - |
| 51 | D + AD + CU + E> + EG- | 0.2 | 2.3 | -2.0 | 3.2 | - | - | - |
| 52 | D + AD + CU + <E + EG- | 2.0 | 3.2 | -0.2 | 2.3 | - | - | - |
| 53 | D + AD + CG + E> + EG+ | 3.7 | 9.0 | -5.1 | 9.6 | - | - | - |
| 54 | D + AD + CG + <E + EG+ | 5.1 | 9.7 | -3.7 | 8.9 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A5-AH | 8.2 | 14 | 10.3 | 1 | - | - | - | - | 11.2 | 18 | 22.2 | 1 | - | - | - | - |
| 67/0/0 | A5-AB | 10.3 | 1 | 7.8 | 15 | - | - | - | - | 10.7 | 18 | 22.3 | 1 | - | - | - | - |

**Wall: 4, Frame at: 41/4/0**

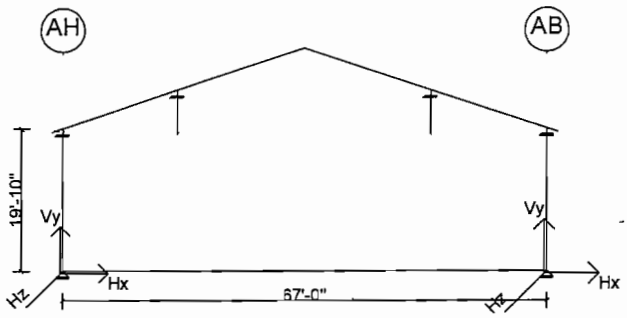
**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SD | D + AD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SS | D + AD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 13 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL> | D + AD + CG+*AL> |
| 18 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL*> | D + AD + CG+AL*> |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <*AL | D + AD + CG+<*AL |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <AL* | D + AD + CG+<AL* |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL> | D + AD + CG + S+*AL> |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL*> | D + AD + CG + S+AL*> |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <*AL | D + AD + CG + S+<*AL |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <AL* | D + AD + CG + S+<AL* |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 *AL> | D + AD + CG + W1>+*AL> |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL*> | D + AD + CG + W1>+AL*> |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <*AL | D + AD + CG + <W1+<*AL |
| 36 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <AL* | D + AD + CG + <W1+<AL* |
| 37 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 *AL> | D + AD + CG + W2>+*AL> |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL*> | D + AD + CG + W2>+AL*> |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <*AL | D + AD + CG + <W2+<*AL |
| 40 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <AL* | D + AD + CG + <W2+<AL* |
| 41 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 42 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 43 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 44 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 45 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 46 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB1> | D + AD + CG + WP + WB1> |
| 48 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB1> | D + AD + CU + WP + WB1> |
| 49 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D+AD+CG+L+WP+WB1> |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D+AD+CG+S+WP+WB1> |
| 51 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 WB1> + 0.750 ALB> | D+AD+CG+WP+*AL+WB1>+ALB> |
| 52 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 WB1> + 0.750 ALB> | D+AD+CG+WP+AL*+WB1>+ALB> |
| 53 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + AD + CG + WP + <WB1 |
| 54 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + AD + CU + WP + <WB1 |
| 55 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D+AD+CG+L+WP+<WB1 |
| 56 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D+AD+CG+S+WP+<WB1 |
| 57 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 <WB1 + 0.750 <ALB | D+AD+CG+WP+*AL+<WB1+<ALB |
| 58 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 <WB1 + 0.750 <ALB | D+AD+CG+WP+AL*+<WB1+<ALB |
| 59 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 WB2> | D + AD + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 60 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 WB2> | D + AD + CU + WP + WB2> |
| 61 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D+AD+CG+L+WP+WB2> |
| 62 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D+AD+CG+S+WP+WB2> |
| 63 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 WB2> + 0.750 ALB> | D+AD+CG+WP+*AL+WB2>+ALB> |
| 64 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 WB2> + 0.750 ALB> | D+AD+CG+WP+AL*+WB2>+ALB> |
| 65 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + AD + CG + WP + <WB2 |
| 66 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + AD + CU + WP + <WB2 |
| 67 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D+AD+CG+L+WP+<WB2 |
| 68 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D+AD+CG+S+WP+<WB2 |
| 69 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL + 0.375 <WB2 + 0.750 <ALB | D+AD+CG+WP+*AL+<WB2+<ALB |
| 70 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL* + 0.375 <WB2 + 0.750 <ALB | D+AD+CG+WP+AL*+<WB2+<ALB |
| 71 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + AD + CG + EB> + EG+ |
| 72 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 EB> + 0.700 EG- | D + AD + CU + EB> + EG- |
| 73 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + AD + CG + EB> + EG+ |
| 74 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + AD + CG + <EB + EG+ |
| 75 | System Derived | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <EB + 0.700 EG- | D + AD + CU + <EB + EG- |
| 76 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + AD + CG + <EB + EG+ |
| 77 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL + 1.0 ALB> | D + AD + CG+*AL+ALB> |
| 78 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL* + 1.0 ALB> | D + AD + CG+AL*+ALB> |
| 79 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL + 0.750 ALB> | D+AD+CG+S+*AL+ALB> |
| 80 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL* + 0.750 ALB> | D+AD+CG+S+AL*+ALB> |
| 81 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL + 1.0 <ALB | D + AD + CG+*AL+<ALB |
| 82 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL* + 1.0 <ALB | D + AD + CG+AL*+<ALB |
| 83 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL + 0.750 <ALB | D+AD+CG+S+*AL+<ALB |
| 84 | System Derived | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL* + 0.750 <ALB | D+AD+CG+S+AL*+<ALB |

**Wall: 4, Frame at: 41/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A6**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 67/0/0 | | | | | |
| Grid1 - Grid2 | | A6-AH | | | A6-AB | | | | | |
| Base Plate W x L (in.) | | 10 x 13 | | | 10 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | | 4 - 1.000 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 2.1 | 0.1 | 7.4 | -2.1 | -0.1 | 7.5 | - | - | - |
| AD | Frm | 0.6 | - | 1.2 | -0.6 | - | 1.2 | - | - | - |
| CG | Frm | 3.5 | - | 6.4 | -3.5 | - | 6.2 | - | - | - |
| L> | Frm | 8.9 | - | 19.1 | -8.9 | - | 19.4 | - | - | - |
| <L | Frm | 8.9 | - | 19.1 | -8.9 | - | 19.4 | - | - | - |
| S> | Frm | 1.1 | - | 2.4 | -1.1 | - | 2.5 | - | - | - |
| <S | Frm | 1.1 | - | 2.4 | -1.1 | - | 2.5 | - | - | - |
| S | Frm | 1.1 | - | 2.4 | -1.1 | - | 2.5 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - |
| US1* | Frm | 1.6 | - | 2.0 | -1.6 | - | 3.2 | - | - | - |
| *US1 | Frm | 0.7 | - | 2.0 | -0.7 | - | 1.0 | - | - | - |
| W1> | Frm | -13.8 | - | -20.1 | -1.5 | - | -12.5 | - | - | - |
| <W1 | Frm | 0.2 | - | -13.5 | 13.2 | - | -19.8 | - | - | - |
| W2> | Frm | -13.2 | - | -11.8 | -1.6 | - | -4.5 | - | - | - |
| <W2 | Frm | 0.8 | - | -5.2 | 13.1 | - | -11.8 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| *AL> | Frm | 1.3 | - | 3.9 | -2.1 | - | 2.4 | - | - | - |
| AL*> | Frm | 1.3 | - | 1.8 | -2.1 | - | 4.5 | - | - | - |
| <*AL | Frm | 2.1 | - | 4.5 | -1.3 | - | 1.8 | - | - | - |
| <AL* | Frm | 2.1 | - | 2.4 | -1.3 | - | 3.9 | - | - | - |
| L | Frm | 8.9 | - | 19.1 | -8.9 | - | 19.4 | - | - | - |
| E> | Frm | -1.9 | - | -0.9 | -1.9 | - | 1.0 | - | - | - |
| EG+ | Frm | 0.2 | - | 0.3 | -0.2 | - | 0.3 | - | - | - |
| <E | Frm | 1.9 | - | 0.9 | 1.9 | - | -1.0 | - | - | - |
| EG- | Frm | -0.2 | - | -0.3 | 0.2 | - | -0.3 | - | - | - |
| WP | Frm | 0.2 | - | -15.2 | -1.0 | - | -14.6 | - | - | - |
| WB1> | Brc | 0.1 | -3.5 | -9.9 | -0.1 | 3.2 | -8.6 | - | - | - |
| *AL | Frm | 1.7 | - | 4.2 | -1.7 | - | 2.1 | - | - | - |
| ALB> | Brc | - | -0.1 | -0.3 | - | -0.1 | 0.3 | - | - | - |
| AL* | Frm | 1.7 | - | 2.1 | -1.7 | - | 4.2 | - | - | - |
| <WB1 | Brc | -0.1 | 3.2 | 8.4 | 0.1 | -2.9 | 7.4 | - | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| <ALB | Brc | - | 0.1 | 0.3 | - | 0.1 | -0.3 | - | - | - |
| WB2> | Brc | 0.0 | -1.7 | -4.9 | -0.0 | 1.7 | -4.6 | - | - | - |
| <WB2 | Brc | -0.1 | 5.1 | 13.4 | 0.1 | -4.5 | 11.4 | - | - | - |
| EB> | Brc | 0.0 | -1.6 | -4.4 | -0.0 | 1.4 | -3.7 | - | - | - |
| <EB | Brc | -0.0 | 1.7 | 4.4 | 0.0 | -1.5 | 3.7 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A6**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | | 67/0/0 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | A6-AH | | | A6-AB | | | | | |
| Ld | Description | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | | | |
| 1 | D + AD + CG + L> | 15.2 | 0.1 | 34.2 | -15.2 | -0.1 | 34.4 | - | - | - |
| 2 | D + AD + CG + <L | 15.2 | 0.1 | 34.2 | -15.2 | -0.1 | 34.4 | - | - | - |
| 3 | D + AD + CG + S> | 7.4 | 0.1 | 17.5 | -7.4 | -0.1 | 17.4 | - | - | - |
| 4 | D + AD + CG + <S | 7.4 | 0.1 | 17.5 | -7.4 | -0.1 | 17.4 | - | - | - |
| 5 | D + AD + CG + S + SD | 7.4 | 0.1 | 17.5 | -7.4 | -0.1 | 17.4 | - | - | - |
| 6 | D + AD + CG + S + SS | 7.4 | 0.1 | 17.5 | -7.4 | -0.1 | 17.4 | - | - | - |
| 7 | D + AD + CG + US1* | 7.9 | 0.1 | 17.0 | -7.9 | -0.1 | 18.1 | - | - | - |
| 8 | D + AD + CG + *US1 | 7.0 | 0.1 | 17.1 | -7.0 | -0.1 | 16.0 | - | - | - |
| 9 | D + AD + CG + W1> | -7.5 | 0.1 | -5.0 | -7.8 | -0.1 | 2.4 | - | - | - |
| 10 | D + AD + CG + <W1 | 6.5 | 0.1 | 1.6 | 6.9 | -0.1 | -4.9 | - | - | - |
| 11 | D + AD + CG + W2> | -6.9 | 0.1 | 3.3 | -7.9 | -0.1 | 10.4 | - | - | - |
| 12 | D + AD + CG + <W2 | 7.1 | 0.1 | 9.9 | 6.8 | -0.1 | 3.1 | - | - | - |
| 13 | D + AD + CU + W1> | -12.2 | 0.0 | -14.9 | -3.1 | -0.0 | -7.3 | - | - | - |
| 14 | D + AD + CU + <W1 | 1.8 | 0.0 | -8.3 | 11.5 | -0.0 | -14.6 | - | - | - |
| 15 | D + AD + CU + W2> | -11.5 | 0.0 | -6.6 | -3.3 | -0.0 | 0.7 | - | - | - |
| 16 | D + AD + CU + <W2 | 2.5 | 0.0 | 0.0 | 11.4 | -0.0 | -6.6 | - | - | - |
| 17 | D + AD + CG+*AL> | 7.6 | 0.1 | 19.0 | -8.4 | -0.1 | 17.4 | - | - | - |
| 18 | D + AD + CG+AL*> | 7.6 | 0.1 | 16.9 | -8.4 | -0.1 | 19.4 | - | - | - |
| 19 | D + AD + CG+<*AL | 8.4 | 0.1 | 19.6 | -7.6 | -0.1 | 16.8 | - | - | - |
| 20 | D + AD + CG+<AL* | 8.4 | 0.1 | 17.5 | -7.6 | -0.1 | 18.8 | - | - | - |
| 21 | D + AD + CG + L + W1> | 2.6 | 0.1 | 14.3 | -14.1 | -0.1 | 20.1 | - | - | - |
| 22 | D + AD + CG + L + <W1 | 13.1 | 0.1 | 19.3 | -3.1 | -0.1 | 14.7 | - | - | - |
| 23 | D + AD + CG + L + W2> | 3.1 | 0.1 | 20.6 | -14.2 | -0.1 | 26.1 | - | - | - |
| 24 | D + AD + CG + L + <W2 | 13.6 | 0.1 | 25.5 | -3.2 | -0.1 | 20.6 | - | - | - |
| 25 | D + AD + CG + S + W1> | -3.2 | 0.1 | 1.8 | -8.2 | -0.1 | 7.4 | - | - | - |
| 26 | D + AD + CG + S + <W1 | 7.3 | 0.1 | 6.8 | 2.8 | -0.1 | 1.9 | - | - | - |
| 27 | D + AD + CG + S + W2> | -2.8 | 0.1 | 8.0 | -8.4 | -0.1 | 13.4 | - | - | - |
| 28 | D + AD + CG + S + <W2 | 7.8 | 0.1 | 13.0 | 2.7 | -0.1 | 7.9 | - | - | - |
| 29 | D + AD + CG + S+*AL> | 7.9 | 0.1 | 19.4 | -8.5 | -0.1 | 18.2 | - | - | - |
| 30 | D + AD + CG + S+AL*> | 7.9 | 0.1 | 17.8 | -8.5 | -0.1 | 19.7 | - | - | - |
| 31 | D + AD + CG + S+<*AL | 8.5 | 0.1 | 19.8 | -7.9 | -0.1 | 17.7 | - | - | - |
| 32 | D + AD + CG + S+<AL* | 8.5 | 0.1 | 18.3 | -7.9 | -0.1 | 19.3 | - | - | - |
| 33 | D + AD + CG + W1>+*AL> | 2.1 | 0.1 | 10.4 | -8.4 | -0.1 | 12.1 | - | - | - |
| 34 | D + AD + CG + W1>+AL*> | 2.1 | 0.1 | 8.9 | -8.4 | -0.1 | 13.6 | - | - | - |
| 35 | D + AD + CG + <W1+<*AL | 8.0 | 0.1 | 13.4 | -2.3 | -0.1 | 8.9 | - | - | - |
| 36 | D + AD + CG + <W1+<AL* | 8.0 | 0.1 | 11.8 | -2.3 | -0.1 | 10.4 | - | - | - |
| 37 | D + AD + CG + W2>+*AL> | 2.3 | 0.1 | 13.6 | -8.5 | -0.1 | 15.1 | - | - | - |
| 38 | D + AD + CG + W2>+AL*> | 2.3 | 0.1 | 12.0 | -8.5 | -0.1 | 16.6 | - | - | - |
| 39 | D + AD + CG + <W2+<*AL | 8.2 | 0.1 | 16.5 | -2.4 | -0.1 | 11.9 | - | - | - |
| 40 | D + AD + CG + <W2+<AL* | 8.2 | 0.1 | 14.9 | -2.4 | -0.1 | 13.4 | - | - | - |
| 41 | D + AD + CG + E> + EG+ | 5.1 | 0.1 | 14.6 | -7.8 | -0.1 | 15.8 | - | - | - |
| 42 | D + AD + CG + <E + EG+ | 7.8 | 0.1 | 16.0 | -5.1 | -0.1 | 14.5 | - | - | - |
| 43 | D + AD + CU + E> + EG- | 0.2 | 0.0 | 4.3 | -2.9 | -0.0 | 5.7 | - | - | - |
| 44 | D + AD + CU + <E + EG- | 2.9 | 0.0 | 5.6 | -0.2 | -0.0 | 4.3 | - | - | - |
| 45 | D + AD + CG + E> + EG+ | 5.4 | 0.1 | 14.7 | -7.4 | -0.1 | 15.6 | - | - | - |
| 46 | D + AD + CG + <E + EG+ | 7.4 | 0.1 | 15.7 | -5.4 | -0.1 | 14.6 | - | - | - |
| 47 | D + AD + CG + WP + WB1> | 6.6 | -3.4 | -10.0 | -7.4 | 3.1 | -8.3 | - | - | - |
| 48 | D + AD + CU + WP + WB1> | 1.9 | -3.5 | -19.9 | -2.8 | 3.1 | -18.0 | - | - | - |
| 49 | D+AD+CG+L+WP+WB1> | 13.2 | -2.6 | 10.6 | -13.8 | 2.3 | 12.1 | - | - | - |
| 50 | D+AD+CG+S+WP+WB1> | 7.3 | -2.6 | -1.9 | -8.0 | 2.3 | -0.6 | - | - | - |
| 51 | D+AD+CG+WP+*AL+WB1>+ALB> | 7.7 | -1.3 | 8.6 | -8.0 | 1.0 | 8.1 | - | - | - |
| 52 | D+AD+CG+WP+AL*+WB1>+A | 7.7 | -1.3 | 7.0 | -8.0 | 1.0 | 9.6 | - | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LB> | | | | | | | | | |
| 53 | D + AD + CG + WP + <WB1 | 6.4 | 3.3 | 8.3 | -7.3 | -3.0 | 7.8 | - | - | - |
| 54 | D + AD + CU + WP + <WB1 | 1.8 | 3.3 | -1.6 | -2.6 | -2.9 | -1.9 | - | - | - |
| 55 | D+AD+CG+L+WP+<WB1 | 13.1 | 2.5 | 24.3 | -13.7 | -2.2 | 24.1 | - | - | - |
| 56 | D+AD+CG+S+WP+<WB1 | 7.2 | 2.5 | 11.8 | -7.9 | -2.2 | 11.4 | - | - | - |
| 57 | D+AD+CG+WP+*AL+<WB1+<ALB | 7.6 | 1.4 | 15.9 | -7.9 | -1.1 | 13.6 | - | - | - |
| 58 | D+AD+CG+WP+AL*+<WB1+<ALB | 7.6 | 1.4 | 14.4 | -7.9 | -1.1 | 15.2 | - | - | - |
| 59 | D + AD + CG + WP + WB2> | 6.5 | -1.7 | -5.0 | -7.4 | 1.7 | -4.3 | - | - | - |
| 60 | D + AD + CU + WP + WB2> | 1.9 | -1.7 | -14.9 | -2.8 | 1.7 | -14.0 | - | - | - |
| 61 | D+AD+CG+L+WP+WB2> | 13.1 | -1.2 | 14.3 | -13.8 | 1.2 | 15.1 | - | - | - |
| 62 | D+AD+CG+S+WP+WB2> | 7.3 | -1.2 | 1.8 | -8.0 | 1.2 | 2.4 | - | - | - |
| 63 | D+AD+CG+WP+*AL+WB2>+ALB> | 7.7 | -0.7 | 10.4 | -8.0 | 0.5 | 9.6 | - | - | - |
| 64 | D+AD+CG+WP+AL*+WB2>+ALB> | 7.7 | -0.7 | 8.9 | -8.0 | 0.5 | 11.1 | - | - | - |
| 65 | D + AD + CG + WP + <WB2 | 6.4 | 5.2 | 13.3 | -7.3 | -4.5 | 11.7 | - | - | - |
| 66 | D + AD + CU + WP + <WB2 | 1.7 | 5.2 | 3.4 | -2.6 | -4.5 | 2.0 | - | - | - |
| 67 | D+AD+CG+L+WP+<WB2 | 13.0 | 3.9 | 28.1 | -13.7 | -3.4 | 27.1 | - | - | - |
| 68 | D+AD+CG+S+WP+<WB2 | 7.2 | 3.9 | 15.5 | -7.9 | -3.4 | 14.4 | - | - | - |
| 69 | D+AD+CG+WP+*AL+<WB2+<ALB | 7.6 | 2.1 | 17.8 | -7.9 | -1.6 | 15.1 | - | - | - |
| 70 | D+AD+CG+WP+AL*+<WB2+<ALB | 7.6 | 2.1 | 16.2 | -7.9 | -1.6 | 16.6 | - | - | - |
| 71 | D + AD + CG + EB> + EG+ | 6.5 | -1.0 | 12.2 | -6.5 | 0.9 | 12.6 | - | - | - |
| 72 | D + AD + CU + EB> + EG- | 1.6 | -1.0 | 1.9 | -1.6 | 0.9 | 2.4 | - | - | - |
| 73 | D + AD + CG + EB> + EG+ | 6.4 | -0.7 | 12.9 | -6.4 | 0.7 | 13.2 | - | - | - |
| 74 | D + AD + CG + <EB + EG+ | 6.4 | 1.2 | 18.3 | -6.4 | -1.1 | 17.8 | - | - | - |
| 75 | D + AD + CU + <EB + EG- | 1.5 | 1.2 | 8.0 | -1.5 | -1.1 | 7.6 | - | - | - |
| 76 | D + AD + CG + <EB + EG+ | 6.4 | 0.9 | 17.5 | -6.4 | -0.8 | 17.1 | - | - | - |
| 77 | D + AD + CG+*AL+ALB> | 8.0 | -0.0 | 18.9 | -8.0 | -0.2 | 17.4 | - | - | - |
| 78 | D + AD + CG+AL*+ALB> | 8.0 | -0.0 | 16.9 | -8.0 | -0.2 | 19.5 | - | - | - |
| 79 | D+AD+CG+S+*AL+ALB> | 8.2 | -0.0 | 19.3 | -8.2 | -0.2 | 18.2 | - | - | - |
| 80 | D+AD+CG+S+AL*+ALB> | 8.2 | -0.0 | 17.8 | -8.2 | -0.2 | 19.7 | - | - | - |
| 81 | D + AD + CG+*AL+<ALB | 8.0 | 0.2 | 19.6 | -8.0 | 0.1 | 16.8 | - | - | - |
| 82 | D + AD + CG+AL*+<ALB | 8.0 | 0.2 | 17.5 | -8.0 | 0.1 | 18.8 | - | - | - |
| 83 | D+AD+CG+S+*AL+<ALB | 8.2 | 0.2 | 19.8 | -8.2 | 0.0 | 17.7 | - | - | - |
| 84 | D+AD+CG+S+AL*+<ALB | 8.2 | 0.2 | 18.3 | -8.2 | 0.0 | 19.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

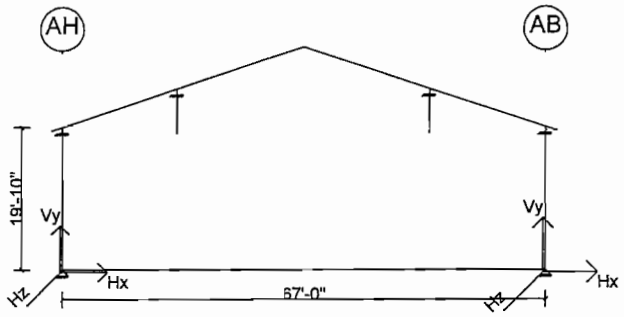
| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A6-AH | 12.2 | 13 | 15.2 | 1 | 3.5 | 48 | 5.2 | 65 | 19.9 | 48 | 34.2 | 1 | - | - | - | - |
| 67/0/0 | A6-AB | 15.2 | 1 | 11.5 | 14 | 4.5 | 65 | 3.1 | 48 | 18.0 | 48 | 34.4 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | AH-A6 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |
| 67/0/0 | AB-A6 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

**Wall: 4, Frame at: 71/4/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A7**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 67/0/0 | | | | | |
| Grid1 - Grid2 | | A7-AH | | | A7-AB | | | | | |
| Base Plate W x L (in.) | | 10 x 13 | | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | | 4 - 1.000 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 2.1 | -0.1 | 7.3 | -2.1 | 0.1 | 7.4 | - | - | - |
| AD | Frm | 0.6 | - | 1.2 | -0.6 | - | 1.2 | - | - | - |
| CG | Frm | 3.5 | - | 6.4 | -3.5 | - | 6.2 | - | - | - |
| L> | Frm | 8.9 | - | 19.2 | -8.9 | - | 19.5 | - | - | - |
| <L | Frm | 8.9 | - | 19.2 | -8.9 | - | 19.5 | - | - | - |
| S> | Frm | 1.1 | - | 2.5 | -1.1 | - | 2.5 | - | - | - |
| <S | Frm | 1.1 | - | 2.5 | -1.1 | - | 2.5 | - | - | - |
| S | Frm | 1.1 | - | 2.5 | -1.1 | - | 2.5 | - | - | - |
| SD | Frm | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - |
| US1* | Frm | 1.6 | - | 2.0 | -1.6 | - | 3.2 | - | - | - |
| *US1 | Frm | 0.7 | - | 2.0 | -0.7 | - | 1.0 | - | - | - |
| W1> | Frm | -13.9 | - | -20.2 | -1.5 | - | -12.6 | - | - | - |
| <W1 | Frm | 0.2 | - | -13.6 | 13.3 | - | -19.9 | - | - | - |
| W2> | Frm | -13.3 | - | -11.8 | -1.6 | - | -4.6 | - | - | - |
| <W2 | Frm | 0.9 | - | -5.2 | 13.1 | - | -11.9 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| *AL> | Frm | 1.3 | - | 3.9 | -2.1 | - | 2.4 | - | - | - |
| AL*> | Frm | 1.3 | - | 1.8 | -2.1 | - | 4.5 | - | - | - |
| <*AL | Frm | 2.1 | - | 4.5 | -1.3 | - | 1.8 | - | - | - |
| <AL* | Frm | 2.1 | - | 2.4 | -1.3 | - | 3.9 | - | - | - |
| L | Frm | 8.9 | - | 19.2 | -8.9 | - | 19.5 | - | - | - |
| E> | Frm | -1.9 | - | -1.0 | -1.9 | - | 1.0 | - | - | - |
| EG+ | Frm | 0.2 | - | 0.3 | -0.2 | - | 0.3 | - | - | - |
| <E | Frm | 1.9 | - | 1.0 | 1.9 | - | -1.0 | - | - | - |
| EG- | Frm | -0.2 | - | -0.3 | 0.2 | - | -0.3 | - | - | - |
| WP | Frm | -0.5 | - | -16.7 | -0.5 | - | -16.1 | - | - | - |
| WB1> | Brc | -0.1 | -3.8 | 9.9 | 0.1 | 3.4 | 8.6 | - | - | - |
| *AL | Frm | 1.7 | - | 4.2 | -1.7 | - | 2.1 | - | - | - |
| ALB> | Brc | - | -0.1 | 0.3 | - | -0.1 | -0.3 | - | - | - |
| AL* | Frm | 1.7 | - | 2.1 | -1.7 | - | 4.2 | - | - | - |
| <WB1 | Brc | 0.1 | 3.0 | -8.4 | -0.1 | -2.8 | -7.4 | - | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| <ALB | Brc | - | 0.1 | -0.3 | - | 0.1 | 0.3 | - | - | - |
| WB2> | Brc | -0.1 | -1.9 | 4.9 | 0.1 | 1.8 | 4.6 | - | - | - |
| <WB2 | Brc | 0.1 | 4.8 | -13.4 | -0.1 | -4.2 | -11.4 | - | - | - |
| EB> | Brc | -0.0 | -1.7 | 4.4 | 0.0 | 1.5 | 3.7 | - | - | - |
| <EB | Brc | 0.0 | 1.6 | -4.4 | -0.0 | -1.4 | -3.7 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A7**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | | 67/0/0 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | A7-AH | | | A7-AB | | | | | |
| Ld | Description | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | | | |
| 1 | D + AD + CG + L> | 15.2 | -0.1 | 34.2 | -15.2 | 0.1 | 34.4 | - | - | - |
| 2 | D + AD + CG + <L | 15.2 | -0.1 | 34.2 | -15.2 | 0.1 | 34.4 | - | - | - |
| 3 | D + AD + CG + S> | 7.4 | -0.1 | 17.4 | -7.4 | 0.1 | 17.4 | - | - | - |
| 4 | D + AD + CG + <S | 7.4 | -0.1 | 17.4 | -7.4 | 0.1 | 17.4 | - | - | - |
| 5 | D + AD + CG + S + SD | 7.4 | -0.1 | 17.4 | -7.4 | 0.1 | 17.4 | - | - | - |
| 6 | D + AD + CG + S + SS | 7.4 | -0.1 | 17.4 | -7.4 | 0.1 | 17.4 | - | - | - |
| 7 | D + AD + CG + US1* | 7.9 | -0.1 | 17.0 | -7.9 | 0.1 | 18.0 | - | - | - |
| 8 | D + AD + CG + *US1 | 7.0 | -0.1 | 17.0 | -7.0 | 0.1 | 15.9 | - | - | - |
| 9 | D + AD + CG + W1> | -7.6 | -0.1 | -5.2 | -7.8 | 0.1 | 2.3 | - | - | - |
| 10 | D + AD + CG + <W1 | 6.5 | -0.1 | 1.4 | 7.0 | 0.1 | -5.0 | - | - | - |
| 11 | D + AD + CG + W2> | -7.0 | -0.1 | 3.1 | -7.9 | 0.1 | 10.3 | - | - | - |
| 12 | D + AD + CG + <W2 | 7.2 | -0.1 | 9.8 | 6.8 | 0.1 | 3.0 | - | - | - |
| 13 | D + AD + CU + W1> | -12.2 | -0.0 | -15.1 | -3.2 | 0.0 | -7.4 | - | - | - |
| 14 | D + AD + CU + <W1 | 1.9 | -0.0 | -8.4 | 11.6 | 0.0 | -14.7 | - | - | - |
| 15 | D + AD + CU + W2> | -11.6 | -0.0 | -6.7 | -3.3 | 0.0 | 0.6 | - | - | - |
| 16 | D + AD + CU + <W2 | 2.5 | -0.0 | -0.1 | 11.5 | 0.0 | -6.7 | - | - | - |
| 17 | D + AD + CG+*AL> | 7.6 | -0.1 | 18.9 | -8.4 | 0.1 | 17.3 | - | - | - |
| 18 | D + AD + CG+AL*> | 7.6 | -0.1 | 16.8 | -8.4 | 0.1 | 19.4 | - | - | - |
| 19 | D + AD + CG+<*AL | 8.4 | -0.1 | 19.5 | -7.6 | 0.1 | 16.7 | - | - | - |
| 20 | D + AD + CG+<AL* | 8.4 | -0.1 | 17.4 | -7.6 | 0.1 | 18.8 | - | - | - |
| 21 | D + AD + CG + L + W1> | 2.6 | -0.1 | 14.3 | -14.1 | 0.1 | 20.1 | - | - | - |
| 22 | D + AD + CG + L + <W1 | 13.1 | -0.1 | 19.2 | -3.0 | 0.1 | 14.6 | - | - | - |
| 23 | D + AD + CG + L + W2> | 3.0 | -0.1 | 20.5 | -14.2 | 0.1 | 26.1 | - | - | - |
| 24 | D + AD + CG + L + <W2 | 13.6 | -0.1 | 25.5 | -3.1 | 0.1 | 20.6 | - | - | - |
| 25 | D + AD + CG + S + W1> | -3.3 | -0.1 | 1.7 | -8.3 | 0.1 | 7.3 | - | - | - |
| 26 | D + AD + CG + S + <W1 | 7.3 | -0.1 | 6.7 | 2.8 | 0.1 | 1.8 | - | - | - |
| 27 | D + AD + CG + S + W2> | -2.8 | -0.1 | 7.9 | -8.4 | 0.1 | 13.3 | - | - | - |
| 28 | D + AD + CG + S + <W2 | 7.8 | -0.1 | 12.9 | 2.7 | 0.1 | 7.8 | - | - | - |
| 29 | D + AD + CG + S+*AL> | 7.9 | -0.1 | 19.3 | -8.5 | 0.1 | 18.1 | - | - | - |
| 30 | D + AD + CG + S+AL*> | 7.9 | -0.1 | 17.7 | -8.5 | 0.1 | 19.7 | - | - | - |
| 31 | D + AD + CG + S+<*AL | 8.5 | -0.1 | 19.7 | -7.9 | 0.1 | 17.6 | - | - | - |
| 32 | D + AD + CG + S+<AL* | 8.5 | -0.1 | 18.2 | -7.9 | 0.1 | 19.2 | - | - | - |
| 33 | D + AD + CG + W1>+*AL> | 2.0 | -0.1 | 10.3 | -8.4 | 0.1 | 12.0 | - | - | - |
| 34 | D + AD + CG + W1>+AL*> | 2.0 | -0.1 | 8.8 | -8.4 | 0.1 | 13.5 | - | - | - |
| 35 | D + AD + CG + <W1+<*AL | 7.9 | -0.1 | 13.3 | -2.3 | 0.1 | 8.8 | - | - | - |
| 36 | D + AD + CG + <W1+<AL* | 7.9 | -0.1 | 11.7 | -2.3 | 0.1 | 10.3 | - | - | - |
| 37 | D + AD + CG + W2>+*AL> | 2.3 | -0.1 | 13.5 | -8.5 | 0.1 | 15.0 | - | - | - |
| 38 | D + AD + CG + W2>+AL*> | 2.3 | -0.1 | 11.9 | -8.5 | 0.1 | 16.5 | - | - | - |
| 39 | D + AD + CG + <W2+<*AL | 8.2 | -0.1 | 16.4 | -2.3 | 0.1 | 11.8 | - | - | - |
| 40 | D + AD + CG + <W2+<AL* | 8.2 | -0.1 | 14.9 | -2.3 | 0.1 | 13.3 | - | - | - |
| 41 | D + AD + CG + E> + EG+ | 5.1 | -0.1 | 14.5 | -7.8 | 0.1 | 15.8 | - | - | - |
| 42 | D + AD + CG + <E + EG+ | 7.8 | -0.1 | 15.9 | -5.1 | 0.1 | 14.4 | - | - | - |
| 43 | D + AD + CU + E> + EG- | 0.2 | -0.0 | 4.2 | -2.9 | 0.0 | 5.6 | - | - | - |
| 44 | D + AD + CU + <E + EG- | 2.9 | -0.0 | 5.6 | -0.2 | 0.0 | 4.3 | - | - | - |
| 45 | D + AD + CG + E> + EG+ | 5.4 | -0.1 | 14.7 | -7.4 | 0.1 | 15.5 | - | - | - |
| 46 | D + AD + CG + <E + EG+ | 7.4 | -0.1 | 15.7 | -5.4 | 0.1 | 14.5 | - | - | - |
| 47 | D + AD + CG + WP + WB1> | 5.7 | -3.8 | 8.1 | -6.7 | 3.4 | 7.4 | - | - | - |
| 48 | D + AD + CU + WP + WB1> | 1.1 | -3.8 | -1.7 | -2.1 | 3.4 | -2.3 | - | - | - |
| 49 | D+AD+CG+L+WP+WB1> | 12.5 | -2.9 | 24.3 | -13.3 | 2.6 | 23.9 | - | - | - |
| 50 | D+AD+CG+S+WP+WB1> | 6.7 | -2.9 | 11.7 | -7.4 | 2.6 | 11.1 | - | - | - |
| 51 | D+AD+CG+WP+*AL+WB1>+ALB> | 7.3 | -1.6 | 15.8 | -7.7 | 1.2 | 13.4 | - | - | - |
| 52 | D+AD+CG+WP+AL*+WB1>+A | 7.3 | -1.6 | 14.3 | -7.7 | 1.2 | 15.0 | - | - | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | LB> | | | | | | | | | |
| 53 | D + AD + CG + WP + <WB1 | 5.9 | 2.9 | -10.2 | -6.9 | -2.7 | -8.7 | - | - | - |
| 54 | D + AD + CU + WP + <WB1 | 1.3 | 3.0 | -20.0 | -2.2 | -2.7 | -18.4 | - | - | - |
| 55 | D+AD+CG+L+WP+<WB1 | 12.7 | 2.2 | 10.5 | -13.4 | -2.0 | 11.9 | - | - | - |
| 56 | D+AD+CG+S+WP+<WB1 | 6.8 | 2.2 | -2.1 | -7.6 | -2.0 | -0.9 | - | - | - |
| 57 | D+AD+CG+WP+*AL+<WB1+<ALB | 7.4 | 1.1 | 8.5 | -7.8 | -0.9 | 7.9 | - | - | - |
| 58 | D+AD+CG+WP+AL*+<WB1+<ALB | 7.4 | 1.1 | 6.9 | -7.8 | -0.9 | 9.4 | - | - | - |
| 59 | D + AD + CG + WP + WB2> | 5.8 | -1.9 | 3.1 | -6.8 | 1.9 | 3.4 | - | - | - |
| 60 | D + AD + CU + WP + WB2> | 1.1 | -1.9 | -6.7 | -2.1 | 1.9 | -6.3 | - | - | - |
| 61 | D+AD+CG+L+WP+WB2> | 12.6 | -1.5 | 20.5 | -13.3 | 1.4 | 20.9 | - | - | - |
| 62 | D+AD+CG+S+WP+WB2> | 6.7 | -1.5 | 7.9 | -7.5 | 1.4 | 8.1 | - | - | - |
| 63 | D+AD+CG+WP+*AL+WB2>+ALB> | 7.4 | -0.9 | 13.9 | -7.7 | 0.7 | 11.9 | - | - | - |
| 64 | D+AD+CG+WP+AL*+WB2>+ALB> | 7.4 | -0.9 | 12.4 | -7.7 | 0.7 | 13.5 | - | - | - |
| 65 | D + AD + CG + WP + <WB2 | 6.0 | 4.7 | -15.2 | -6.9 | -4.2 | -12.6 | - | - | - |
| 66 | D + AD + CU + WP + <WB2 | 1.3 | 4.7 | -25.0 | -2.3 | -4.2 | -22.3 | - | - | - |
| 67 | D+AD+CG+L+WP+<WB2 | 12.7 | 3.5 | 6.8 | -13.5 | -3.1 | 8.9 | - | - | - |
| 68 | D+AD+CG+S+WP+<WB2 | 6.9 | 3.5 | -5.8 | -7.6 | -3.1 | -3.9 | - | - | - |
| 69 | D+AD+CG+WP+*AL+<WB2+<ALB | 7.4 | 1.8 | 6.6 | -7.8 | -1.4 | 6.4 | - | - | - |
| 70 | D+AD+CG+WP+AL*+<WB2+<ALB | 7.4 | 1.8 | 5.0 | -7.8 | -1.4 | 8.0 | - | - | - |
| 71 | D + AD + CG + EB> + EG+ | 6.4 | -1.2 | 18.3 | -6.4 | 1.1 | 17.7 | - | - | - |
| 72 | D + AD + CU + EB> + EG- | 1.5 | -1.2 | 7.9 | -1.5 | 1.1 | 7.6 | - | - | - |
| 73 | D + AD + CG + EB> + EG+ | 6.4 | -0.9 | 17.4 | -6.4 | 0.8 | 17.0 | - | - | - |
| 74 | D + AD + CG + <EB + EG+ | 6.4 | 1.0 | 12.2 | -6.4 | -0.9 | 12.5 | - | - | - |
| 75 | D + AD + CU + <EB + EG- | 1.6 | 1.0 | 1.8 | -1.6 | -0.9 | 2.3 | - | - | - |
| 76 | D + AD + CG + <EB + EG+ | 6.4 | 0.7 | 12.9 | -6.4 | -0.7 | 13.1 | - | - | - |
| 77 | D + AD + CG+*AL+ALB> | 8.0 | -0.2 | 19.5 | -8.0 | -0.1 | 16.7 | - | - | - |
| 78 | D + AD + CG+AL*+ALB> | 8.0 | -0.2 | 17.4 | -8.0 | -0.1 | 18.8 | - | - | - |
| 79 | D+AD+CG+S+*AL+ALB> | 8.2 | -0.2 | 19.8 | -8.2 | -0.0 | 17.6 | - | - | - |
| 80 | D+AD+CG+S+AL*+ALB> | 8.2 | -0.2 | 18.2 | -8.2 | -0.0 | 19.2 | - | - | - |
| 81 | D + AD + CG+*AL+<ALB | 8.0 | 0.0 | 18.9 | -8.0 | 0.2 | 17.3 | - | - | - |
| 82 | D + AD + CG+AL*+<ALB | 8.0 | 0.0 | 16.8 | -8.0 | 0.2 | 19.4 | - | - | - |
| 83 | D+AD+CG+S+*AL+<ALB | 8.2 | 0.0 | 19.3 | -8.2 | 0.2 | 18.1 | - | - | - |
| 84 | D+AD+CG+S+AL*+<ALB | 8.2 | 0.0 | 17.7 | -8.2 | 0.2 | 19.7 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A7-AH | 12.2 | 13 | 15.2 | 1 | 3.8 | 47 | 4.7 | 66 | 25.0 | 66 | 34.2 | 1 | - | - | - | - |
| 67/0/0 | A7-AB | 15.2 | 1 | 11.6 | 14 | 4.2 | 66 | 3.4 | 47 | 22.3 | 66 | 34.4 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | AH-A7 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |
| 67/0/0 | AB-A7 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

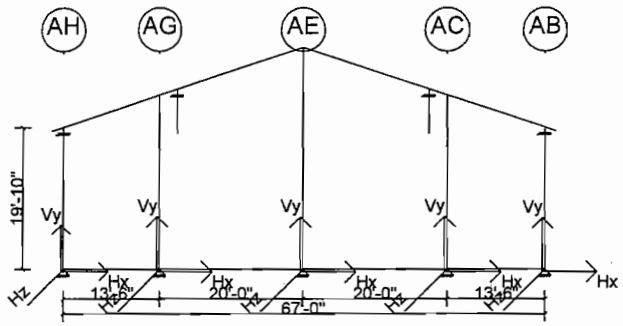
## Wall: 4, Frame at: 101/8/0

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 L> | D + AD + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <L | D + AD + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S> | D + AD + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <S | D + AD + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SD | D + AD + CG + S + SD |
| 6 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 S + 1.0 SS | D + AD + CG + S + SS |
| 7 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 US1* | D + AD + CG + US1* |
| 8 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *US1 | D + AD + CG + *US1 |
| 9 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W1> | D + AD + CG + W1> |
| 10 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W1 | D + AD + CG + <W1 |
| 11 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 W2> | D + AD + CG + W2> |
| 12 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <W2 | D + AD + CG + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 WP | D + AD + CG + WP |
| 14 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W1> | D + AD + CU + W1> |
| 15 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W1 | D + AD + CU + <W1 |
| 16 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 W2> | D + AD + CU + W2> |
| 17 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 <W2 | D + AD + CU + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 1.0 WP | D + AD + CU + WP |
| 19 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 *AL> | D + AD + CG+*AL> |
| 20 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 AL*> | D + AD + CG+AL*> |
| 21 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <*AL | D + AD + CG+<*AL |
| 22 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 1.0 <AL* | D + AD + CG+<AL* |
| 23 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W1> | D + AD + CG + L + W1> |
| 24 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W1 | D + AD + CG + L + <W1 |
| 25 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 W2> | D + AD + CG + L + W2> |
| 26 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 <W2 | D + AD + CG + L + <W2 |
| 27 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 L + 0.750 WP | D + AD + CG + L + WP |
| 28 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W1> | D + AD + CG + S + W1> |
| 29 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W1 | D + AD + CG + S + <W1 |
| 30 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 W2> | D + AD + CG + S + W2> |
| 31 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 <W2 | D + AD + CG + S + <W2 |
| 32 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.750 S + 0.750 WP | D + AD + CG + S + WP |
| 33 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 *AL> | D + AD + CG + S+*AL> |
| 34 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 AL*> | D + AD + CG + S+AL*> |
| 35 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <*AL | D + AD + CG + S+<*AL |
| 36 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.563 S + 0.750 <AL* | D + AD + CG + S+<AL* |
| 37 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 *AL> | D + AD + CG + W1>+*AL> |
| 38 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W1> + 0.750 AL*> | D + AD + CG + W1>+AL*> |
| 39 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <*AL | D + AD + CG + <W1+<*AL |
| 40 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W1 + 0.750 <AL* | D + AD + CG + <W1+<AL* |
| 41 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 *AL> | D + AD + CG + W2>+*AL> |
| 42 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 W2> + 0.750 AL*> | D + AD + CG + W2>+AL*> |
| 43 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <*AL | D + AD + CG + <W2+<*AL |
| 44 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 <W2 + 0.750 <AL* | D + AD + CG + <W2+<AL* |
| 45 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 *AL> | D + AD + CG + WP+*AL> |
| 46 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 AL*> | D + AD + CG + WP+AL*> |
| 47 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 <*AL | D + AD + CG + WP+<*AL |
| 48 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.375 WP + 0.750 <AL* | D + AD + CG + WP+<AL* |
| 49 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 E> + 0.700 EG+ | D + AD + CG + E> + EG+ |
| 50 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.700 <E + 0.700 EG+ | D + AD + CG + <E + EG+ |
| 51 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 E> + 0.700 EG- | D + AD + CU + E> + EG- |
| 52 | System | 1.000 | 0.600 D + 0.600 AD + 0.600 CU + 0.700 <E + 0.700 EG- | D + AD + CU + <E + EG- |
| 53 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 E> + 0.525 EG+ | D + AD + CG + E> + EG+ |
| 54 | System | 1.000 | 1.0 D + 1.0 AD + 1.0 CG + 0.525 <E + 0.525 EG+ | D + AD + CG + <E + EG+ |

**Wall: 4, Frame at: 101/8/0**
Frame ID:CB1 EP

Frame Type:Continuous Beam, End Posts




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: A8**

| Type | | Exterior Column | | Interior Column | | | Interior Column | | | Interior Column | | | Exterior Column | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 13/6/0 | | | 33/6/0 | | | 53/6/0 | | | 67/0/0 | |
| Grid1 - Grid2 | | A8-AH | | A8-AG | | | A8-AE | | | A8-AC | | | A8-AB | |
| Base Plate W x L (in.) | | 8 x 13 | | 8 x 9 | | | 10 x 13 | | | 8 x 9 | | | 8 x 13 | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | 0.375 | | | 0.375 | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | 100'-0" | | | 100'-0" | | | 100'-0" | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy |
| D | Frm | 0.3 | 2.0 | - | - | 0.6 | - | - | 3.7 | - | - | 0.6 | -0.3 | 2.0 |
| AD | Frm | 0.1 | 0.3 | - | - | - | - | - | 0.7 | - | - | - | -0.1 | 0.3 |
| CG | Frm | 0.3 | 1.6 | - | - | - | - | - | 4.3 | - | - | - | -0.3 | 1.5 |
| L> | Frm | 1.1 | 6.0 | - | - | - | - | - | 10.8 | - | - | - | -1.1 | 6.2 |
| <L | Frm | 1.1 | 6.0 | - | - | - | - | - | 10.8 | - | - | - | -1.1 | 6.2 |
| S> | Frm | 0.1 | 0.8 | - | - | - | - | - | 1.4 | - | - | - | -0.1 | 0.8 |
| <S | Frm | 0.1 | 0.8 | - | - | - | - | - | 1.4 | - | - | - | -0.1 | 0.8 |
| S | Frm | 0.1 | 0.8 | - | - | - | - | - | 1.4 | - | - | - | -0.1 | 0.8 |
| SD | Frm | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SS | Frm | - | - | - | - | - | - | - | - | - | - | - | - | - |
| US1* | Frm | 0.1 | 0.2 | - | - | - | - | - | 2.0 | - | - | - | -0.1 | 0.9 |
| *US1 | Frm | 0.1 | 0.8 | - | - | - | - | - | 0.9 | - | - | - | -0.1 | 0.2 |
| W1> | Frm | -4.7 | -8.2 | - | 5.2 | - | - | 7.0 | -8.3 | - | 5.2 | - | -3.1 | -3.7 |
| <W1 | Frm | 2.6 | -4.0 | - | -4.7 | - | - | -6.3 | -8.6 | - | -4.7 | - | 4.2 | -7.8 |
| W2> | Frm | -5.3 | -4.9 | - | - | - | - | - | -5.7 | - | - | - | -2.3 | -0.7 |
| <W2 | Frm | 2.0 | -0.8 | - | - | - | - | - | -6.1 | - | - | - | 5.0 | -4.8 |
| WP | Frm | 0.8 | -8.9 | - | - | - | - | - | -8.0 | - | - | - | -1.5 | -8.5 |
| CU | Frm | - | - | - | - | - | - | - | - | - | - | - | - | - |
| *AL> | Frm | 0.1 | 2.3 | - | - | - | - | - | 3.3 | - | - | - | -0.9 | 0.8 |
| AL*> | Frm | 0.1 | 0.2 | - | - | - | - | - | 3.3 | - | - | - | -0.9 | 2.9 |
| <*AL | Frm | 0.9 | 2.9 | - | - | - | - | - | 3.3 | - | - | - | -0.1 | 0.2 |
| <AL* | Frm | 0.9 | 0.8 | - | - | - | - | - | 3.3 | - | - | - | -0.1 | 2.3 |
| L | Frm | 1.1 | 6.0 | - | - | - | - | - | 10.8 | - | - | - | -1.1 | 6.2 |
| E> | Frm | -1.1 | -0.5 | - | 0.4 | - | - | 0.6 | - | - | 0.4 | - | -1.1 | 0.5 |
| EG+ | Frm | 0.0 | 0.1 | - | - | - | - | - | 0.2 | - | - | - | -0.0 | 0.1 |
| <E | Frm | 1.1 | 0.5 | - | -0.4 | - | - | -0.6 | - | - | -0.4 | - | 1.1 | -0.5 |
| EG- | Frm | -0.0 | -0.1 | - | - | - | - | - | -0.2 | - | - | - | 0.0 | -0.1 |

**Frame Reactions - Factored Load Cases at Frame Cross Section: A8**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | 13/6/0 | 33/6/0 | 53/6/0 | 67/0/0 |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | A8-AH | | A8-AG | | | A8-AE | | | A8-AC | | | A8-AB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) | (k) |
| 1 | D + AD + CG + L> | 1.7 | 9.9 | - | - | 0.6 | - | - | 19.5 | - | - | 0.6 | -1.7 | 10.0 |
| 2 | D + AD + CG + <L | 1.7 | 9.9 | - | - | 0.6 | - | - | 19.5 | - | - | 0.6 | -1.7 | 10.0 |
| 3 | D + AD + CG + S> | 0.8 | 4.7 | - | - | 0.6 | - | - | 10.0 | - | - | 0.6 | -0.8 | 4.6 |
| 4 | D + AD + CG + <S | 0.8 | 4.7 | - | - | 0.6 | - | - | 10.0 | - | - | 0.6 | -0.8 | 4.6 |
| 5 | D + AD + CG + S + SD | 0.8 | 4.7 | - | - | 0.6 | - | - | 10.0 | - | - | 0.6 | -0.8 | 4.6 |
| 6 | D + AD + CG + S + SS | 0.8 | 4.7 | - | - | 0.6 | - | - | 10.0 | - | - | 0.6 | -0.8 | 4.6 |
| 7 | D + AD + CG + US1* | 0.7 | 4.1 | - | - | 0.6 | - | - | 10.7 | - | - | 0.6 | -0.7 | 4.7 |
| 8 | D + AD + CG + *US1 | 0.7 | 4.7 | - | - | 0.6 | - | - | 9.6 | - | - | 0.6 | -0.7 | 4.0 |
| 9 | D + AD + CG + W1> | -4.1 | -4.2 | - | 5.2 | 0.6 | - | 7.0 | 0.4 | - | 5.2 | 0.6 | -3.7 | 0.1 |
| 10 | D + AD + CG + <W1 | 3.2 | -0.1 | - | -4.7 | 0.6 | - | -6.3 | 0.0 | - | -4.7 | 0.6 | 3.6 | -4.0 |
| 11 | D + AD + CG + W2> | -4.6 | -1.0 | - | - | 0.6 | - | - | 3.0 | - | - | 0.6 | -2.9 | 3.1 |
| 12 | D + AD + CG + <W2 | 2.7 | 3.1 | - | - | 0.6 | - | - | 2.6 | - | - | 0.6 | 4.4 | -1.0 |
| 13 | D + AD + CG + WP | 1.4 | -5.0 | - | - | 0.6 | - | - | 0.7 | - | - | 0.6 | -2.1 | -4.7 |
| 14 | D + AD + CU + W1> | -4.5 | -6.8 | - | 5.2 | 0.4 | - | 7.0 | -5.6 | - | 5.2 | 0.4 | -3.3 | -2.3 |
| 15 | D + AD + CU + <W1 | 2.8 | -2.6 | - | -4.7 | 0.4 | - | -6.3 | -6.0 | - | -4.7 | 0.4 | 4.0 | -6.4 |
| 16 | D + AD + CU + W2> | -5.0 | -3.6 | - | - | 0.4 | - | - | -3.1 | - | - | 0.4 | -2.5 | 0.7 |
| 17 | D + AD + CU + <W2 | 2.3 | 0.6 | - | - | 0.4 | - | - | -3.4 | - | - | 0.4 | 4.8 | -3.4 |
| 18 | D + AD + CU + WP | 1.0 | -7.5 | - | - | 0.4 | - | - | -5.4 | - | - | 0.4 | -1.7 | -7.1 |
| 19 | D + AD + CG+*AL> | 0.7 | 6.2 | - | - | 0.6 | - | - | 12.0 | - | - | 0.6 | -1.5 | 4.6 |
| 20 | D + AD + CG+AL*> | 0.7 | 4.1 | - | - | 0.6 | - | - | 12.0 | - | - | 0.6 | -1.5 | 6.7 |
| 21 | D + AD + CG+<*AL | 1.5 | 6.8 | - | - | 0.6 | - | - | 12.0 | - | - | 0.6 | -0.7 | 4.0 |
| 22 | D + AD + CG+<AL* | 1.5 | 4.7 | - | - | 0.6 | - | - | 12.0 | - | - | 0.6 | -0.7 | 6.1 |
| 23 | D + AD + CG + L + W1> | -2.1 | 2.3 | - | 3.9 | 0.6 | - | 5.3 | 10.6 | - | 3.9 | 0.6 | -3.7 | 5.7 |
| 24 | D + AD + CG + L + <W1 | 3.3 | 5.4 | - | -3.5 | 0.6 | - | -4.7 | 10.3 | - | -3.5 | 0.6 | 1.7 | 2.6 |
| 25 | D + AD + CG + L + W2> | -2.5 | 4.7 | - | - | 0.6 | - | - | 12.5 | - | - | 0.6 | -3.1 | 7.9 |
| 26 | D + AD + CG + L + <W2 | 3.0 | 7.8 | - | - | 0.6 | - | - | 12.2 | - | - | 0.6 | 2.3 | 4.8 |
| 27 | D + AD + CG + L + WP | 2.0 | 1.7 | - | - | 0.6 | - | - | 10.8 | - | - | 0.6 | -2.5 | 2.1 |
| 28 | D + AD + CG + S + W1> | -2.8 | -1.6 | - | 3.9 | 0.6 | - | 5.3 | 3.5 | - | 3.9 | 0.6 | -3.0 | 1.6 |
| 29 | D + AD + CG + S + <W1 | 2.6 | 1.5 | - | -3.5 | 0.6 | - | -4.7 | 3.2 | - | -3.5 | 0.6 | 2.4 | -1.5 |
| 30 | D + AD + CG + S + W2> | -3.2 | 0.8 | - | - | 0.6 | - | - | 5.4 | - | - | 0.6 | -2.4 | 3.9 |
| 31 | D + AD + CG + S + <W2 | 2.3 | 3.9 | - | - | 0.6 | - | - | 5.1 | - | - | 0.6 | 3.0 | 0.8 |
| 32 | D + AD + CG + S + WP | 1.3 | -2.2 | - | - | 0.6 | - | - | 3.7 | - | - | 0.6 | -1.8 | -1.9 |
| 33 | D + AD + CG + S+*AL> | 0.8 | 6.0 | - | - | 0.6 | - | - | 11.9 | - | - | 0.6 | -1.4 | 4.8 |
| 34 | D + AD + CG + S+AL*> | 0.8 | 4.5 | - | - | 0.6 | - | - | 11.9 | - | - | 0.6 | -1.4 | 6.4 |
| 35 | D + AD + CG + S+<*AL | 1.4 | 6.5 | - | - | 0.6 | - | - | 11.9 | - | - | 0.6 | -0.8 | 4.4 |
| 36 | D + AD + CG + S+<AL* | 1.4 | 4.9 | - | - | 0.6 | - | - | 11.9 | - | - | 0.6 | -0.8 | 5.9 |
| 37 | D + AD + CG + W1>+*AL> | -1.1 | 2.6 | - | 2.0 | 0.6 | - | 2.6 | 8.0 | - | 2.0 | 0.6 | -2.5 | 3.0 |
| 38 | D + AD + CG + W1>+AL*> | -1.1 | 1.0 | - | 2.0 | 0.6 | - | 2.6 | 8.0 | - | 2.0 | 0.6 | -2.5 | 4.6 |
| 39 | D + AD + CG + <W1+<*AL | 2.3 | 4.5 | - | -1.8 | 0.6 | - | -2.4 | 7.9 | - | -1.8 | 0.6 | 0.9 | 1.0 |
| 40 | D + AD + CG + <W1+<AL* | 2.3 | 3.0 | - | -1.8 | 0.6 | - | -2.4 | 7.9 | - | -1.8 | 0.6 | 0.9 | 2.6 |
| 41 | D + AD + CG + W2>+*AL> | -1.3 | 3.8 | - | - | 0.6 | - | - | 9.0 | - | - | 0.6 | -2.2 | 4.1 |
| 42 | D + AD + CG + W2>+AL*> | -1.3 | 2.2 | - | - | 0.6 | - | - | 9.0 | - | - | 0.6 | -2.2 | 5.7 |
| 43 | D + AD + CG + <W2+<*AL | 2.1 | 5.8 | - | - | 0.6 | - | - | 8.9 | - | - | 0.6 | 1.2 | 2.2 |
| 44 | D + AD + CG + <W2+<AL* | 2.1 | 4.2 | - | - | 0.6 | - | - | 8.9 | - | - | 0.6 | 1.2 | 3.7 |
| 45 | D + AD + CG + WP+*AL> | 1.0 | 2.3 | - | - | 0.6 | - | - | 8.1 | - | - | 0.6 | -1.9 | 1.2 |
| 46 | D + AD + CG + WP+AL*> | 1.0 | 0.7 | - | - | 0.6 | - | - | 8.1 | - | - | 0.6 | -1.9 | 2.8 |
| 47 | D + AD + CG + WP+<*AL | 1.6 | 2.7 | - | - | 0.6 | - | - | 8.1 | - | - | 0.6 | -1.3 | 0.8 |
| 48 | D + AD + CG + WP+<AL* | 1.6 | 1.2 | - | - | 0.6 | - | - | 8.1 | - | - | 0.6 | -1.3 | 2.3 |
| 49 | D + AD + CG + E> + EG+ | -0.1 | 3.6 | - | 0.3 | 0.6 | - | 0.4 | 8.8 | - | 0.3 | 0.6 | -1.4 | 4.2 |
| 50 | D + AD + CG + <E + EG+ | 1.4 | 4.3 | - | -0.3 | 0.6 | - | -0.4 | 8.8 | - | -0.3 | 0.6 | 0.1 | 3.5 |
| 51 | D + AD + CU + E> + EG- | -0.5 | 1.0 | - | 0.3 | 0.4 | - | 0.4 | 2.5 | - | 0.3 | 0.4 | -1.0 | 1.7 |
| 52 | D + AD + CU + <E + EG- | 1.0 | 1.7 | - | -0.3 | 0.4 | - | -0.4 | 2.5 | - | -0.3 | 0.4 | 0.5 | 0.9 |
| 53 | D + AD + CG + E> + EG+ | 0.1 | 3.7 | - | 0.2 | 0.6 | - | 0.3 | 8.8 | - | 0.2 | 0.6 | -1.2 | 4.1 |
| 54 | D + AD + CG + <E + EG+ | 1.2 | 4.2 | - | -0.2 | 0.6 | - | -0.3 | 8.8 | - | -0.2 | 0.6 | -0.1 | 3.6 |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | A8-AH | 5.0 | 16 | 3.3 | 24 | - | - | - | - | 7.5 | 18 | 9.9 | 1 | - | - | - | - |
| 13/6/0 | A8-AG | - | - | - | - | 4.7 | 10 | 5.2 | 9 | - | - | 0.6 | 1 | - | - | - | - |

## Shape: Boat Storage Building

**Loads and Codes - Shape: Boat Storage Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.663)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: 12/4/2
Parts / Portions Zone Strip Width: 4/8/6
Basic Wind Pressure: 24.37,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3050
Bracing Seismic Period: 0.1877
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

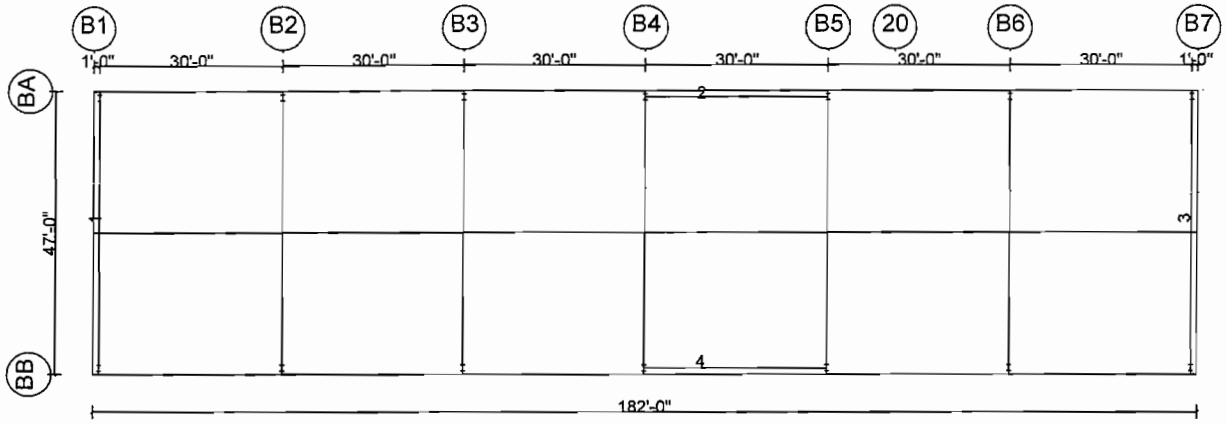
Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**User Applied Surface Loads (Local Coordinate System)**

| Side | Shape | Units | Type | Description | Mag | X-Loc | Y-Loc | Frm | Brc | Grt | Pur | Pnl | Supp. | Dir. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | LN | plf | CG | Clerestory | 35.00 | 0/0/0 | -0/2/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 182/0/0 | -0/2/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 0/0/0 | -6/0/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 35.00 | 182/0/0 | -6/0/0 | Y | N | N | N | N | N | IN | OF |

**Overall Shape Description**

| Roof 1 | Roof 2 | From Grid | To Grid | Width | Length | Eave Ht. | Eave Ht. 2 | Pitch | Pitch 2 | Dist. to Ridge | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | A1- | A1-AM | 47/0/0 | 182/0/0 | 19/9/8 | 19/9/8 | 5.000:12 | 5.000:12 | 23/6/0 | 29/7/0 |


B1
B2
B3
B4
B5
20
B6
B7
1'-0"
30'-0"
30'-0"
30'-0"
30'-0"
30'-0"
30'-0"
1'-0"
BA
BB
47'-0"
2
3
4
182'-0"

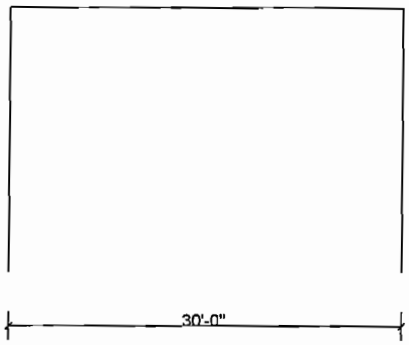
## Wall: 2

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Wall: 2**
Frame ID:Portal Frame

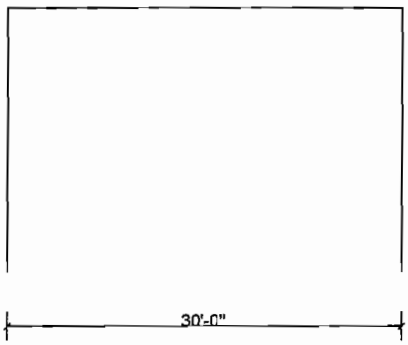
Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

**Wall: 4**
Frame ID:Portal Frame

Frame Type:Portal Frame




This is a flush portal frame and applicable reactions are shown with the main frame.

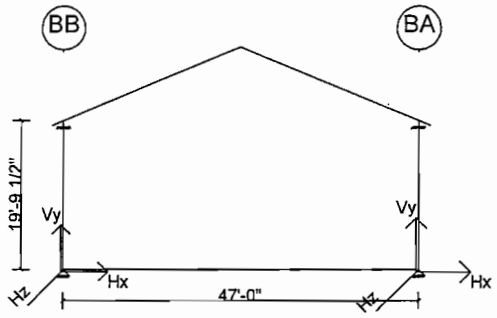
**Wall: 4, Frame at: 1/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 29 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 31 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Wall: 4, Frame at: 1/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B1**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
| Grid1 - Grid2 | | B1-BB | | B1-BA | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | 8 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.7 | 2.8 | -0.7 | 2.7 | - | - | - |
| CG | Frm | 1.1 | 2.8 | -1.1 | 2.7 | - | - | - |
| L> | Frm | 2.5 | 7.8 | -2.5 | 8.0 | - | - | - |
| <L | Frm | 2.5 | 7.8 | -2.5 | 8.0 | - | - | - |
| S> | Frm | 0.3 | 0.9 | -0.3 | 0.9 | - | - | - |
| <S | Frm | 0.3 | 0.9 | -0.3 | 0.9 | - | - | - |
| US1* | Frm | 0.4 | 0.7 | -0.4 | 1.2 | - | - | - |
| *US1 | Frm | 0.2 | 0.8 | -0.2 | 0.4 | - | - | - |
| W1> | Frm | -5.9 | -7.9 | -3.2 | -3.9 | - | - | - |
| <W1 | Frm | 2.5 | -4.2 | 5.2 | -7.6 | - | - | - |
| W2> | Frm | -6.5 | -4.9 | -2.2 | -1.2 | - | - | - |
| <W2 | Frm | 1.9 | -1.1 | 6.2 | -4.8 | - | - | - |
| WP | Frm | 1.1 | -7.6 | -1.9 | -7.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 2.5 | 7.8 | -2.5 | 8.0 | - | - | - |
| S | Frm | 0.3 | 0.9 | -0.3 | 0.9 | - | - | - |
| E> | Frm | -0.9 | -0.5 | -0.9 | 0.5 | - | - | - |
| EG+ | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| <E | Frm | 0.9 | 0.5 | 0.9 | -0.5 | - | - | - |
| EG- | Frm | -0.0 | -0.1 | 0.0 | -0.1 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B1**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | B1-BB | | B1-BA | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 4.2 | 13.4 | -4.2 | 13.4 | - | - | - |
| 2 | D + CG + <L | 4.2 | 13.4 | -4.2 | 13.4 | - | - | - |
| 3 | D + CG + S> | 2.1 | 6.5 | -2.1 | 6.3 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | 2.1 | 6.5 | -2.1 | 6.3 | - | - | - |
| 5 | D + CG + US1* | 2.2 | 6.3 | -2.2 | 6.6 | - | - | - |
| 6 | D + CG + *US1 | 2.0 | 6.4 | -2.0 | 5.8 | - | - | - |
| 7 | D + CG + W1> | -4.1 | -2.4 | -5.0 | 1.5 | - | - | - |
| 8 | D + CG + <W1 | 4.3 | 1.4 | 3.4 | -2.2 | - | - | - |
| 9 | D + CG + W2> | -4.7 | 0.7 | -4.0 | 4.2 | - | - | - |
| 10 | D + CG + <W2 | 3.7 | 4.5 | 4.4 | 0.6 | - | - | - |
| 11 | D + CG + WP | 2.9 | -2.0 | -3.7 | -1.6 | - | - | - |
| 12 | D + CU + W1> | -5.5 | -6.3 | -3.6 | -2.3 | - | - | - |
| 13 | D + CU + <W1 | 2.9 | -2.5 | 4.8 | -5.9 | - | - | - |
| 14 | D + CU + W2> | -6.1 | -3.2 | -2.6 | 0.5 | - | - | - |
| 15 | D + CU + <W2 | 2.3 | 0.6 | 5.8 | -3.2 | - | - | - |
| 16 | D + CU + WP | 1.5 | -5.9 | -2.3 | -5.4 | - | - | - |
| 17 | D + CG + L + W1> | -0.8 | 5.5 | -6.0 | 8.5 | - | - | - |
| 18 | D + CG + L + <W1 | 5.5 | 8.3 | 0.3 | 5.7 | - | - | - |
| 19 | D + CG + L + W2> | -1.3 | 7.8 | -5.3 | 10.5 | - | - | - |
| 20 | D + CG + L + <W2 | 5.0 | 10.6 | 1.0 | 7.8 | - | - | - |
| 21 | D + CG + L + WP | 4.5 | 5.7 | -5.0 | 6.1 | - | - | - |
| 22 | D + CG + S + W1> | -2.4 | 0.3 | -4.4 | 3.2 | - | - | - |
| 23 | D + CG + S + <W1 | 3.9 | 3.2 | 1.9 | 0.4 | - | - | - |
| 24 | D + CG + S + W2> | -2.9 | 2.6 | -3.7 | 5.2 | - | - | - |
| 25 | D + CG + S + <W2 | 3.4 | 5.5 | 2.7 | 2.5 | - | - | - |
| 26 | D + CG + S + WP | 2.8 | 0.6 | -3.4 | 0.8 | - | - | - |
| 27 | D + CG + E> + EG+ | 1.2 | 5.3 | -2.4 | 5.8 | - | - | - |
| 28 | D + CG + <E + EG+ | 2.4 | 6.0 | -1.2 | 5.1 | - | - | - |
| 29 | D + CU + E> + EG- | -0.2 | 1.2 | -1.0 | 1.9 | - | - | - |
| 30 | D + CU + <E + EG- | 1.0 | 2.0 | 0.3 | 1.2 | - | - | - |
| 31 | D + CG + E> + EG+ | 1.3 | 5.3 | -2.3 | 5.7 | - | - | - |
| 32 | D + CG + <E + EG+ | 2.3 | 5.9 | -1.3 | 5.2 | - | - | - |

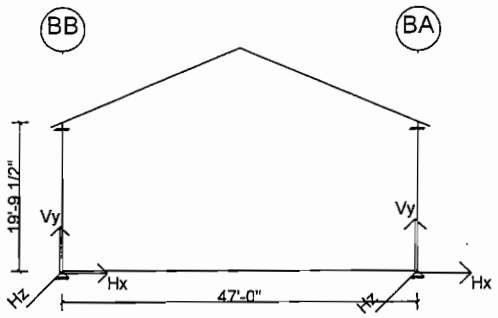
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B1-BB | 6.1 | 14 | 5.5 | 18 | - | - | - | - | 6.3 | 12 | 13.4 | 1 | - | - | - | - |
| 47/0/0 | B1-BA | 6.0 | 17 | 5.8 | 15 | - | - | - | - | 5.9 | 13 | 13.4 | 1 | - | - | - | - |

**Wall: 4, Frame at: 31/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B2**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
| Grid1 - Grid2 | | B2-BB | | B2-BA | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.1 | 4.2 | -1.1 | 4.1 | - | - | - |
| CG | Frm | 2.0 | 4.9 | -2.0 | 4.7 | - | - | - |
| L> | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| <L | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| S> | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| <S | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| US1* | Frm | 0.7 | 1.2 | -0.7 | 2.0 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | 0.6 | - | - | - |
| W1> | Frm | -10.9 | -13.0 | -6.7 | -5.9 | - | - | - |
| <W1 | Frm | 5.4 | -6.2 | 9.5 | -12.6 | - | - | - |
| W2> | Frm | -12.1 | -7.2 | -4.9 | -0.7 | - | - | - |
| <W2 | Frm | 4.2 | -0.4 | 11.3 | -7.5 | - | - | - |
| WP | Frm | 3.3 | -9.8 | -4.5 | -9.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| S | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| E> | Frm | -1.6 | -1.0 | -1.7 | 1.0 | - | - | - |
| EG+ | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| <E | Frm | 1.6 | 1.0 | 1.7 | -1.0 | - | - | - |
| EG- | Frm | -0.1 | -0.2 | 0.1 | -0.2 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B2**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | B2-BB | | B2-BA | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 7.1 | 22.3 | -7.1 | 22.3 | - | - | - |
| 2 | D + CG + <L | 7.1 | 22.3 | -7.1 | 22.3 | - | - | - |
| 3 | D + CG + S> | 3.5 | 10.7 | -3.5 | 10.4 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | 3.5 | 10.7 | -3.5 | 10.4 | - | - | - |
| 5 | D + CG + US1* | 3.7 | 10.4 | -3.7 | 10.8 | - | - | - |
| 6 | D + CG + *US1 | 3.3 | 10.4 | -3.3 | 9.4 | - | - | - |
| 7 | D + CG + W1> | -7.9 | -3.8 | -9.7 | 2.9 | - | - | - |
| 8 | D + CG + <W1 | 8.5 | 2.9 | 6.5 | -3.8 | - | - | - |
| 9 | D + CG + W2> | -9.1 | 1.9 | -7.9 | 8.1 | - | - | - |
| 10 | D + CG + <W2 | 7.2 | 8.7 | 8.3 | 1.3 | - | - | - |
| 11 | D + CG + WP | 6.3 | -0.7 | -7.5 | -0.3 | - | - | - |
| 12 | D + CU + W1> | -10.3 | -10.4 | -7.3 | -3.4 | - | - | - |
| 13 | D + CU + <W1 | 6.1 | -3.7 | 8.9 | -10.1 | - | - | - |
| 14 | D + CU + W2> | -11.5 | -4.7 | -5.5 | 1.8 | - | - | - |
| 15 | D + CU + <W2 | 4.9 | 2.1 | 10.7 | -5.0 | - | - | - |
| 16 | D + CU + WP | 4.0 | -7.3 | -5.2 | -6.7 | - | - | - |
| 17 | D + CG + L + W1> | -2.1 | 9.3 | -11.1 | 14.5 | - | - | - |
| 18 | D + CG + L + <W1 | 10.2 | 14.3 | 1.0 | 9.5 | - | - | - |
| 19 | D + CG + L + W2> | -3.0 | 13.6 | -9.7 | 18.4 | - | - | - |
| 20 | D + CG + L + <W2 | 9.2 | 18.7 | 2.4 | 13.4 | - | - | - |
| 21 | D + CG + L + WP | 8.6 | 11.6 | -9.5 | 12.1 | - | - | - |
| 22 | D + CG + S + W1> | -4.8 | 0.6 | -8.4 | 5.6 | - | - | - |
| 23 | D + CG + S + <W1 | 7.4 | 5.7 | 3.8 | 0.5 | - | - | - |
| 24 | D + CG + S + W2> | -5.7 | 4.9 | -7.0 | 9.5 | - | - | - |
| 25 | D + CG + S + <W2 | 6.5 | 10.0 | 5.1 | 4.4 | - | - | - |
| 26 | D + CG + S + WP | 5.9 | 3.0 | -6.8 | 3.1 | - | - | - |
| 27 | D + CG + E> + EG+ | 1.9 | 8.6 | -4.2 | 9.7 | - | - | - |
| 28 | D + CG + <E + EG+ | 4.2 | 10.0 | -1.9 | 8.2 | - | - | - |
| 29 | D + CU + E> + EG- | -0.6 | 1.6 | -1.8 | 3.1 | - | - | - |
| 30 | D + CU + <E + EG- | 1.7 | 3.1 | 0.6 | 1.6 | - | - | - |
| 31 | D + CG + E> + EG+ | 2.2 | 8.7 | -3.9 | 9.5 | - | - | - |
| 32 | D + CG + <E + EG+ | 3.9 | 9.8 | -2.2 | 8.4 | - | - | - |

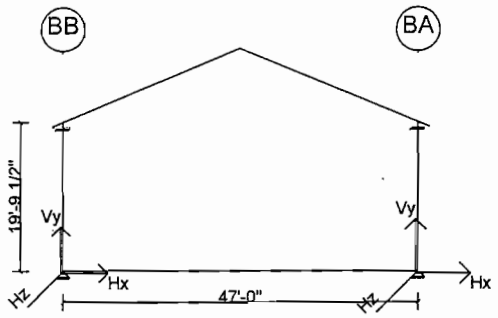
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B2-BB | 11.5 | 14 | 10.2 | 18 | - | - | - | - | 10.4 | 12 | 22.3 | 1 | - | - | - | - |
| 47/0/0 | B2-BA | 11.1 | 17 | 10.7 | 15 | - | - | - | - | 10.1 | 13 | 22.3 | 1 | - | - | - | - |

**Wall: 4, Frame at: 61/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B3**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
| Grid1 - Grid2 | | B3-BB | | B3-BA | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.1 | 4.3 | -1.1 | 4.1 | - | - | - |
| CG | Frm | 1.9 | 4.9 | -1.9 | 4.7 | - | - | - |
| L> | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| <L | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| S> | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| <S | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| US1* | Frm | 0.7 | 1.2 | -0.7 | 2.0 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | 0.6 | - | - | - |
| W1> | Frm | -11.2 | -12.9 | -6.5 | -5.9 | - | - | - |
| <W1 | Frm | 5.6 | -6.2 | 9.3 | -12.6 | - | - | - |
| W2> | Frm | -12.4 | -7.1 | -4.7 | -0.7 | - | - | - |
| <W2 | Frm | 4.4 | -0.4 | 11.1 | -7.5 | - | - | - |
| WP | Frm | 3.4 | -9.5 | -4.5 | -8.9 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| S | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| E> | Frm | -1.7 | -1.0 | -1.6 | 1.0 | - | - | - |
| EG+ | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| <E | Frm | 1.7 | 1.0 | 1.6 | -1.0 | - | - | - |
| EG- | Frm | -0.1 | -0.2 | 0.1 | -0.2 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B3**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | B3-BB | | B3-BA | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 7.1 | 22.3 | -7.1 | 22.3 | - | - | - |
| 2 | D + CG + <L | 7.1 | 22.3 | -7.1 | 22.3 | - | - | - |
| 3 | D + CG + S> | 3.5 | 10.8 | -3.5 | 10.4 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | 3.5 | 10.8 | -3.5 | 10.4 | - | - | - |
| 5 | D + CG + US1* | 3.7 | 10.4 | -3.7 | 10.8 | - | - | - |
| 6 | D + CG + *US1 | 3.3 | 10.5 | -3.3 | 9.4 | - | - | - |
| 7 | D + CG + W1> | -8.2 | -3.7 | -9.5 | 2.9 | - | - | - |
| 8 | D + CG + <W1 | 8.6 | 3.1 | 6.3 | -3.8 | - | - | - |
| 9 | D + CG + W2> | -9.4 | 2.1 | -7.7 | 8.1 | - | - | - |
| 10 | D + CG + <W2 | 7.4 | 8.8 | 8.2 | 1.3 | - | - | - |
| 11 | D + CG + WP | 6.4 | -0.3 | -7.5 | -0.1 | - | - | - |
| 12 | D + CU + W1> | -10.5 | -10.3 | -7.1 | -3.4 | - | - | - |
| 13 | D + CU + <W1 | 6.2 | -3.6 | 8.7 | -10.1 | - | - | - |
| 14 | D + CU + W2> | -11.7 | -4.6 | -5.3 | 1.8 | - | - | - |
| 15 | D + CU + <W2 | 5.0 | 2.2 | 10.5 | -5.0 | - | - | - |
| 16 | D + CU + WP | 4.0 | -6.9 | -5.2 | -6.4 | - | - | - |
| 17 | D + CG + L + W1> | -2.3 | 9.4 | -10.9 | 14.6 | - | - | - |
| 18 | D + CG + L + <W1 | 10.3 | 14.4 | 0.9 | 9.5 | - | - | - |
| 19 | D + CG + L + W2> | -3.2 | 13.7 | -9.6 | 18.4 | - | - | - |
| 20 | D + CG + L + <W2 | 9.4 | 18.8 | 2.3 | 13.4 | - | - | - |
| 21 | D + CG + L + WP | 8.6 | 12.0 | -9.5 | 12.3 | - | - | - |
| 22 | D + CG + S + W1> | -5.0 | 0.7 | -8.2 | 5.6 | - | - | - |
| 23 | D + CG + S + <W1 | 7.5 | 5.8 | 3.7 | 0.5 | - | - | - |
| 24 | D + CG + S + W2> | -5.9 | 5.0 | -6.8 | 9.5 | - | - | - |
| 25 | D + CG + S + <W2 | 6.6 | 10.1 | 5.0 | 4.4 | - | - | - |
| 26 | D + CG + S + WP | 5.9 | 3.3 | -6.8 | 3.4 | - | - | - |
| 27 | D + CG + E> + EG+ | 1.9 | 8.6 | -4.2 | 9.7 | - | - | - |
| 28 | D + CG + <E + EG+ | 4.2 | 10.1 | -1.9 | 8.2 | - | - | - |
| 29 | D + CU + E> + EG- | -0.6 | 1.7 | -1.7 | 3.1 | - | - | - |
| 30 | D + CU + <E + EG- | 1.8 | 3.2 | 0.6 | 1.6 | - | - | - |
| 31 | D + CG + E> + EG+ | 2.1 | 8.8 | -3.9 | 9.5 | - | - | - |
| 32 | D + CG + <E + EG+ | 3.9 | 9.9 | -2.2 | 8.4 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B3-BB | 11.7 | 14 | 10.3 | 18 | - | - | - | - | 10.3 | 12 | 22.3 | 1 | - | - | - | - |
| 47/0/0 | B3-BA | 10.9 | 17 | 10.5 | 15 | - | - | - | - | 10.1 | 13 | 22.3 | 1 | - | - | - | - |

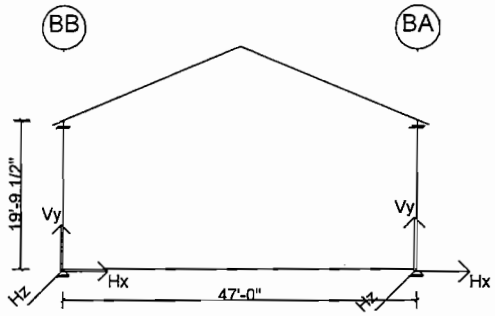
**Wall: 4, Frame at: 91/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Wall: 4, Frame at: 91/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B4**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 47/0/0 | | | | | |
| Grid1 - Grid2 | | B4-BB | | | B4-BA | | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.0 | 0.1 | 6.1 | -1.0 | -0.1 | 5.9 | - | - | - |
| CG | Frm | 1.9 | - | 4.9 | -1.9 | - | 4.7 | - | - | - |
| L> | Frm | 4.1 | - | 13.1 | -4.1 | - | 13.5 | - | - | - |
| <L | Frm | 4.1 | - | 13.1 | -4.1 | - | 13.5 | - | - | - |
| S> | Frm | 0.5 | - | 1.6 | -0.5 | - | 1.6 | - | - | - |
| <S | Frm | 0.5 | - | 1.6 | -0.5 | - | 1.6 | - | - | - |
| US1* | Frm | 0.7 | - | 1.2 | -0.7 | - | 2.0 | - | - | - |
| *US1 | Frm | 0.3 | - | 1.3 | -0.3 | - | 0.6 | - | - | - |
| W1> | Frm | -11.2 | - | -12.9 | -6.5 | - | -5.9 | - | - | - |
| <W1 | Frm | 5.6 | - | -6.2 | 9.3 | - | -12.6 | - | - | - |
| W2> | Frm | -12.4 | - | -7.1 | -4.7 | - | -0.7 | - | - | - |
| <W2 | Frm | 4.4 | - | -0.4 | 11.1 | - | -7.5 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 4.1 | - | 13.1 | -4.1 | - | 13.5 | - | - | - |
| S | Frm | 0.5 | - | 1.6 | -0.5 | - | 1.6 | - | - | - |
| E> | Frm | -1.7 | - | -1.0 | -1.6 | - | 1.0 | - | - | - |
| EG+ | Frm | 0.1 | - | 0.2 | -0.1 | - | 0.2 | - | - | - |
| <E | Frm | 1.7 | - | 1.0 | 1.6 | - | -1.0 | - | - | - |
| EG- | Frm | -0.1 | - | -0.2 | 0.1 | - | -0.2 | - | - | - |
| WP | Frm | 3.4 | - | -9.5 | -4.5 | - | -8.9 | - | - | - |
| WB1> | Brc | 0.1 | -3.9 | -10.6 | -0.1 | 3.9 | -10.6 | - | - | - |
| <WB1 | Brc | -0.1 | 3.9 | 10.6 | 0.1 | -3.9 | 10.6 | - | - | - |
| WB2> | Brc | 0.1 | -3.9 | -10.6 | -0.1 | 3.9 | -10.6 | - | - | - |
| <WB2 | Brc | -0.1 | 3.9 | 10.6 | 0.1 | -3.9 | 10.6 | - | - | - |
| EB> | Brc | 0.0 | -1.7 | -4.8 | -0.0 | 1.7 | -4.8 | - | - | - |
| <EB | Brc | -0.0 | 1.8 | 4.8 | 0.0 | -1.8 | 4.8 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B4**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | 47/0/0 | | | |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | B4-BB | | | B4-BA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 7.1 | 0.1 | 24.1 | -7.1 | -0.1 | 24.1 | - | - | - |
| 2 | D + CG + <L | 7.1 | 0.1 | 24.1 | -7.1 | -0.1 | 24.1 | - | - | - |
| 3 | D + CG + S> | 3.4 | 0.1 | 12.6 | -3.4 | -0.1 | 12.2 | - | - | - |
| 4 | D + CG + <S | 3.4 | 0.1 | 12.6 | -3.4 | -0.1 | 12.2 | - | - | - |
| 5 | D + CG + US1* | 3.7 | 0.1 | 12.2 | -3.7 | -0.1 | 12.6 | - | - | - |
| 6 | D + CG + *US1 | 3.2 | 0.1 | 12.3 | -3.2 | -0.1 | 11.2 | - | - | - |
| 7 | D + CG + W1> | -8.2 | 0.1 | -1.9 | -9.5 | -0.1 | 4.7 | - | - | - |
| 8 | D + CG + <W1 | 8.6 | 0.1 | 4.8 | 6.4 | -0.1 | -2.0 | - | - | - |
| 9 | D + CG + W2> | -9.4 | 0.1 | 3.9 | -7.6 | -0.1 | 9.9 | - | - | - |
| 10 | D + CG + <W2 | 7.4 | 0.1 | 10.6 | 8.2 | -0.1 | 3.1 | - | - | - |
| 11 | D + CU + W1> | -10.5 | 0.1 | -9.2 | -7.1 | -0.1 | -2.3 | - | - | - |
| 12 | D + CU + <W1 | 6.2 | 0.1 | -2.5 | 8.7 | -0.1 | -9.1 | - | - | - |
| 13 | D + CU + W2> | -11.7 | 0.1 | -3.5 | -5.3 | -0.1 | 2.8 | - | - | - |
| 14 | D + CU + <W2 | 5.0 | 0.1 | 3.2 | 10.5 | -0.1 | -3.9 | - | - | - |
| 15 | D + CG + L + W1> | -2.3 | 0.1 | 11.2 | -10.9 | -0.1 | 16.3 | - | - | - |
| 16 | D + CG + L + <W1 | 10.2 | 0.1 | 16.2 | 0.9 | -0.1 | 11.3 | - | - | - |
| 17 | D + CG + L + W2> | -3.2 | 0.1 | 15.5 | -9.6 | -0.1 | 20.2 | - | - | - |
| 18 | D + CG + L + <W2 | 9.3 | 0.1 | 20.5 | 2.3 | -0.1 | 15.2 | - | - | - |
| 19 | D + CG + S + W1> | -5.1 | 0.1 | 2.5 | -8.2 | -0.1 | 7.4 | - | - | - |
| 20 | D + CG + S + <W1 | 7.5 | 0.1 | 7.5 | 3.7 | -0.1 | 2.3 | - | - | - |
| 21 | D + CG + S + W2> | -6.0 | 0.1 | 6.8 | -6.8 | -0.1 | 11.3 | - | - | - |
| 22 | D + CG + S + <W2 | 6.6 | 0.1 | 11.9 | 5.0 | -0.1 | 6.2 | - | - | - |
| 23 | D + CG + E> + EG+ | 1.8 | 0.1 | 10.4 | -4.2 | -0.1 | 11.5 | - | - | - |
| 24 | D + CG + <E + EG+ | 4.2 | 0.1 | 11.9 | -1.9 | -0.1 | 10.0 | - | - | - |
| 25 | D + CU + E> + EG- | -0.6 | 0.1 | 2.8 | -1.7 | -0.1 | 4.1 | - | - | - |
| 26 | D + CU + <E + EG- | 1.8 | 0.1 | 4.2 | 0.6 | -0.1 | 2.7 | - | - | - |
| 27 | D + CG + E> + EG+ | 2.1 | 0.1 | 10.6 | -3.9 | -0.1 | 11.2 | - | - | - |
| 28 | D + CG + <E + EG+ | 3.9 | 0.1 | 11.7 | -2.2 | -0.1 | 10.1 | - | - | - |
| 29 | D + CG + WP + WB1> | 6.4 | -3.8 | -9.0 | -7.6 | 3.8 | -8.8 | - | - | - |
| 30 | D + CU + WP + WB1> | 4.1 | -3.9 | -16.4 | -5.3 | 3.9 | -15.9 | - | - | - |
| 31 | D + CG + L + WP + WB1> | 8.6 | -2.8 | 5.8 | -9.5 | 2.8 | 6.2 | - | - | - |
| 32 | D + CG + S + WP + WB1> | 5.9 | -2.8 | -2.9 | -6.8 | 2.8 | -2.8 | - | - | - |
| 33 | D + CG + WP + <WB1 | 6.2 | 4.0 | 12.1 | -7.4 | -4.0 | 12.3 | - | - | - |
| 34 | D + CU + WP + <WB1 | 3.9 | 4.0 | 4.7 | -5.1 | -4.0 | 5.3 | - | - | - |
| 35 | D + CG + L + WP + <WB1 | 8.5 | 3.0 | 21.7 | -9.4 | -3.0 | 22.0 | - | - | - |
| 36 | D + CG + S + WP + <WB1 | 5.8 | 3.0 | 13.0 | -6.7 | -3.0 | 13.1 | - | - | - |
| 37 | D + CG + WP + WB2> | 6.4 | -3.8 | -9.0 | -7.6 | 3.8 | -8.8 | - | - | - |
| 38 | D + CU + WP + WB2> | 4.1 | -3.9 | -16.4 | -5.3 | 3.9 | -15.9 | - | - | - |
| 39 | D + CG + L + WP + WB2> | 8.6 | -2.8 | 5.8 | -9.5 | 2.8 | 6.2 | - | - | - |
| 40 | D + CG + S + WP + WB2> | 5.9 | -2.8 | -2.9 | -6.8 | 2.8 | -2.8 | - | - | - |
| 41 | D + CG + WP + <WB2 | 6.2 | 4.0 | 12.1 | -7.4 | -4.0 | 12.3 | - | - | - |
| 42 | D + CU + WP + <WB2 | 3.9 | 4.0 | 4.7 | -5.1 | -4.0 | 5.3 | - | - | - |
| 43 | D + CG + L + WP + <WB2 | 8.5 | 3.0 | 21.7 | -9.4 | -3.0 | 22.0 | - | - | - |
| 44 | D + CG + S + WP + <WB2 | 5.8 | 3.0 | 13.0 | -6.7 | -3.0 | 13.1 | - | - | - |
| 45 | D + CG + EB> + EG+ | 3.1 | -1.1 | 7.8 | -3.1 | 1.1 | 7.4 | - | - | - |
| 46 | D + CU + EB> + EG- | 0.6 | -1.2 | 0.1 | -0.6 | 1.1 | 0.1 | - | - | - |
| 47 | D + CG + EB> + EG+ | 3.0 | -0.8 | 8.6 | -3.0 | 0.8 | 8.2 | - | - | - |
| 48 | D + CG + <EB + EG+ | 3.0 | 1.4 | 14.5 | -3.0 | -1.4 | 14.1 | - | - | - |
| 49 | D + CU + <EB + EG- | 0.5 | 1.3 | 6.9 | -0.5 | -1.3 | 6.8 | - | - | - |
| 50 | D + CG + <EB + EG+ | 3.0 | 1.0 | 13.6 | -3.0 | -1.0 | 13.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B4-BB | 11.7 | 13 | 10.2 | 16 | 3.9 | 30 | 4.0 | 41 | 16.4 | 38 | 24.1 | 1 | - | - | - | - |
| 47/0/0 | B4-BA | 10.9 | 15 | 10.5 | 14 | 4.0 | 41 | 3.9 | 30 | 15.9 | 30 | 24.1 | 1 | - | - | - | - |

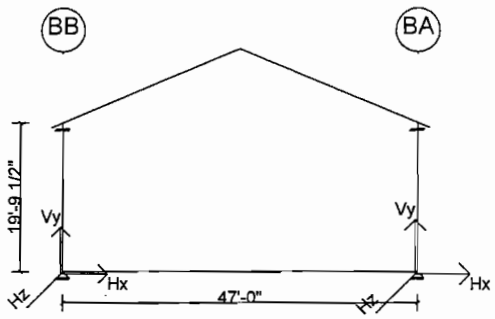
**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | BB-B4 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

| | | |
|---|---|---|
| 47/0/0 | BA-B4 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

**Wall: 4, Frame at: 121/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B5**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 47/0/0 | | | | | |
| Grid1 - Grid2 | | B5-BB | | | B5-BA | | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.0 | -0.1 | 6.0 | -1.0 | 0.1 | 5.9 | - | - | - |
| CG | Frm | 1.9 | - | 4.9 | -1.9 | - | 4.7 | - | - | - |
| L> | Frm | 4.1 | - | 13.1 | -4.1 | - | 13.5 | - | - | - |
| <L | Frm | 4.1 | - | 13.1 | -4.1 | - | 13.5 | - | - | - |
| S> | Frm | 0.5 | - | 1.6 | -0.5 | - | 1.6 | - | - | - |
| <S | Frm | 0.5 | - | 1.6 | -0.5 | - | 1.6 | - | - | - |
| US1* | Frm | 0.7 | - | 1.2 | -0.7 | - | 2.0 | - | - | - |
| *US1 | Frm | 0.3 | - | 1.3 | -0.3 | - | 0.6 | - | - | - |
| W1> | Frm | -11.2 | - | -12.9 | -6.5 | - | -5.9 | - | - | - |
| <W1 | Frm | 5.6 | - | -6.2 | 9.3 | - | -12.6 | - | - | - |
| W2> | Frm | -12.3 | - | -7.1 | -4.7 | - | -0.7 | - | - | - |
| <W2 | Frm | 4.4 | - | -0.4 | 11.1 | - | -7.5 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 4.1 | - | 13.1 | -4.1 | - | 13.5 | - | - | - |
| S | Frm | 0.5 | - | 1.6 | -0.5 | - | 1.6 | - | - | - |
| E> | Frm | -1.7 | - | -1.0 | -1.7 | - | 1.0 | - | - | - |
| EG+ | Frm | 0.1 | - | 0.2 | -0.1 | - | 0.2 | - | - | - |
| <E | Frm | 1.7 | - | 1.0 | 1.7 | - | -1.0 | - | - | - |
| EG- | Frm | -0.1 | - | -0.2 | 0.1 | - | -0.2 | - | - | - |
| WP | Frm | 3.3 | - | -9.5 | -4.5 | - | -8.9 | - | - | - |
| WB1> | Brc | -0.1 | -3.9 | 10.6 | 0.1 | 3.9 | 10.6 | - | - | - |
| <WB1 | Brc | 0.1 | 3.9 | -10.6 | -0.1 | -3.9 | -10.6 | - | - | - |
| WB2> | Brc | -0.1 | -3.9 | 10.6 | 0.1 | 3.9 | 10.6 | - | - | - |
| <WB2 | Brc | 0.1 | 3.9 | -10.6 | -0.1 | -3.9 | -10.6 | - | - | - |
| EB> | Brc | -0.1 | -1.8 | 4.8 | 0.1 | 1.8 | 4.8 | - | - | - |
| <EB | Brc | 0.1 | 1.7 | -4.8 | -0.1 | -1.7 | -4.8 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B5**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | 0/0/0 | 47/0/0 | | | |
|---|---|---|---|---|---|

| Grid1 - Grid2 | | B5-BB | | | B5-BA | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ld | Description | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 7.0 | -0.1 | 24.1 | -7.0 | 0.1 | 24.1 | - | - | - |
| 2 | D + CG + <L | 7.0 | -0.1 | 24.1 | -7.0 | 0.1 | 24.1 | - | - | - |
| 3 | D + CG + S> | 3.4 | -0.1 | 12.5 | -3.4 | 0.1 | 12.2 | - | - | - |
| 4 | D + CG + <S | 3.4 | -0.1 | 12.5 | -3.4 | 0.1 | 12.2 | - | - | - |
| 5 | D + CG + US1* | 3.6 | -0.1 | 12.2 | -3.6 | 0.1 | 12.6 | - | - | - |
| 6 | D + CG + *US1 | 3.2 | -0.1 | 12.2 | -3.2 | 0.1 | 11.2 | - | - | - |
| 7 | D + CG + W1> | -8.2 | -0.1 | -1.9 | -9.5 | 0.1 | 4.7 | - | - | - |
| 8 | D + CG + <W1 | 8.5 | -0.1 | 4.8 | 6.4 | 0.1 | -2.0 | - | - | - |
| 9 | D + CG + W2> | -9.4 | -0.1 | 3.8 | -7.7 | 0.1 | 9.9 | - | - | - |
| 10 | D + CG + <W2 | 7.3 | -0.1 | 10.6 | 8.2 | 0.1 | 3.1 | - | - | - |
| 11 | D + CU + W1> | -10.5 | -0.1 | -9.3 | -7.1 | 0.1 | -2.3 | - | - | - |
| 12 | D + CU + <W1 | 6.2 | -0.1 | -2.5 | 8.7 | 0.1 | -9.1 | - | - | - |
| 13 | D + CU + W2> | -11.7 | -0.1 | -3.5 | -5.3 | 0.1 | 2.8 | - | - | - |
| 14 | D + CU + <W2 | 5.0 | -0.1 | 3.2 | 10.5 | 0.1 | -3.9 | - | - | - |
| 15 | D + CG + L + W1> | -2.4 | -0.1 | 11.1 | -10.9 | 0.1 | 16.3 | - | - | - |
| 16 | D + CG + L + <W1 | 10.2 | -0.1 | 16.2 | 1.0 | 0.1 | 11.3 | - | - | - |
| 17 | D + CG + L + W2> | -3.2 | -0.1 | 15.5 | -9.5 | 0.1 | 20.2 | - | - | - |
| 18 | D + CG + L + <W2 | 9.3 | -0.1 | 20.5 | 2.4 | 0.1 | 15.2 | - | - | - |
| 19 | D + CG + S + W1> | -5.1 | -0.1 | 2.5 | -8.2 | 0.1 | 7.4 | - | - | - |
| 20 | D + CG + S + <W1 | 7.5 | -0.1 | 7.5 | 3.7 | 0.1 | 2.3 | - | - | - |
| 21 | D + CG + S + W2> | -6.0 | -0.1 | 6.8 | -6.8 | 0.1 | 11.3 | - | - | - |
| 22 | D + CG + S + <W2 | 6.6 | -0.1 | 11.8 | 5.1 | 0.1 | 6.2 | - | - | - |
| 23 | D + CG + E> + EG+ | 1.8 | -0.1 | 10.4 | -4.2 | 0.1 | 11.5 | - | - | - |
| 24 | D + CG + <E + EG+ | 4.2 | -0.1 | 11.8 | -1.8 | 0.1 | 10.0 | - | - | - |
| 25 | D + CU + E> + EG- | -0.6 | -0.1 | 2.7 | -1.7 | 0.1 | 4.1 | - | - | - |
| 26 | D + CU + <E + EG- | 1.7 | -0.1 | 4.2 | 0.6 | 0.1 | 2.7 | - | - | - |
| 27 | D + CG + E> + EG+ | 2.1 | -0.1 | 10.5 | -3.9 | 0.1 | 11.2 | - | - | - |
| 28 | D + CG + <E + EG+ | 3.9 | -0.1 | 11.6 | -2.1 | 0.1 | 10.1 | - | - | - |
| 29 | D + CG + WP + WB1> | 6.2 | -4.0 | 12.0 | -7.3 | 4.0 | 12.3 | - | - | - |
| 30 | D + CU + WP + WB1> | 3.8 | -4.0 | 4.7 | -5.0 | 4.0 | 5.3 | - | - | - |
| 31 | D + CG + L + WP + WB1> | 8.4 | -3.0 | 21.6 | -9.3 | 3.0 | 22.0 | - | - | - |
| 32 | D + CG + S + WP + WB1> | 5.7 | -3.0 | 12.9 | -6.6 | 3.0 | 13.1 | - | - | - |
| 33 | D + CG + WP + <WB1 | 6.4 | 3.8 | -9.1 | -7.6 | -3.8 | -8.8 | - | - | - |
| 34 | D + CU + WP + <WB1 | 4.1 | 3.9 | -16.4 | -5.3 | -3.9 | -15.9 | - | - | - |
| 35 | D + CG + L + WP + <WB1 | 8.6 | 2.8 | 5.8 | -9.5 | -2.8 | 6.2 | - | - | - |
| 36 | D + CG + S + WP + <WB1 | 5.9 | 2.8 | -2.9 | -6.8 | -2.8 | -2.8 | - | - | - |
| 37 | D + CG + WP + WB2> | 6.2 | -4.0 | 12.0 | -7.3 | 4.0 | 12.3 | - | - | - |
| 38 | D + CU + WP + WB2> | 3.8 | -4.0 | 4.7 | -5.0 | 4.0 | 5.3 | - | - | - |
| 39 | D + CG + L + WP + WB2> | 8.4 | -3.0 | 21.6 | -9.3 | 3.0 | 22.0 | - | - | - |
| 40 | D + CG + S + WP + WB2> | 5.7 | -3.0 | 12.9 | -6.6 | 3.0 | 13.1 | - | - | - |
| 41 | D + CG + WP + <WB2 | 6.4 | 3.8 | -9.1 | -7.6 | -3.8 | -8.8 | - | - | - |
| 42 | D + CU + WP + <WB2 | 4.1 | 3.9 | -16.4 | -5.3 | -3.9 | -15.9 | - | - | - |
| 43 | D + CG + L + WP + <WB2 | 8.6 | 2.8 | 5.8 | -9.5 | -2.8 | 6.2 | - | - | - |
| 44 | D + CG + S + WP + <WB2 | 5.9 | 2.8 | -2.9 | -6.8 | -2.8 | -2.8 | - | - | - |
| 45 | D + CG + EB> + EG+ | 3.0 | -1.4 | 14.5 | -3.0 | 1.4 | 14.1 | - | - | - |
| 46 | D + CU + EB> + EG- | 0.5 | -1.3 | 6.8 | -0.5 | 1.3 | 6.8 | - | - | - |
| 47 | D + CG + EB> + EG+ | 3.0 | -1.0 | 13.6 | -3.0 | 1.0 | 13.2 | - | - | - |
| 48 | D + CG + <EB + EG+ | 3.0 | 1.1 | 7.7 | -3.0 | -1.1 | 7.4 | - | - | - |
| 49 | D + CU + <EB + EG- | 0.6 | 1.2 | 0.1 | -0.6 | -1.1 | 0.1 | - | - | - |
| 50 | D + CG + <EB + EG+ | 3.0 | 0.8 | 8.5 | -3.0 | -0.8 | 8.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B5-BB | 11.7 | 13 | 10.2 | 16 | 4.0 | 37 | 3.9 | 34 | 16.4 | 34 | 24.1 | 1 | - | - | - | - |
| 47/0/0 | B5-BA | 10.9 | 15 | 10.5 | 14 | 3.9 | 34 | 4.0 | 37 | 15.9 | 42 | 24.1 | 1 | - | - | - | - |

**Bracing**

| X-Loc | Grid | Description |
|---|---|---|
| 0/0/0 | BB-B5 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

| | | |
|---|---|---|
| 47/0/0 | BA-B5 | Flush Portal Frame is attached to the column so reactions are included with the above frame reactions |

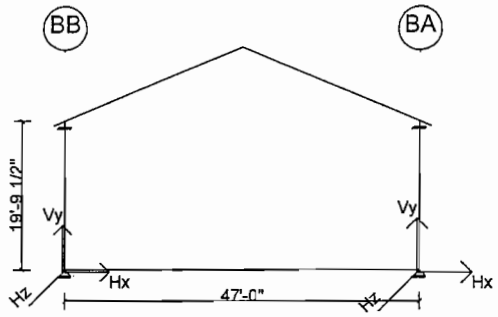
**Wall: 4, Frame at: 151/0/0**

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 29 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 31 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Wall: 4, Frame at: 151/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B6**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
| Grid1 - Grid2 | | B6-BB | | B6-BA | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.1 | 4.2 | -1.1 | 4.1 | - | - | - |
| CG | Frm | 2.0 | 4.9 | -2.0 | 4.7 | - | - | - |
| L> | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| <L | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| S> | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| <S | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| US1* | Frm | 0.7 | 1.2 | -0.7 | 2.0 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | 0.6 | - | - | - |
| W1> | Frm | -10.9 | -13.0 | -6.7 | -5.9 | - | - | - |
| <W1 | Frm | 5.4 | -6.2 | 9.5 | -12.6 | - | - | - |
| W2> | Frm | -12.1 | -7.2 | -4.9 | -0.7 | - | - | - |
| <W2 | Frm | 4.2 | -0.4 | 11.3 | -7.5 | - | - | - |
| WP | Frm | 3.3 | -9.8 | -4.5 | -9.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 4.1 | 13.1 | -4.1 | 13.5 | - | - | - |
| S | Frm | 0.5 | 1.6 | -0.5 | 1.6 | - | - | - |
| E> | Frm | -1.6 | -1.0 | -1.7 | 1.0 | - | - | - |
| EG+ | Frm | 0.1 | 0.2 | -0.1 | 0.2 | - | - | - |
| <E | Frm | 1.6 | 1.0 | 1.7 | -1.0 | - | - | - |
| EG- | Frm | -0.1 | -0.2 | 0.1 | -0.2 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B6**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | B6-BB | | B6-BA | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 7.1 | 22.3 | -7.1 | 22.3 | - | - | - |
| 2 | D + CG + <L | 7.1 | 22.3 | -7.1 | 22.3 | - | - | - |
| 3 | D + CG + S> | 3.5 | 10.7 | -3.5 | 10.4 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | 3.5 | 10.7 | -3.5 | 10.4 | - | - | - |
| 5 | D + CG + US1* | 3.7 | 10.4 | -3.7 | 10.8 | - | - | - |
| 6 | D + CG + *US1 | 3.3 | 10.4 | -3.3 | 9.4 | - | - | - |
| 7 | D + CG + W1> | -7.9 | -3.8 | -9.7 | 2.9 | - | - | - |
| 8 | D + CG + <W1 | 8.5 | 2.9 | 6.5 | -3.8 | - | - | - |
| 9 | D + CG + W2> | -9.1 | 1.9 | -7.9 | 8.1 | - | - | - |
| 10 | D + CG + <W2 | 7.2 | 8.7 | 8.3 | 1.3 | - | - | - |
| 11 | D + CG + WP | 6.3 | -0.7 | -7.5 | -0.3 | - | - | - |
| 12 | D + CU + W1> | -10.3 | -10.4 | -7.3 | -3.4 | - | - | - |
| 13 | D + CU + <W1 | 6.1 | -3.7 | 8.9 | -10.1 | - | - | - |
| 14 | D + CU + W2> | -11.5 | -4.7 | -5.5 | 1.8 | - | - | - |
| 15 | D + CU + <W2 | 4.9 | 2.1 | 10.7 | -5.0 | - | - | - |
| 16 | D + CU + WP | 4.0 | -7.3 | -5.2 | -6.7 | - | - | - |
| 17 | D + CG + L + W1> | -2.1 | 9.3 | -11.1 | 14.5 | - | - | - |
| 18 | D + CG + L + <W1 | 10.2 | 14.3 | 1.0 | 9.5 | - | - | - |
| 19 | D + CG + L + W2> | -3.0 | 13.6 | -9.7 | 18.4 | - | - | - |
| 20 | D + CG + L + <W2 | 9.2 | 18.7 | 2.4 | 13.4 | - | - | - |
| 21 | D + CG + L + WP | 8.6 | 11.6 | -9.5 | 12.1 | - | - | - |
| 22 | D + CG + S + W1> | -4.8 | 0.6 | -8.4 | 5.6 | - | - | - |
| 23 | D + CG + S + <W1 | 7.4 | 5.7 | 3.8 | 0.5 | - | - | - |
| 24 | D + CG + S + W2> | -5.7 | 4.9 | -7.0 | 9.5 | - | - | - |
| 25 | D + CG + S + <W2 | 6.5 | 10.0 | 5.1 | 4.4 | - | - | - |
| 26 | D + CG + S + WP | 5.9 | 3.0 | -6.8 | 3.1 | - | - | - |
| 27 | D + CG + E> + EG+ | 1.9 | 8.6 | -4.2 | 9.7 | - | - | - |
| 28 | D + CG + <E + EG+ | 4.2 | 10.0 | -1.9 | 8.2 | - | - | - |
| 29 | D + CU + E> + EG- | -0.6 | 1.6 | -1.8 | 3.1 | - | - | - |
| 30 | D + CU + <E + EG- | 1.7 | 3.1 | 0.6 | 1.6 | - | - | - |
| 31 | D + CG + E> + EG+ | 2.2 | 8.7 | -3.9 | 9.5 | - | - | - |
| 32 | D + CG + <E + EG+ | 3.9 | 9.8 | -2.2 | 8.4 | - | - | - |

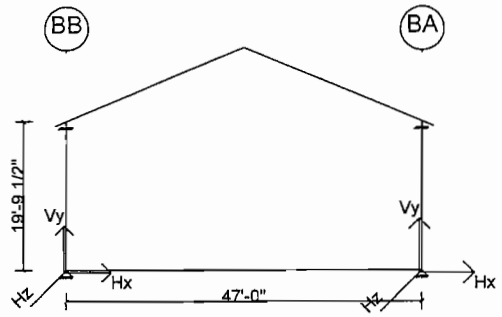
**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B6-BB | 11.5 | 14 | 10.2 | 18 | - | - | - | - | 10.4 | 12 | 22.3 | 1 | - | - | - | - |
| 47/0/0 | B6-BA | 11.1 | 17 | 10.7 | 15 | - | - | - | - | 10.1 | 13 | 22.3 | 1 | - | - | - | - |

**Wall: 4, Frame at: 181/0/0**
Frame ID:Rigid Frame

Frame Type:Rigid Frame




Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: B7**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
| Grid1 - Grid2 | | B7-BB | | B7-BA | | | | |
| Base Plate W x L (in.) | | 8 x 13 | | 8 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.7 | 2.7 | -0.7 | 2.7 | - | - | - |
| CG | Frm | 1.1 | 2.8 | -1.1 | 2.7 | - | - | - |
| L> | Frm | 2.5 | 7.8 | -2.5 | 8.0 | - | - | - |
| <L | Frm | 2.5 | 7.8 | -2.5 | 8.0 | - | - | - |
| S> | Frm | 0.3 | 0.9 | -0.3 | 0.9 | - | - | - |
| <S | Frm | 0.3 | 0.9 | -0.3 | 0.9 | - | - | - |
| US1* | Frm | 0.4 | 0.7 | -0.4 | 1.2 | - | - | - |
| *US1 | Frm | 0.2 | 0.8 | -0.2 | 0.4 | - | - | - |
| W1> | Frm | -5.9 | -8.0 | -3.2 | -3.9 | - | - | - |
| <W1 | Frm | 2.6 | -4.2 | 5.2 | -7.6 | - | - | - |
| W2> | Frm | -6.5 | -4.9 | -2.2 | -1.2 | - | - | - |
| <W2 | Frm | 1.9 | -1.1 | 6.2 | -4.8 | - | - | - |
| WP | Frm | 1.1 | -7.6 | -1.9 | -7.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 2.5 | 7.8 | -2.5 | 8.0 | - | - | - |
| S | Frm | 0.3 | 0.9 | -0.3 | 0.9 | - | - | - |
| E> | Frm | -0.9 | -0.6 | -0.9 | 0.6 | - | - | - |
| EG+ | Frm | 0.0 | 0.1 | -0.0 | 0.1 | - | - | - |
| <E | Frm | 0.9 | 0.6 | 0.9 | -0.6 | - | - | - |
| EG- | Frm | -0.0 | -0.1 | 0.0 | -0.1 | - | - | - |

**Frame Reactions - Factored Load Cases at Frame Cross Section: B7**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | | 0/0/0 | | 47/0/0 | | | | |
|---|---|---|---|---|---|---|---|---|
| Grid1 - Grid2 | | B7-BB | | B7-BA | | | | |
| Ld | Description | Hx | Vy | Hx | Vy | | | |
| Cs | (application factor not shown) | (k) | (k) | (k) | (k) | | | |
| 1 | D + CG + L> | 4.2 | 13.3 | -4.2 | 13.4 | - | - | - |
| 2 | D + CG + <L | 4.2 | 13.3 | -4.2 | 13.4 | - | - | - |
| 3 | D + CG + S> | 2.1 | 6.4 | -2.1 | 6.3 | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | D + CG + <S | 2.1 | 6.4 | -2.1 | 6.3 | - | - | - |
| 5 | D + CG + US1* | 2.2 | 6.2 | -2.2 | 6.6 | - | - | - |
| 6 | D + CG + *US1 | 1.9 | 6.3 | -1.9 | 5.8 | - | - | - |
| 7 | D + CG + W1> | -4.1 | -2.5 | -4.9 | 1.5 | - | - | - |
| 8 | D + CG + <W1 | 4.4 | 1.3 | 3.4 | -2.2 | - | - | - |
| 9 | D + CG + W2> | -4.7 | 0.6 | -4.0 | 4.2 | - | - | - |
| 10 | D + CG + <W2 | 3.7 | 4.4 | 4.4 | 0.6 | - | - | - |
| 11 | D + CG + WP | 2.9 | -2.1 | -3.7 | -1.6 | - | - | - |
| 12 | D + CU + W1> | -5.5 | -6.4 | -3.6 | -2.3 | - | - | - |
| 13 | D + CU + <W1 | 3.0 | -2.6 | 4.8 | -6.0 | - | - | - |
| 14 | D + CU + W2> | -6.1 | -3.3 | -2.6 | 0.4 | - | - | - |
| 15 | D + CU + <W2 | 2.3 | 0.5 | 5.8 | -3.2 | - | - | - |
| 16 | D + CU + WP | 1.5 | -6.0 | -2.3 | -5.4 | - | - | - |
| 17 | D + CG + L + W1> | -0.8 | 5.3 | -6.0 | 8.5 | - | - | - |
| 18 | D + CG + L + <W1 | 5.6 | 8.2 | 0.3 | 5.7 | - | - | - |
| 19 | D + CG + L + W2> | -1.3 | 7.6 | -5.3 | 10.5 | - | - | - |
| 20 | D + CG + L + <W2 | 5.1 | 10.5 | 1.0 | 7.8 | - | - | - |
| 21 | D + CG + L + WP | 4.5 | 5.6 | -5.0 | 6.1 | - | - | - |
| 22 | D + CG + S + W1> | -2.4 | 0.2 | -4.4 | 3.1 | - | - | - |
| 23 | D + CG + S + <W1 | 3.9 | 3.1 | 1.9 | 0.4 | - | - | - |
| 24 | D + CG + S + W2> | -2.9 | 2.5 | -3.6 | 5.2 | - | - | - |
| 25 | D + CG + S + <W2 | 3.4 | 5.4 | 2.7 | 2.5 | - | - | - |
| 26 | D + CG + S + WP | 2.8 | 0.5 | -3.4 | 0.8 | - | - | - |
| 27 | D + CG + E> + EG+ | 1.2 | 5.2 | -2.4 | 5.9 | - | - | - |
| 28 | D + CG + <E + EG+ | 2.4 | 6.0 | -1.2 | 5.1 | - | - | - |
| 29 | D + CU + E> + EG- | -0.3 | 1.1 | -1.0 | 1.9 | - | - | - |
| 30 | D + CU + <E + EG- | 1.0 | 1.9 | 0.3 | 1.1 | - | - | - |
| 31 | D + CG + E> + EG+ | 1.3 | 5.3 | -2.3 | 5.7 | - | - | - |
| 32 | D + CG + <E + EG+ | 2.3 | 5.9 | -1.3 | 5.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B7-BB | 6.1 | 14 | 5.6 | 18 | - | - | - | - | 6.4 | 12 | 13.3 | 1 | - | - | - | - |
| 47/0/0 | B7-BA | 6.0 | 17 | 5.8 | 15 | - | - | - | - | 6.0 | 13 | 13.4 | 1 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 29 | D + CG + E> + EG+ | - | 1.5 | -0.1 | 1.3 | - | - | - |
| 30 | D + CG + <E + EG+ | - | 1.5 | 0.1 | 1.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | B1- | 0.2 | 7 | 0.2 | 9 | - | - | - | - | 3.1 | 10 | 4.8 | 1 | - | - | - | - |
| 10/0/0 | 0/0/1 | 2.7 | 5 | 0.2 | 9 | - | - | - | - | 2.0 | 14 | 4.0 | 1 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 29 | D + CG + E> + EG+ | - | 1.5 | -0.1 | 1.3 | - | - | - |
| 30 | D + CG + <E + EG+ | - | 1.5 | 0.1 | 1.2 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | - | 0.2 | 7 | 0.2 | 9 | - | - | - | - | 3.1 | 10 | 4.8 | 1 | - | - | - | - |
| 10/0/0 | 0/0/1 | 2.7 | 5 | 0.3 | 9 | - | - | - | - | 2.0 | 14 | 4.0 | 1 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 38 | D + CG + S + WP + WB2> | 0.1 | - | 0.1 | 0.2 | -0.2 | - | - | - |
| 39 | D + CG + WP + <WB2 | 0.2 | - | -0.8 | 0.3 | -1.0 | - | - | - |

## Underwriters Laboratory UL-90 Letter

Contact:
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

The goods listed herein are purchased subject to the VP BUILDINGS terms and conditions of sale and the limitations contained therein.

**Roof Covering**

| Shape | Location | Type | Thickness | Spacing |
|---|---|---|---|---|
| Operations Building | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Operations Building | Wall: 4,Canopy: 4 | SLR2 | 22 | UL90 Uplift |
| Operations Building | Roof: A | SLR2 | 22 | UL90 Uplift |
| Operations Building | Roof: B | SLR2 | 22 | UL90 Uplift |
| Operations Building Lean-to | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Operations Building Lean-to | Roof: A | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Wall: 4,Canopy: 4 | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Roof: A | SLR2 | 22 | UL90 Uplift |
| Maintenance Area | Roof: B | SLR2 | 22 | UL90 Uplift |
| Boat Storage Building | Wall: 2,Canopy: 2 | SLR2 | 22 | UL90 Uplift |
| Boat Storage Building | Wall: 4,Canopy: 4 | SLR2 | 22 | UL90 Uplift |
| Boat Storage Building | Roof: A | SLR2 | 22 | UL90 Uplift |
| Boat Storage Building | Roof: B | SLR2 | 22 | UL90 Uplift |

**SLR2 Roof UL-90 Certification**

This is to certify that the VP Buildings SLR SYSTEM, when installed in accordance with VP Buildings Basic Erection Guide and Standard Erection Details (SEDs), will meet Underwriters Laboratories UL Class 90 Uplift Rating. The SLR system has been tested and is listed under Underwriters Laboratories Construction No. 90.

VP BUILDINGS Inc.
3200 Players Club Circle Memphis TN 38125-8843

By: _____

STEPHEN L. CARR
REGISTERED PROFESSIONAL
PE. 11895
ENGINEER
STATE OF MISSISSIPPI

# VP Buildings

3200 Players Club Circle
Memphis, TN 38125-8843

# STRUCTURAL DESIGN DATA

Project: Riverine and Combatant Craft Operations Facility
Name: 08-28914 EP3
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County: Hancock
Country: United States

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CHANGES FOLLOW ON PAGES D1-D10 →





## Letter of Certification

Contact: Craig Seals
Name: Broadmoor, LLC
Address: 2740 N. Arnoult Road

City, State: Metairie, Louisiana 70002
Country: United States

Project: Riverine and Combatant Craft Operations Facility
Builder PO #:
Jobsite:

City, State: Stennis Space Center, Mississippi 39529
County, Country: Hancock, United States

This is to certify that the above referenced VP BUILDINGS project has been designed for the applicable portions of the following Building Code and in accordance with the order documents which have stipulated the following applied environmental loads and conditions:

**Overall Building Description**

| Shape | Overall Width | Overall Length | Floor Area (sq. ft.) | Wall Area (sq. ft.) | Roof Area (sq. ft.) | Max. Eave Height | Min. Eave Height 2 | Max. Roof Pitch | Min. Roof Pitch | Peak Height |
|---|---|---|---|---|---|---|---|---|---|---|
| Boat Storage Building | 47/0/0 | 182/0/0 | 8554 | 10574 | 9719 | 22/1/0 | 22/1/0 | 5.000:12 | 5.000:12 | 31/10/8 |
| Clerestory A | 10/4/1 | 182/0/0 | 1882 | 2485 | 2058 | 8/7/6 | 4/3/11 | 5.000:12 | | |
| Total For All Shapes | | | 10436 | 13060 | 11777 | | | | | |

**Loads and Codes - Shape: Boat Storage Building**
City: Stennis Space Center County: Hancock State: Mississippi Country: United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Loads and Codes - Shape: Clerestory A**
City: Stennis Space Center County: Hancock State: Mississippi Country: United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.741)
Parts Wind Exposure Factor: 0.741

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1



SCANNED
Date 21 APR 09 Initials MDE

REVIEWED
MDE
21 APR 09

# VP Buildings

3200 Players Club Circle
Memphis, TN 38125-8843

# STRUCTURAL DESIGN DATA

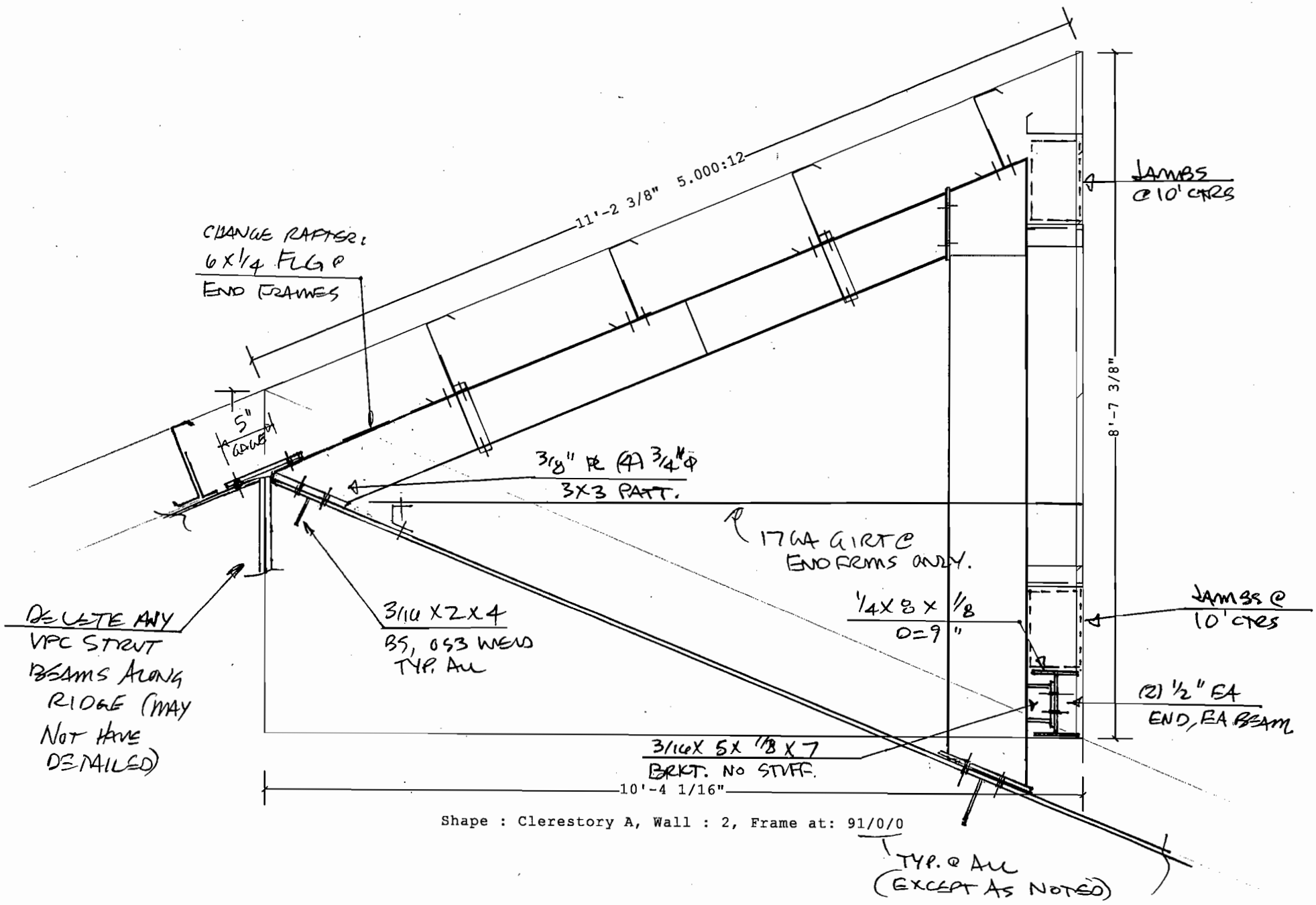
Project: Riverine and Combatant Craft Operations Facility
Name: 08-28914 EP3
Builder PO #:
Jobsite:

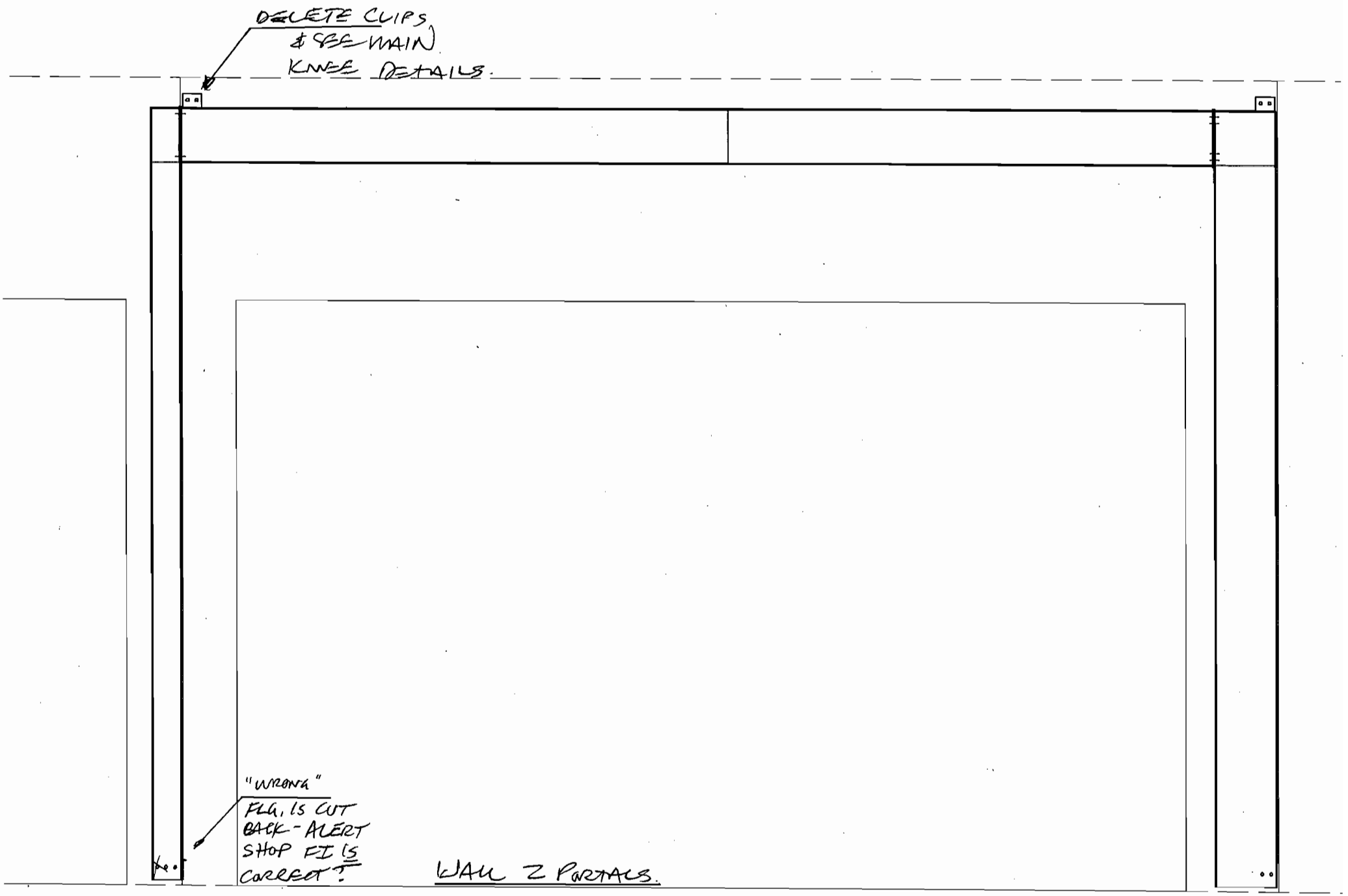
City, State: Stennis Space Center, Mississippi 39529
County: Hancock
Country: United States

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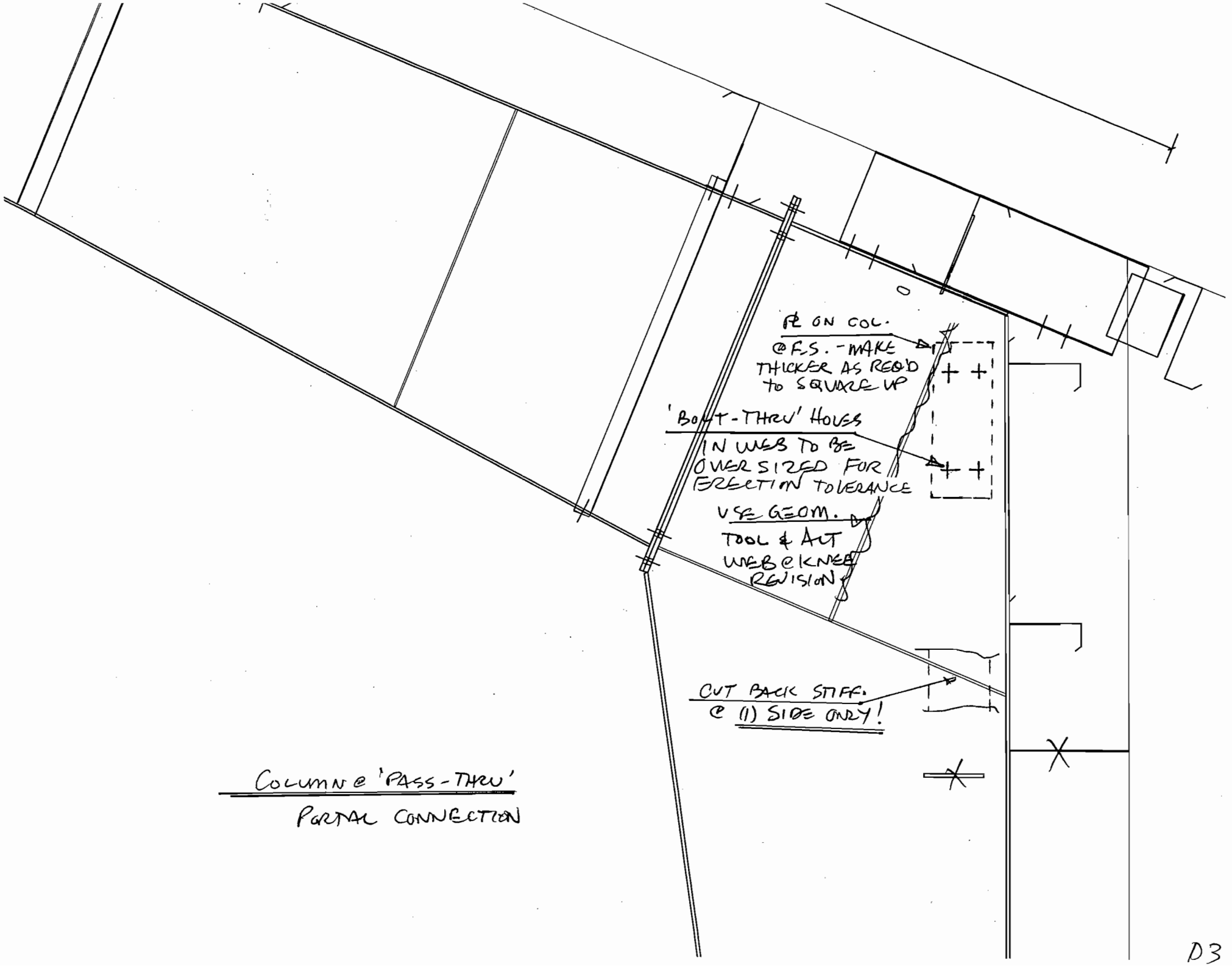
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* CHANGES PER 01-010 *

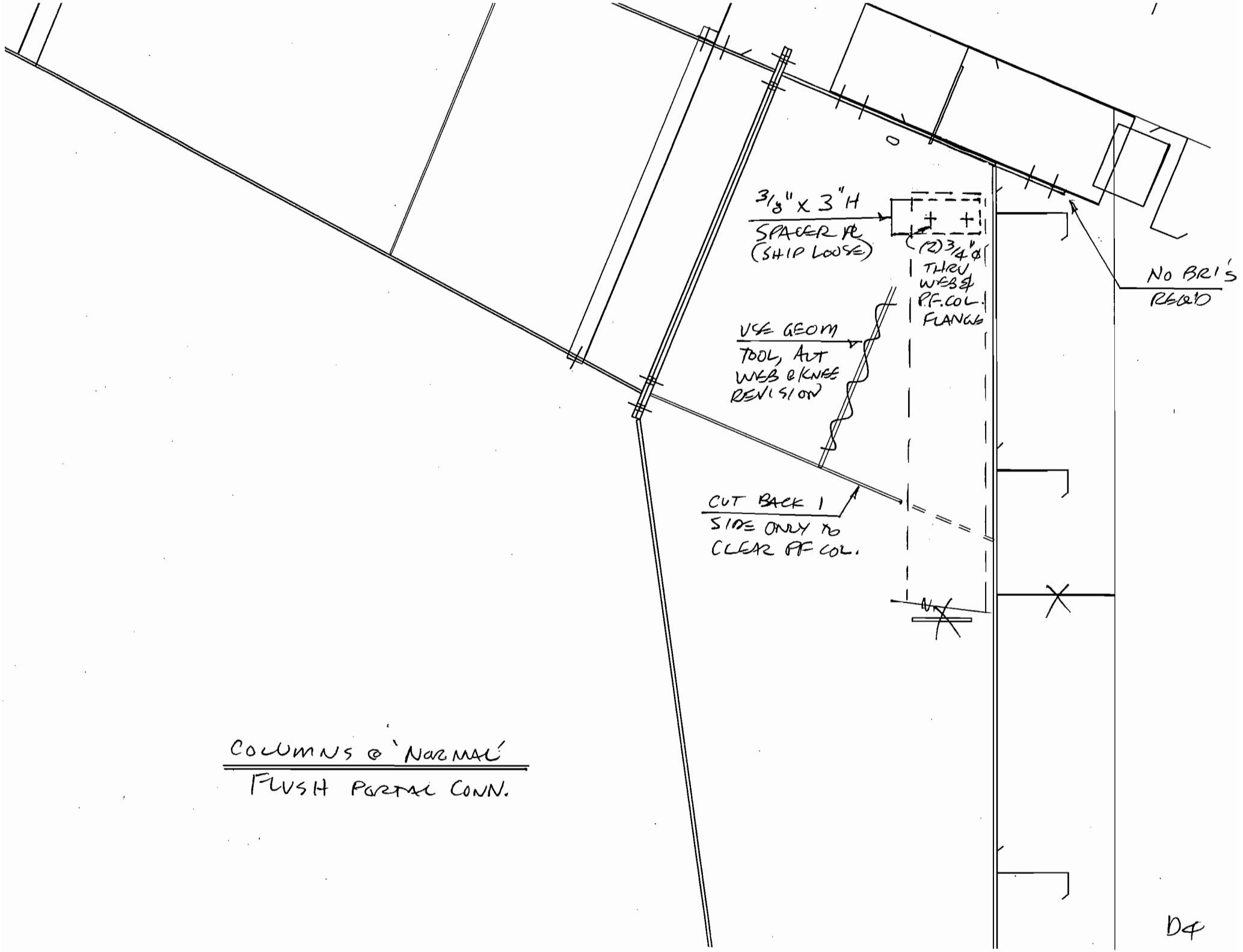

11'-2 3/8" 5.000:12
CHANGE RAFTER:
6 X 1/4 FLG @
END FRAMES
5"
3/8" PL @ 3 3/4" Φ
3X3 PATT.
17GA GIRT @
END FRMS ONLY.
DELETE ANY
VFC STRUT
BEAMS ALONG
RIDGE (MAY
NOT HAVE
DETAILED)
3/16 X 2 X 4
BS, OS3 WELD
TYP. ALL
1/4 X 8 X 1/8
O=9"
JAMBS
@ 10' CTRS
JAMBS @
10' CTRS
8'-7 3/8"
(2) 1/2" EA
END, EA BEAM
3/16 X 5 X 1/8 X 7
BRKT. NO STIFF.
10'-4 1/16"
Shape : Clerestory A, Wall : 2, Frame at: 91/0/0
TYP. @ ALL
(EXCEPT AS NOTED)


DELETE CLIPS & SEE MAIN KNEE DETAILS.
"WRONG" FLG. IS CUT BACK - ALERT SHOP FI IS CORRECT!
WALL 2 PORTALS.

D2



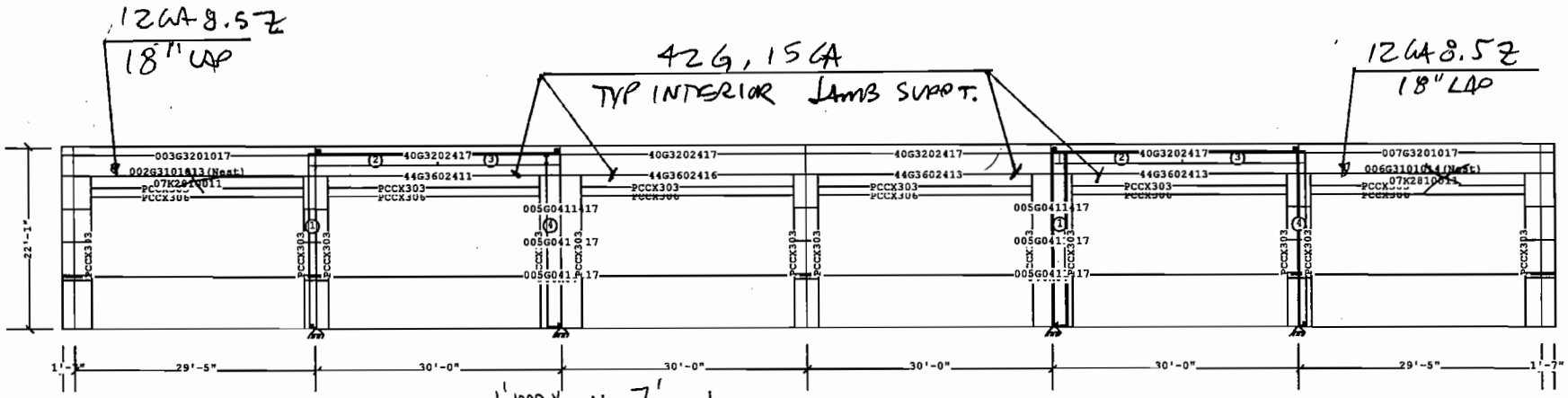

COLUMN @ 'PASS-THRU' PORTAL CONNECTION

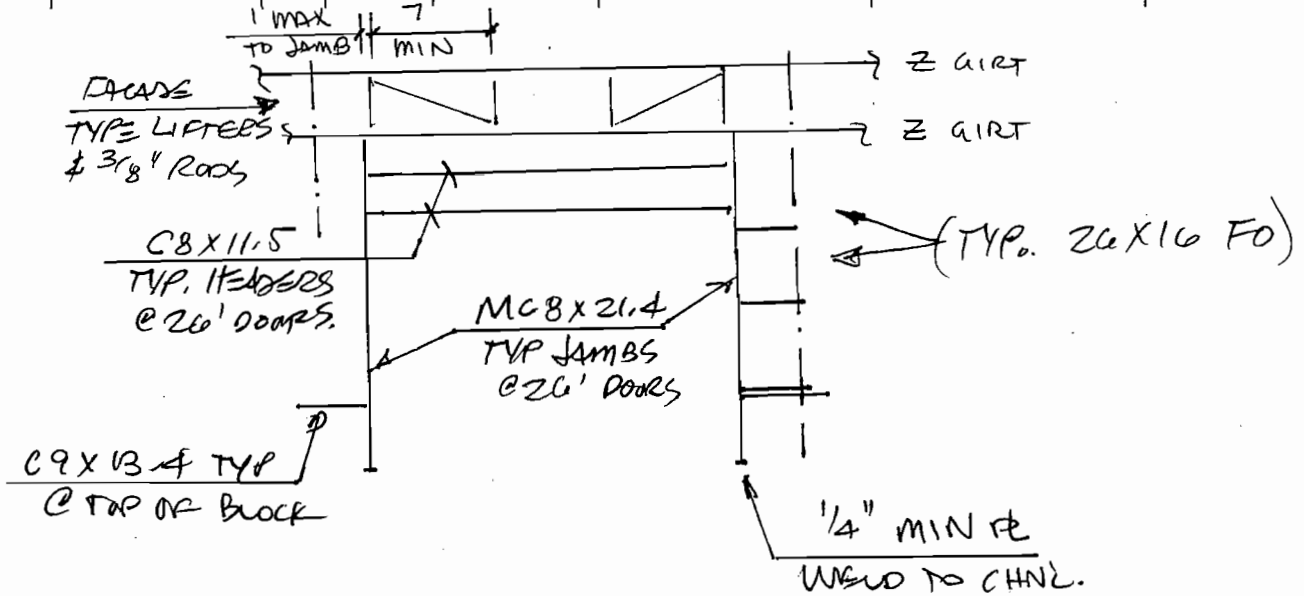



COLUMNS @ 'NORMAL'
FLUSH PORTAL CONN.

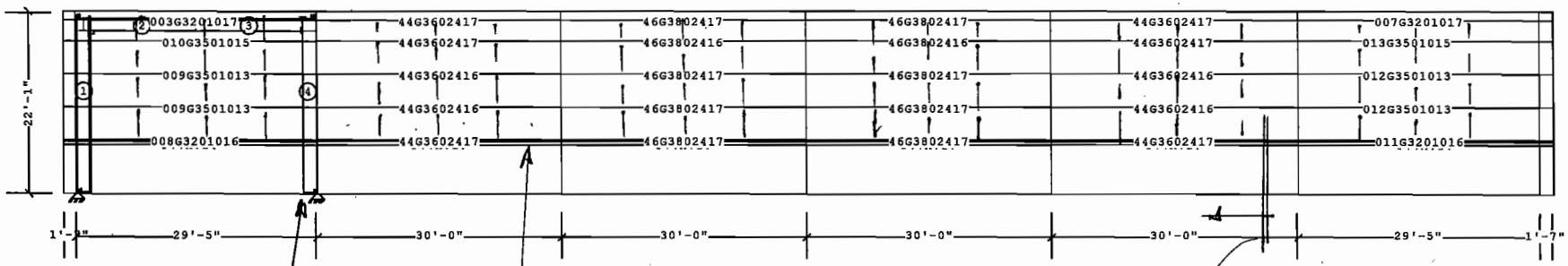
D4

THIS WALL HAD SOME RANDOM SECONDARY SEGMENTS OVERLAID ON NORMAL SEGMENTS
-DELETE THEM-



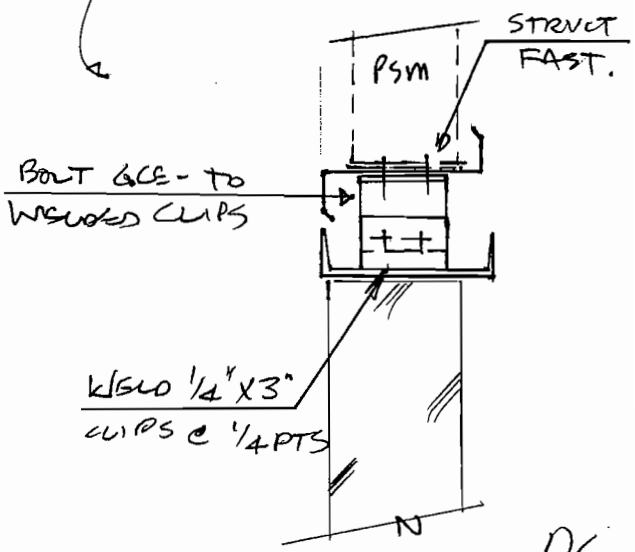




WALL 2



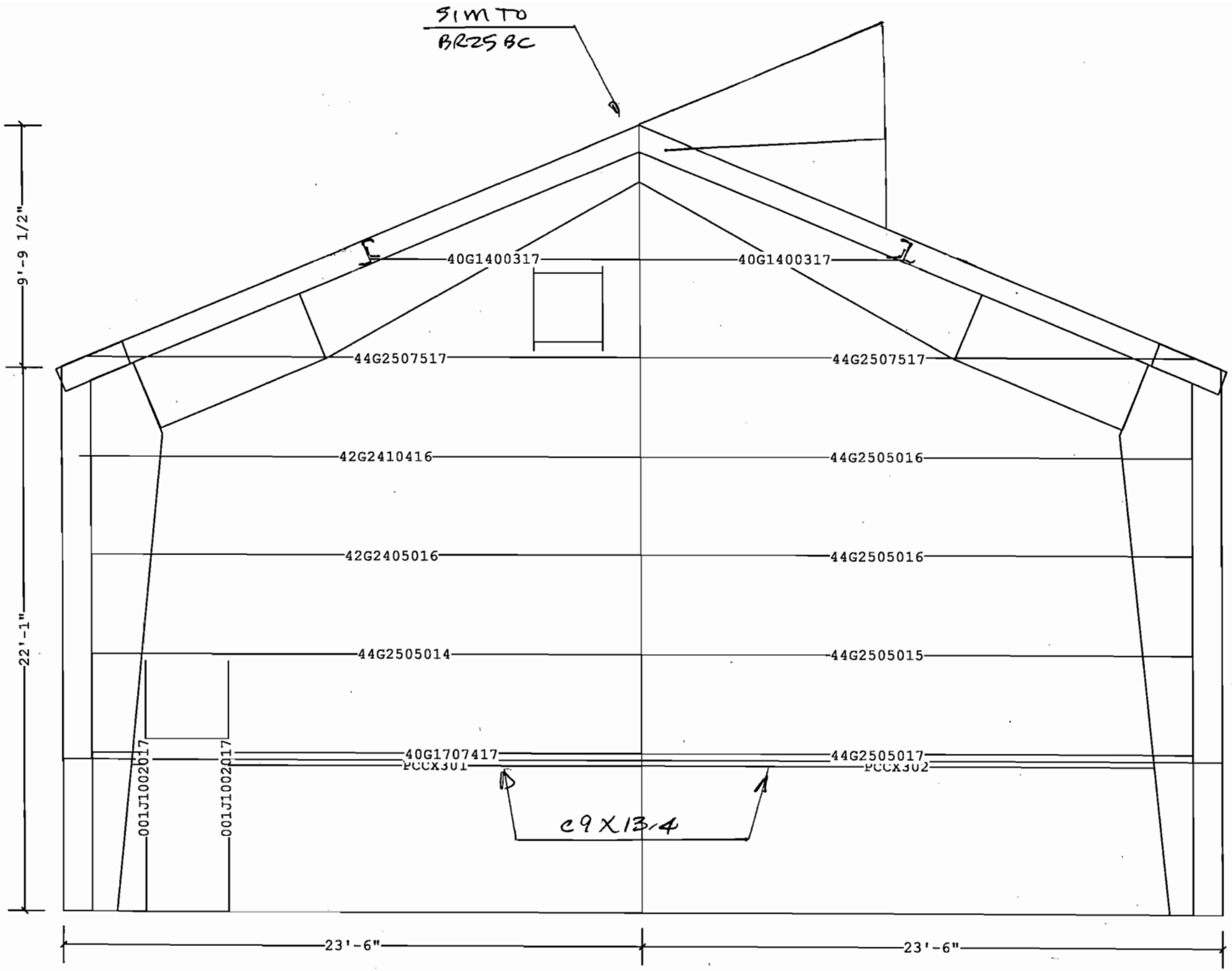

MUST USE
ALT WEB @
TOP P.F. COL.

TYP CHANNEL:
C9X13.4



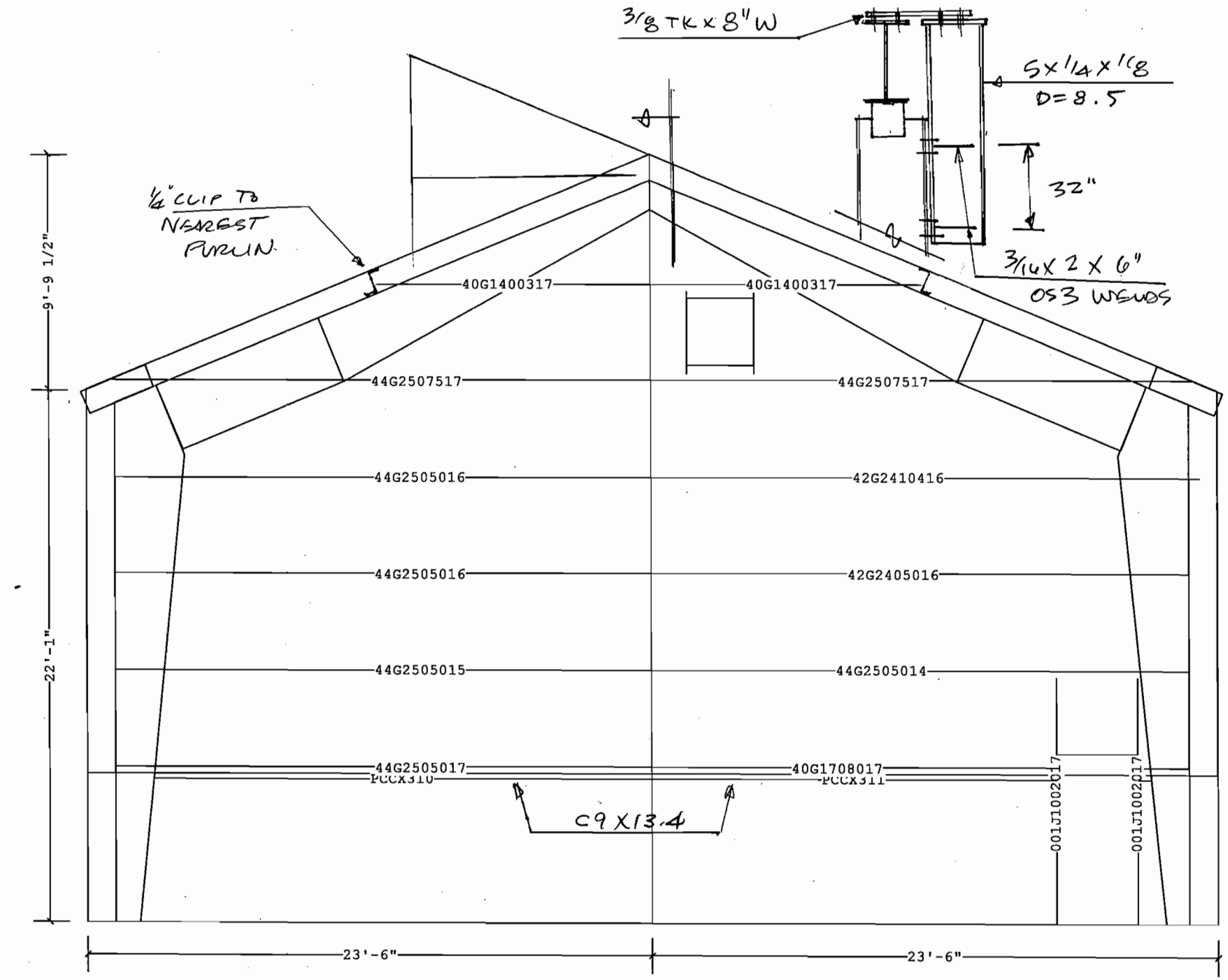

WALL 4

D6


SIMTO
BR25BC
9'-9 1/2"
22'-1"
40G1400317
40G1400317
44G2507517
44G2507517
42G2410416
44G2505016
42G2405016
44G2505016
44G2505014
44G2505015
001J1002017
001J1002017
40G1707417
44G2505017
PCCX301
PCCX302
c9X13.4
23'-6"
23'-6"

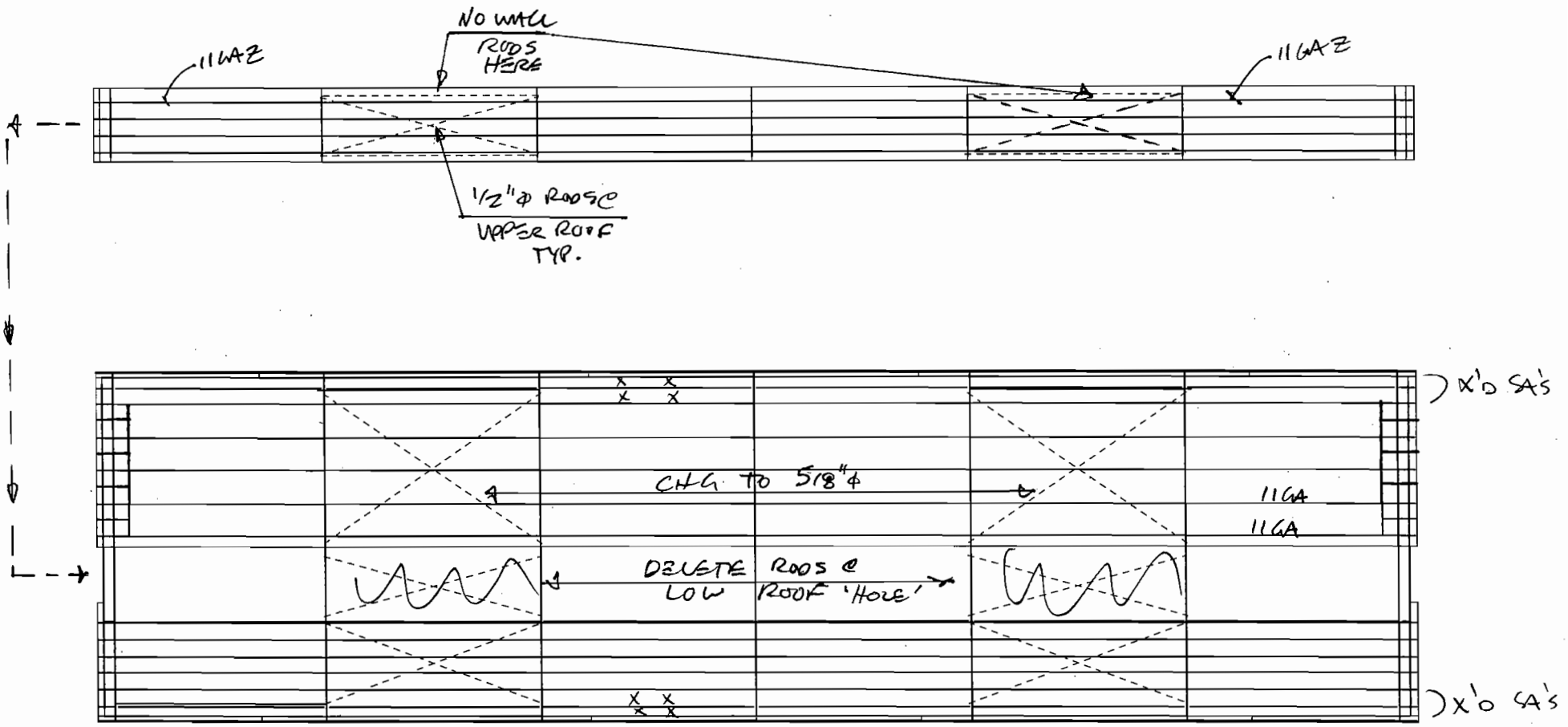
WALL 1

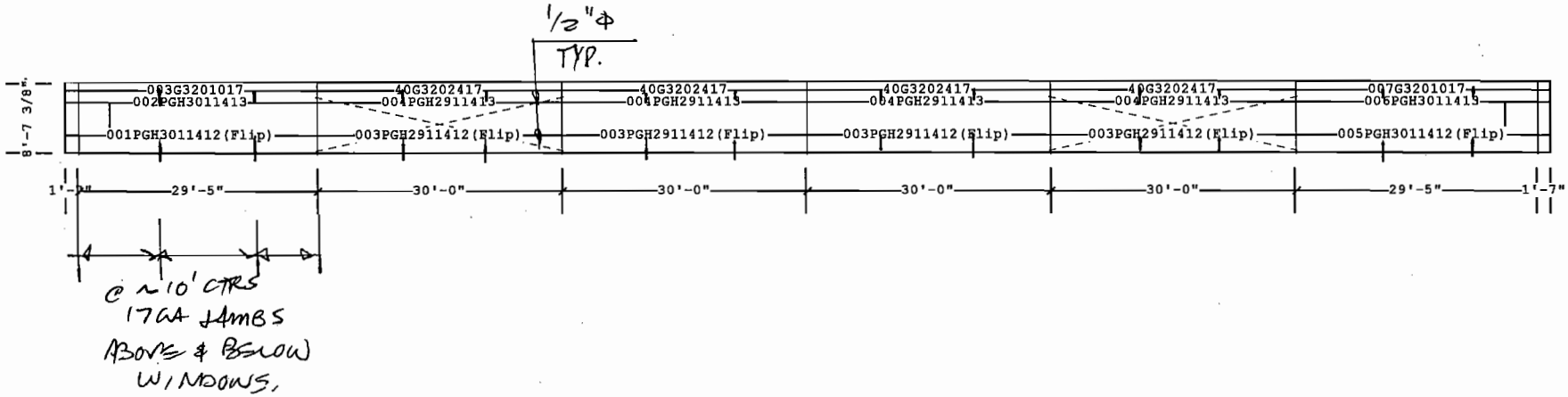
D7


3/8 TK x 8" W
5 x 1/4 x 1'8
D=8.5
32"
3/16 X 2 X 6"
053 WELDS
1/4" CLIP TO NEAREST PURLIN
40G1400317
40G1400317
44G2507517
44G2507517
44G2505016
42G2410416
44G2505016
42G2405016
44G2505015
44G2505014
44G2505017
PCCX310
40G1708017
PCCX311
C9 X 13.4
001J1002017
001J1002017
9'-9 1/2"
22'-1"
23'-6"
23'-6"

WALL 3

D8


NO WALL RODS HERE
11GAZ
11GAZ
1/2"ø RODS@ UPPER ROOF TYP.
X'D SA's
CHG TO 5/8"ø
11GA
11GA
DELETE RODS @ LOW ROOF 'HOLE'
X'D SA's




CLERESTORY
HIGH SIDE

D10

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 30/0/0
Primary Zone Strip Width: 18/2/12
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 27.24 psf

Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4973
Bracing Seismic Period: 0.2968
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

The steel design is in accordance with VP BUILDINGS standard design practices, which have been established based upon pertinent procedures and recommendations of the following organizations:

American Institute of Steel Construction (AISC)
American Iron and Steel Institute (AISI)
American Welding Society (AWS)
American Society for Testing and Materials (ASTM)
Canadian Standards Association
CSA W59-Welded Steel Construction
Limit State Design of Steel Structures
Metal Building Manufacturers Association (MBMA)
VP Buildings is certified by:
- CSA A660 Certified (Design and Manufacturing)
- IAS Approved Fabricator
- Canadian Welding Bureau Div. 1 Certified

VP Buildings has designed the structural steel components of this building in accordance with the Building Code, Steel Specifications, and Standards indicated above. Steel components are designed utilizing the following steel grades unless noted otherwise:

3 Plate members fabricated from plate, bar, strip steel or sheets
ASTM A529, A572, A1011 - All Grade 55 ksi
Hot Rolled Shapes (W, S, C, Angles, etc)
ASTM A36, or ASTM A36Mod50, A529, A572, A588, A709, A992-All Grade 50 ksi
Tube and Pipe Sections ASTM A500, Grade B (Fy - 42 ksi pipe, Fy - 46 ksi tube)
Light Gage Sections ASTM A1011 SS Grade 55 ksi, A653 SS Grade 60 ksi
Round Rod Bracing ASTM A572 Grade 50 ksi

This certification DOES NOT apply to the design of the foundation or other on-site structures or components not supplied by VP BUILDINGS, nor does it apply to unauthorized modifications to framing systems provided by VP BUILDINGS.

Furthermore, it is understood that certification is based upon the premise that all components furnished by VP BUILDINGS will be erected or constructed in strict compliance with pertinent documents furnished by VP BUILDINGS.

Sincerely,

_____ P.E. Prepared by: _____ Reviewed by: _____

VP BUILDINGS
3200 Players Club Circle, Memphis TN 38125-8843





## Building Loading - Summary Report

### Shape: Boat Storage Building

**Loads and Codes - Shape: Boat Storage Building**

City: Stennis Space Center County: Hancock State: Mississippi Country: United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |

| | | | | |
|---|---|---|---|---|
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 8) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 8) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 19 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |





| | | | | |
|---|---|---|---|---|
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 CG + 1.0 W1> | CG + W1> |
| 2 | System | 1.000 | 1.0 CG + 1.0 <W2 | CG + <W2 |
| 3 | System | 1.000 | 1.0 CG + 1.0 WP | CG + WP |
| 4 | System | 1.000 | 1.0 CG + 0.700 E> | CG + E> |
| 5 | System | 1.000 | 1.0 CG + 0.700 <E | CG + <E |

**Design Load Combinations - Roof - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 L | D + L |
| 2 | System | 1.000 | 1.0 D + 1.0 S | D + S |
| 3 | System | 1.000 | 1.0 D + 1.0 US1* | D + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 *US1 | D + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 W1> | D + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 <W2 | D + <W2 |
| 7 | System | 1.000 | 0.600 D + 1.0 W1> | D + W1> |
| 8 | System | 1.000 | 0.600 D + 1.0 <W2 | D + <W2 |

**Design Load Combinations - Wall - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 0.500 <E | <E |

**Deflection Load Combinations - Roof - Panel**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 1.0 S | S |
| 2 | System | 1.000 | 150 | 150 | 1.0 US1* | US1* |
| 3 | System | 1.000 | 150 | 150 | 1.0 *US1 | *US1 |

**User Applied Surface Loads (Local Coordinate System)**

| Side | Shape | Units | Type | Description | Mag | X-Loc | Y-Loc | Frm | Brc | Grt | Pur | Pnl | Supp. | Dir. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | LN | plf | W1> | Clerestory | 136.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | W1> | Clerestory | 136.00 | 182/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | W2> | Clerestory | 240.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | W2> | Clerestory | 240.00 | 182/0/0 | 21/0/0 | Y | N | N | N | N | N | IN | OF |
| 4 | LN | plf | <W1 | Clerestory | 169.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| 4 | LN | plf | <W1 | Clerestory | 169.00 | 182/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| 4 | LN | plf | <W2 | Clerestory | 66.00 | 0/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| 4 | LN | plf | <W2 | Clerestory | 66.00 | 182/0/0 | 21/0/0 | Y | N | N | N | N | N | OUT | OF |
| A | LN | plf | CG | Clerestory | 240.00 | 0/0/0 | -8/6/0 | Y | N | N | N | N | N | IN | OF |
| A | LN | plf | CG | Clerestory | 240.00 | 182/0/0 | -8/6/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 0/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 182/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 1.80 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 2.33 | 0/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 2.33 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 2.33 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | D | Upper Roof | 2.33 | 182/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | CG | Upper Roof | 5.00 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | CG | Upper Roof | 5.00 | 0/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | CG | Upper Roof | 5.00 | 182/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | CG | Upper Roof | 5.00 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 0/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 182/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | L | Upper Roof | 20.00 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.30 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.30 | 0/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.30 | 182/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | S | Upper Roof | 2.30 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 0/0/0 | -9/1/3 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 12/4/0 | -9/1/3 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 12/4/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |





| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | RC | psf | W | Upper Roof | 24.99 | -1/1/8 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | -1/1/8 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 0/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 0/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 182/0/0 | -9/1/3 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 169/7/10 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 169/7/10 | -9/1/3 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 182/0/0 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 182/0/0 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 183/1/8 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 183/1/8 | -8/5/5 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 12/4/6 | -9/1/3 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 12/4/6 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 169/7/10 | 0/0/0 | Y | N | N | N | N | N | IN | OF |
| A | RC | psf | W | Upper Roof | 24.99 | 169/7/10 | -9/1/3 | Y | N | N | N | N | N | IN | OF |

LEFT OLD LD W HWY. FRAMING @ WINDOWS IN - IT'LL BE LESS AS BUILT.

**User Defined Frame Point Loads for Cross Section:**

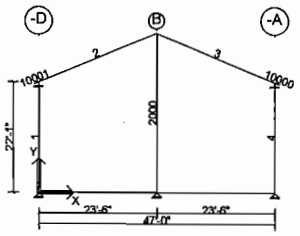
| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2221.46 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 3920.23 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -2760.49 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1078.06 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -3932.47 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 0/0/0 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 8/5/5 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 0/0/0 | -37.98 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 8/5/5 | -37.97 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 0/0/0 | -81.67 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 8/5/5 | -81.65 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.00 | 0/0/0 | 132.00 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.00 | 8/5/5 | 132.00 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.58 | 0/0/0 | 174.58 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.58 | 8/5/5 | 174.58 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.32 | 0/0/0 | 38.32 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.32 | 8/5/5 | 38.32 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 80.90 | 0/0/0 | 80.90 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 80.90 | 8/5/5 | 80.90 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 0/0/0 | 74.84 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 8/5/5 | 74.84 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 0/0/0 | 98.97 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 8/5/5 | 98.97 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 0/0/0 | 21.72 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 8/5/5 | 21.72 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 0/0/0 | 45.86 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 8/5/5 | 45.86 | 9/1/1 | N | UP | 0.311 | OF |





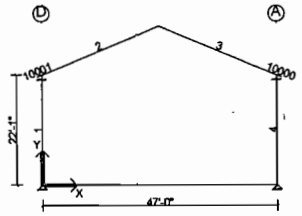


**User Defined Frame Point Loads for Cross Section: 3**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4040.33 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7130.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5020.71 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1960.75 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7130.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 3**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -53.47 | 0/0/0 | -53.47 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.07 | 0/0/0 | -69.07 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -148.54 | 0/0/0 | -148.54 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 24.90 | 0/0/0 | 24.90 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 32.94 | 0/0/0 | 32.94 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 7.23 | 0/0/0 | 7.23 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 15.26 | 0/0/0 | 15.26 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 351.60 | 0/0/0 | 351.60 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 465.01 | 0/0/0 | 465.01 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 102.06 | 0/0/0 | 102.06 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 215.47 | 0/0/0 | 215.47 | 9/1/1 | N | UP | 0.311 | OF |





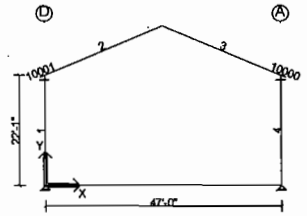



**User Defined Frame Point Loads for Cross Section: 4**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4080.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7200.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5070.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1980.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7200.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 4**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -54.00 | 0/0/0 | -54.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.75 | 0/0/0 | -69.75 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -150.00 | 0/0/0 | -150.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 380.34 | 0/0/0 | 380.34 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 503.03 | 0/0/0 | 503.03 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 110.41 | 0/0/0 | 110.41 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 233.09 | 0/0/0 | 233.09 | 9/1/1 | N | UP | 0.311 | OF |

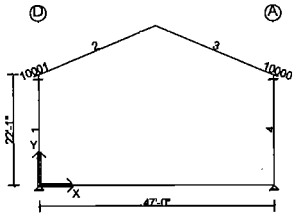


**User Defined Frame Point Loads for Cross Section: 5**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4080.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7200.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5070.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1980.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7200.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 5**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -54.00 | 0/0/0 | -54.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.75 | 0/0/0 | -69.75 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -150.00 | 0/0/0 | -150.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 380.34 | 0/0/0 | 380.34 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 503.03 | 0/0/0 | 503.03 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 110.41 | 0/0/0 | 110.41 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 233.09 | 0/0/0 | 233.09 | 9/1/1 | N | UP | 0.311 | OF |





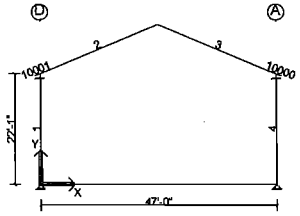



**User Defined Frame Point Loads for Cross Section: 6**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4080.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7200.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5070.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1980.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7200.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 6**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -54.00 | 0/0/0 | -54.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.75 | 0/0/0 | -69.75 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -150.00 | 0/0/0 | -150.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 380.34 | 0/0/0 | 380.34 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 503.03 | 0/0/0 | 503.03 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 110.41 | 0/0/0 | 110.41 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 233.09 | 0/0/0 | 233.09 | 9/1/1 | N | UP | 0.311 | OF |

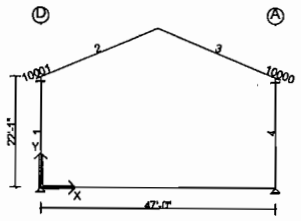


**User Defined Frame Point Loads for Cross Section: 7**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4040.33 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7130.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5020.71 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1960.75 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7130.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 7**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -53.47 | 0/0/0 | -53.47 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.07 | 0/0/0 | -69.07 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -148.54 | 0/0/0 | -148.54 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 25.05 | 0/0/0 | 25.05 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 33.13 | 0/0/0 | 33.13 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 7.27 | 0/0/0 | 7.27 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 15.35 | 0/0/0 | 15.35 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 351.60 | 0/0/0 | 351.60 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 465.01 | 0/0/0 | 465.01 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 102.06 | 0/0/0 | 102.06 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 215.47 | 0/0/0 | 215.47 | 9/1/1 | N | UP | 0.311 | OF |





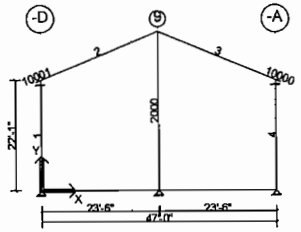



**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2221.46 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 3920.23 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -2760.49 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1078.06 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -3932.47 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 0/0/0 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 8/5/5 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 0/0/0 | -37.98 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 8/5/5 | -37.97 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 0/0/0 | -81.67 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 8/5/5 | -81.65 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.25 | 0/0/0 | 132.25 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.25 | 8/5/5 | 132.25 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.91 | 0/0/0 | 174.91 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.91 | 8/5/5 | 174.91 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.39 | 0/0/0 | 38.39 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.39 | 8/5/5 | 38.39 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 81.05 | 0/0/0 | 81.05 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 81.05 | 8/5/5 | 81.05 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 0/0/0 | 74.84 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 8/5/5 | 74.84 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 0/0/0 | 98.97 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 8/5/5 | 98.97 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 0/0/0 | 21.72 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 8/5/5 | 21.72 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 0/0/0 | 45.86 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 8/5/5 | 45.86 | 9/1/1 | N | UP | 0.311 | OF |








## Shape: Clerestory A

**Loads and Codes - Shape: Clerestory A**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.741)
Parts Wind Exposure Factor: 0.741

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 30/0/0
Primary Zone Strip Width: 18/2/12
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 27.24 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4973
Bracing Seismic Period: 0.2968
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |

| | | | | |
|---|---|---|---|---|
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 8) |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 8) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 23 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 25 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 27 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |





| | | | | |
|---|---|---|---|---|
| 31 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 43 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |

**Design Load Combinations - Roof - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 L | D + L |
| 2 | System | 1.000 | 1.0 D + 1.0 S | D + S |
| 3 | System | 1.000 | 1.0 D + 1.0 W1> | D + W1> |
| 4 | System | 1.000 | 1.0 D + 1.0 <W2 | D + <W2 |
| 5 | System | 1.000 | 0.600 D + 1.0 W1> | D + W1> |
| 6 | System | 1.000 | 0.600 D + 1.0 <W2 | D + <W2 |

**Design Load Combinations - Wall - Panel**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |

**Deflection Load Combinations - Framing**

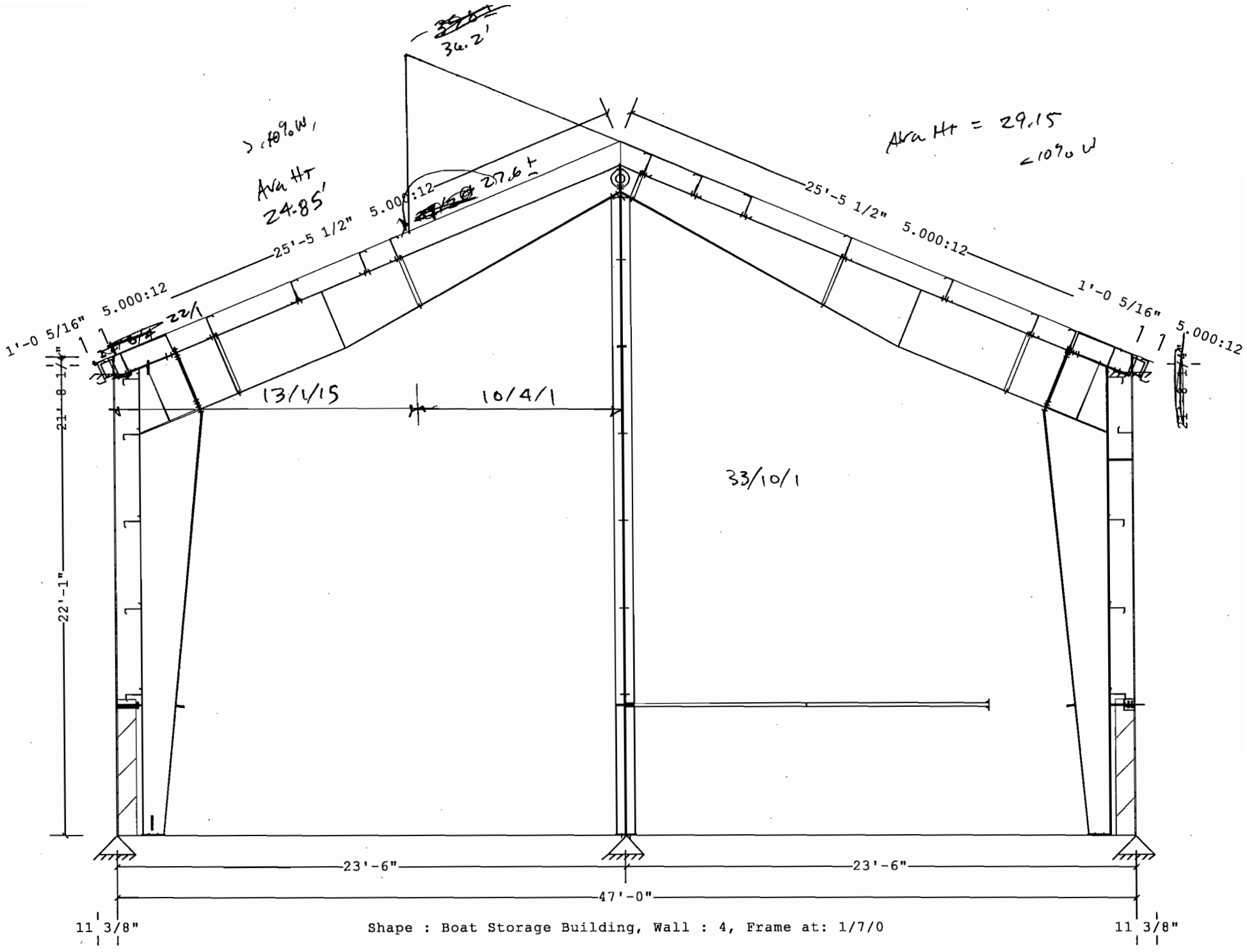
| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Deflection Load Combinations - Purlin**

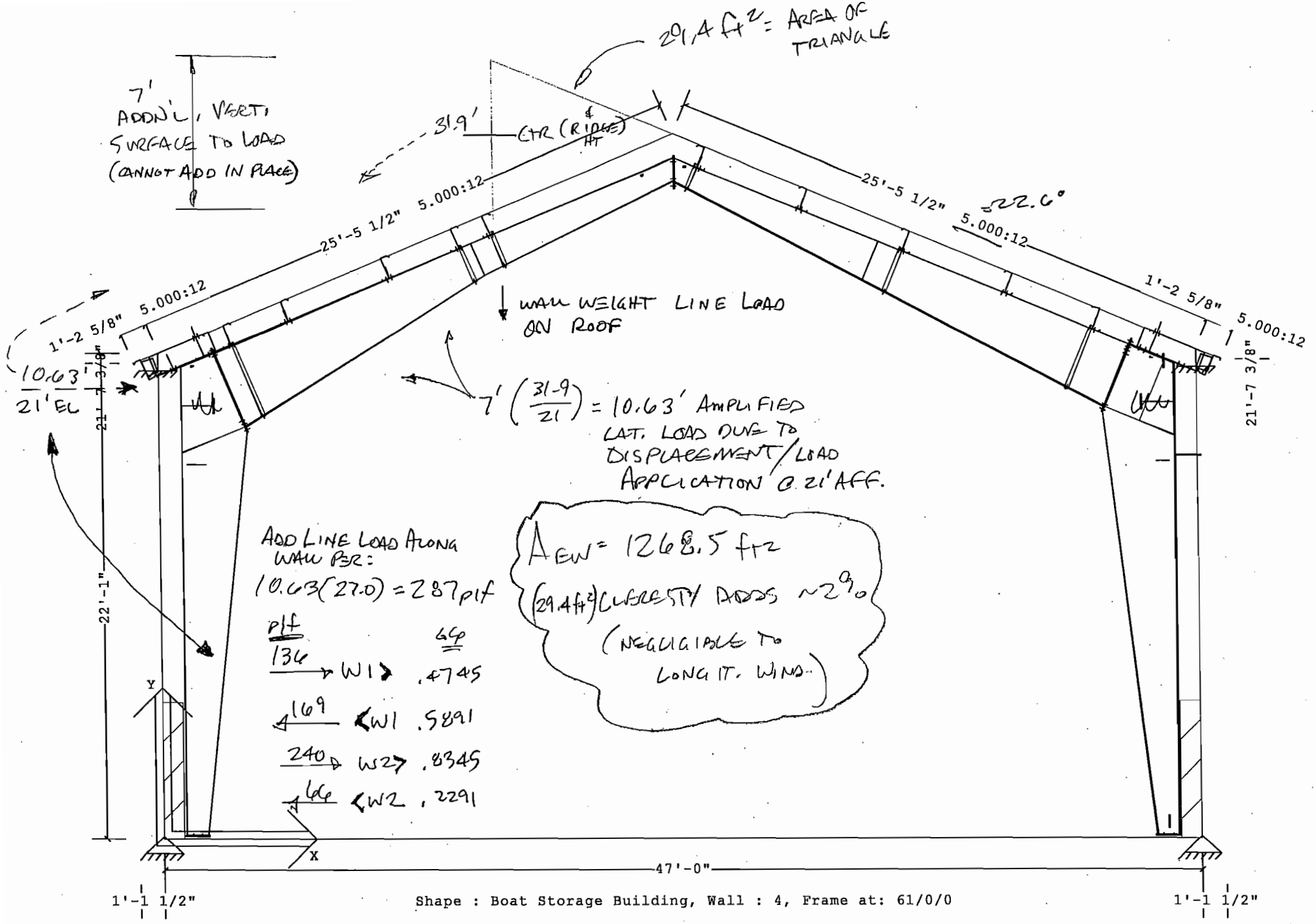
| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |




Shape : Boat Storage Building, Wall : 4, Frame at: 1/7/0




Shape : Boat Storage Building, Wall : 4, Frame at: 61/0/0

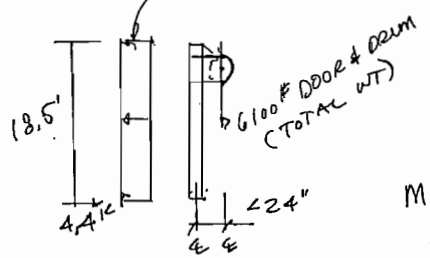
| Part Mark Key | |
|---|---|
| 1 | G378 |
| 2 | G381(Typ.) |
| 3 | G382 |
| 4 | G381 |

**Secondary Part Schedule**

| Mark | Part | Thick. | Depth | Lap |
|---|---|---|---|---|
| | 07K2810011 | 0.1200 | 8 1/2" | |
| | PCCX300 | 0.2000 | 6" | |
| | PCCX301 | 0.5100 | 1'-0" | |
| | PCCX302 | 0.2200 | 8" | |
| G306 | 40G3202417 | 0.0590 | 8 1/2" | 1'-0" |
| G378 | 001G0305417 | 0.0590 | 8 1/2" | |
| G379 | 000G31010## | 0.1200 | 8 1/2" | |
| G380 | 002G3201017 | 0.0590 | 8 1/2" | 1'-0" |
| G381 | 003G0211417 | 0.0590 | 8 1/2" | |
| G382 | 004G0411417 | 0.0590 | 8 1/2" | |
| G383 | 46G3802### | 0.1200 | 8 1/2" | 4'-0" |
| G384 | 46G3802412 | 0.1050 | 8 1/2" | 4'-0" |
| G385 | 005G3201017 | 0.0590 | 8 1/2" | 1'-0" |

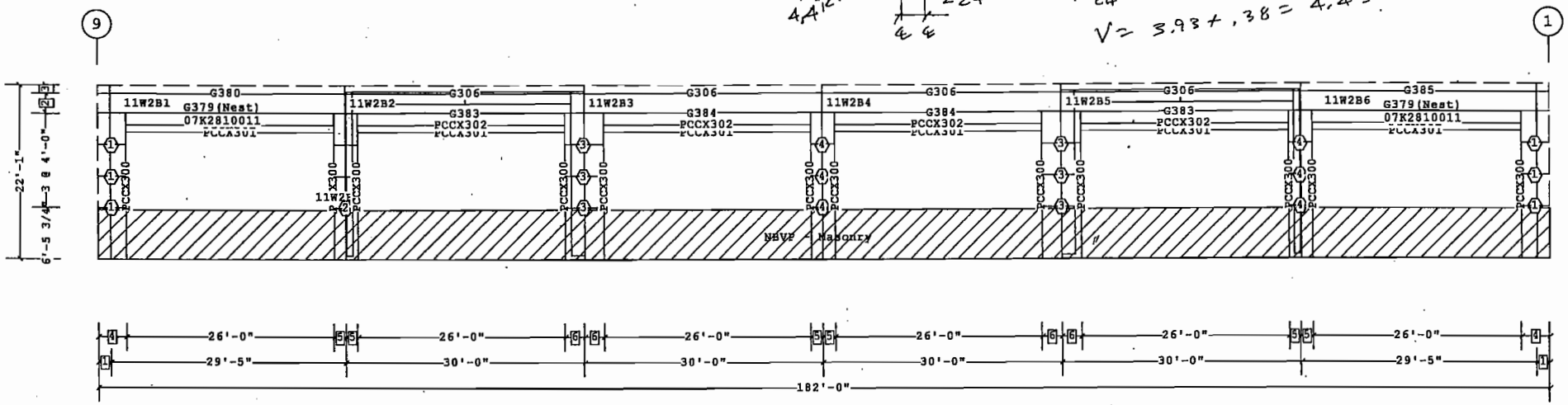
26X14 DOOR JAMB
DRUM = 6100#

27#(1.05)(15) = 425 plf SUCTION.




$M_{c4} = 218 + 73 = 291$ in-k

$V = 3.93 + .38 = 4.4^{\pm}$




SECONDARY ELEVATION AT A

| Frame Member Schedule | | | | |
|---|---|---|---|---|
| Part | Width | Thick. Webthk | Depth1 | Approx. Lgth |
| PCCX300 | ~~CH 6 x 8.20~~ | | ~~6"~~ 8" | 18'-5 3/4" |
| PCCX301 | ~~CH 12 x 30.00~~ | | ~~11-0"~~ 5" | 26'-0" |
| PCCX302 | CH 8 x 11.50 | | 8" | 26'-0" |

MC8X21.4
C8X11.5

BLOCK SUPT:

3.3' TA, w=3.3(1.05)(25.9) = 89.4

4/300 = 1", Ir = 56.2 x .75 = 42.

C9X13.4 WORKS WELL FOR ALL LOCATIONS

| | |
|---|---|
| 6 | 2'-6" |
| 5 | 1'-6" |
| 4 | 3'-6" |
| 3 | 1'-0 11/16" |
| 2 | 2'-6 9/16" |
| 1 | 1'-7" |

☐ Dimension Key

Shape Name = Boat Storage Building, Wall = 2

FOR APPROVAL- NOT FOR CONSTRUCTION

1. UNLESS NOTED, USE 1/2 X 1 1/2 A-325 SNUG TIGHTENED BOLTS FOR GIRT LAP, GIRT TO FRAME, FLANGE BRACE TO FRAME, FLANGE BRACE TO GIRT, JAMB AND HEADER CONNECTIONS.
2. WIND AND FLANGE BRACING ARE AN INTEGRAL PART OF THE WALL STRUCTURAL SYSTEM AND SHOULD BE PROPERLY INSTALLED PRIOR TO ERECTION OF WALL AND ROOF SHEETS. REMOVAL OR ALTERATION OF WALL BRACING WITHOUT PRIOR AUTHORIZATION IS PROHIBITED.

THE VP ENGINEER'S SEAL APPLIES ONLY TO THE WORK PRODUCT OF VP AND DESIGN AND PERFORMANCE REQUIREMENTS SPECIFIED BY VP. THE VP ENGINEER'S SEAL DOES NOT APPLY TO THE PERFORMANCE OR DESIGN OF ANY OTHER PRODUCT OR COMPONENT FURNISHED BY VP EXCEPT TO ANY DESIGN OR PERFORMANCE REQUIREMENTS SPECIFIED BY VP.

THIS DRAWING, INCLUDING THE INFORMATION HEREON, REMAINS THE PROPERTY OF VP BUILDINGS.
IT IS PROVIDED SOLELY FOR ERECTING THE BUILDING DESCRIBED IN THE APPLICABLE PURCHASE ORDER AND SHALL NOT BE MODIFIED, REPRODUCED OR USED FOR ANY OTHER PURPOSE WITHOUT PRIOR WRITTEN APPROVAL OF VP BUILDINGS.

THE GENERAL CONTRACTOR AND/OR ERECTOR IS SOLELY RESPONSIBLE FOR ACCURATE, GOOD QUALITY WORKMANSHIP IN ERECTING THIS BUILDING IN CONFORMANCE WITH THIS DRAWING, DETAILS REFERENCED IN THIS DRAWING, ALL APPLICABLE VP ERECTION GUIDES, AND INDUSTRY STANDARDS PERTAINING TO PROPER ERECTION, INCLUDING THE CORRECT USE OF TEMPORARY BRACING.

VP Buildings
3200 Players Club Circle Memphis TN 38125

| REV | DATE | BY | DESCRIPTION |
|---|---|---|---|
| | | | |

NTS

2/3/2009 13:29:52

**SECONDARY ELEVATION AT A**

BUILDER: Broadmoor, LLC
CUSTOMER: John F. Stennis Space Center
LOCATION: Stennis Space Center, Mississippi
PROJECT: Riverine and Combatant Craft Operations Facility
BUILDER'S PO#:
FILENAME: 08-28914 EP3.VPC

VP BUILDINGS
A MiTek Industries Company
VPC VERSION: 7.1C

JOB # 08-28914
DATE
DRAWN/CHECK RAT /
PAGE

# BLUESCOPE CONSTRUCTION ENGINEERING DATA

Version 1.07

| JOB | MADE BY | CKD. BY | DATE | PAGE | OF |
|---|---|---|---|---|---|
| SPANDREL @ 6'-5 3/4 / PERIM | MDE | | 2/6/2009 | 1 | 1 |
| **Mill W & C Sections Design & Optimize** | REVISION 1 | | | PROJECT NO. | |
| **ANSI/AISC 360-2005** (database v13.0) | REVISION 2 | | | 08-28914 | |

## 1. Input

**Section Criteria** Channels only ▼ | Not required ▼

| | | | x-axis | y-axis | z-axis |
|---|---|---|---|---|---|
| Member length, L = | 30.00 ' | Buckling length = | 30.00 ' | 30.00 ' | 30.00 ' |
| Comp flg unbraced length, Lb = | 8.00 ' | Effective length factor, K = | 1.00 | 1.00 | 1.00 |
| Yielding stress, Fy (ksi) = | 36 | **Note:** Any input Cb other than zero overrides calculated Cb | | | |
| E (ksi) = | 29000 | | | | |

**Input Cb (1 to 3.0) = 1.00**

**Design method:** ASD (Input all loads as +)

| Required Strength | Axial Comp. C (kips) | Axial Tension T (kips) | Shear force V (kips) | Bending Moments $Mx_{max}$ (in-kip) | Bending Moments $My_{max}$ (in-kip) | Moments for computing Cb: 1/4-point $M_a$ (in-kip) | 1/2-point $M_b$ (in-kip) | 3/4-point $M_c$ (in-kip) |
|---|---|---|---|---|---|---|---|---|
| **ASD** | 1.00 | 0.00 | 2.00 | 90.00 | 0.00 | 90.00 | 90.00 | 90.00 |
| Not req'd=> **LRFD** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | Low limit | Up limit | |
|---|---|---|---|
| Combined Strength Ratio (CSR) | 0.3 | 1.03 | (Flexure & comp. combined) |

**Design** <= Press this button after input changed.

## 2. Output

C9X13.4 ▼ <= Select a section to display

| | Comp & Flexure ASD | Comp & Flexure LRFD | Tension & Flexure ASD | Tension & Flexure LRFD | |
|---|---|---|---|---|---|
| **Combined Strength Ratio** | 0.90 | | 0.45 | | $(KL/r)_{max}$ = 540.54 |
| Cb = | 1.00 | | 1.01 | | |

| | ASD Ratio | Stresses (ksi) Actual | Stresses (ksi) Allowable | LRFD Ratio | Strength Required | Strength Design | |
|---|---|---|---|---|---|---|---|
| **Compression** | 0.49 | 0.25 | 0.51 | | | 3.05 | kips |
| **x-axis bending** | 0.45 | 8.49 | 18.71 | | | 298.08 | in-kip |
| y-axis bending | 0.00 | 0.00 | 34.49 | | | 49.46 | in-kip |
| Tension | 0.00 | 0.00 | 21.56 | | | 127.66 | kips |
| Shear | 0.07 | 0.95 | 12.93 | | | 40.77 | kips |

| | **Detail Information:** | | ASD | LRFD | Ref to |
|---|---|---|---|---|---|
| H1.1 | For Pr / Pc ≥ 0.2, | **Pr / Pc** + 8/9 (Mrx / Mcx + Mry / Mcy) = | 0.90 | | Eq (H1-1a) |
| | For Pr / Pc < 0.2, | **Pr / (2Pc)** + (Mrx / Mcx + Mry / Mcy) = | 0.70 | | Eq (H1-1b) |
| H1.3 | In-plane: | When moment primary about x-axis = | 0.46 | | Eq (H1-1)_x |
| | | When moment primary about y-axis = | 0.90 | | Eq (H1-1)_y |
| | Out-of-plane: | $Pr / Pco + (Mr / Mcx)^2$ = | 0.70 | | Eq (H1-2) |
| | | | Lp = | 2.77 ' | Eq (F2-5) |
| | | | Lr = | 10.74 ' | Eq (F2-6) |

A ($in^2$) = 3.94 | Total depth, d = 9.00 " | h = 7.00 "

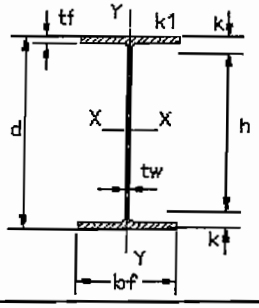
bf = 2.43 " | tw = 0.23 "

tf = 0.41 " | h / tw = 30.04

0.5 bf / tf = 0.00 | For flexure, flange is Compact | For flexure, web is Compact

Qs = 1.00 | Qa = 1.00 | Q=QsQa= 1.00 | $r_{ts}$ = 0.81 "

| | x-axis | y-axis | |
|---|---|---|---|
| **λ = KL/r** = | 103.15 | 540.54 | |
| I = | 47.80 | 1.75 | $in^4$ |
| S = | 10.60 | 0.95 | $in^3$ |
| r = | 3.49 | 0.67 | in |



# BLUESCOPE CONSTRUCTION ENGINEERING DATA

Version 1.07

| JOB | MADE BY | CKD. BY | DATE | PAGE | OF |
|---|---|---|---|---|---|
| JAMS @ 20X16, ORUM = 6100# | MDE | | 2/6/2009 | 1 | 1 |

| Mill W & C Sections Design & Optimize | REVISION | 1 | | PROJECT NO. |
|---|---|---|---|---|
| ANSI/AISC 360-2005 (database v13.0) | | 2 | | 08-28914 |

## 1. Input

Section Criteria: Channels only

Not required

| | | | x-axis | y-axis | z-axis |
|---|---|---|---|---|---|
| Member length, L = | 18.50 ' | Buckling length = | 18.50 ' | 18.50 ' | 18.50 ' |
| Comp flg unbraced length, Lb = | 8.00 ' | Effective length factor, K = | 1.00 | 1.00 | 1.00 |
| Yielding stress, Fy (ksi) = | 36 | | | | |
| E (ksi) = | 29000 | | | | |

**Note:** Any input Cb other than zero overrides calculated Cb

**Input Cb (1 to 3.0) = 1.00**

**Design method:** ASD (Input all loads as +)

| Required Strength | Axial Comp. C (kips) | Axial Tension T (kips) | Shear force V (kips) | Bending Moments $Mx_{max}$ (in-kip) | Bending Moments $My_{max}$ (in-kip) | Moments for computing Cb: 1/4-point $M_a$ (in-kip) | 1/2-point $M_b$ (in-kip) | 3/4-point $M_c$ (in-kip) |
|---|---|---|---|---|---|---|---|---|
| ASD | 3.50 | 0.00 | 4.40 | 291.00 | 0.00 | 291.00 | 291.00 | 291.00 |
| Not req'd=> LRFD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | Low limit | Up limit | |
|---|---|---|---|
| Combined Strength Ratio (CSR) | 0.3 | 1.03 | (Flexure & comp. combined) |

Design <= Press this button after input changed.

## 2. Output

MC8X21.4 <= Select a section to display

| | Comp & Flexure ASD | Comp & Flexure LRFD | Tension & Flexure ASD | Tension & Flexure LRFD | |
|---|---|---|---|---|---|
| Combined Strength Ratio | 0.90 | | 0.80 | | $(KL/r)_{max}$ = 217.65 |
| Cb = | 1.00 | | 1.01 | | |

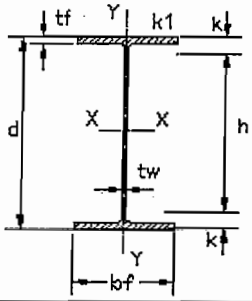
| | ASD Ratio | Stresses (ksi) Actual | Stresses (ksi) Allowable | LRFD Ratio | Strength Required | Strength Design | |
|---|---|---|---|---|---|---|---|
| Compression | 0.18 | 0.56 | 3.17 | | | 29.95 | kips |
| x-axis bending | 0.81 | 18.90 | 23.34 | | | 540.14 | in-kip |
| y-axis bending | 0.00 | 0.00 | 34.49 | | | 140.49 | in-kip |
| Tension | 0.00 | 0.00 | 21.56 | | | 203.47 | kips |
| Shear | 0.11 | 1.47 | 12.93 | | | 58.32 | kips |

| Detail Information: | | ASD | LRFD | Ref to |
|---|---|---|---|---|
| H1.1 | For Pr / Pc ≥ 0.2, Pr / Pc + 8/9 (Mrx / Mcx + Mry / Mcy) = | 0.90 | | Eq (H1-1a) |
| | For Pr / Pc < 0.2, Pr / (2Pc) + (Mrx / Mcx + Mry / Mcy) = | 0.90 | | Eq (H1-1b) |
| H1.3 | In-plane: When moment primary about x-axis = | 0.83 | | Eq (H1-1)_x |
| | When moment primary about y-axis = | 0.90 | | Eq (H1-1)_y |
| | Out-of-plane: Pr / Pco + (Mr / Mcx)² = | 0.83 | | Eq (H2-2) |
| | | Lp = | 4.25 ' | Eq (F2-5) |
| | | Lr = | 22.46 ' | Eq (F2-6) |

A ($in^2$) = 6.28
bf = 3.45 "
tf = 0.53 "
0.5 bf / tf = 0.00
For flexure, flange is Compact
Qs = 1.00
Qa = 1.00
Q=QsQa= 1.00
$r_{ts}$ = 1.18 "

Total depth, d = 8.00 "
h = 5.62 "
tw = 0.38 "
h / tw = 14.99
For flexure, web is Compact

| | x-axis | y-axis | |
|---|---|---|---|
| λ = KL/r = | 70.93 | 217.65 | |
| I = | 61.50 | 6.58 | $in^4$ |
| S = | 15.40 | 2.71 | $in^3$ |
| r = | 3.13 | 1.02 | in |



Window support beam

```
 Design Data:
     AXIAL      =   -1.00 K
     SHEAR      =    1.00 K
     X MOMENT   =   95.00 "-K
     KLX        =   30.00 FT
     KLY        =   30.00 FT
     LB         =   30.00 FT
     RT         =    0.00
     CB         =    1.00
     CMX        =    1.00
     FLANGE FY  =   55.00 KSI
     WEB FY     =   55.00 KSI
     STRESS FACTOR  1.00
     UNBRACED POINT DESIGN
     WEB DESIGNED WITH NO STIFFENERS
     AISC PLATE/YEAR = 05AISC

     SECTION
     0.2500 X  8.0 FLG   0.1345 WEB    9.00 DEPTH
     AREA   =    5.14
     IX     =   83.47    SX =  18.55    RX =   4.03    ZX =  19.93
     IY     =   21.34    SY =   5.33    RY =   2.04    ZY =   8.04
     QS     =    0.78
     QA     =    1.00
     WEIGHT =   17.50 #/FT

     FORCES
     ACTUAL P =     1.00 K          ALLOWABLE P =    24.79 K
           MX =    95.00 "-K                MX =   180.06 "-K
            V =     1.00 K                   V =    21.42 K
     COMBINED STRESS RATIO =  0.319
     SHEAR    STRESS RATIO =  0.047
```

7' HIGH WALL @ CLERESTORY. ASSUME 10 PSF DL FOR WINDOW, FRAMING, ETC.

7(10#) = 70plf, 30' SPAN ⇒ MX = 95 in-k

V = 1.1 k

• USED L/600 MAX Δ = 0.6", IREQ'D = 73.

**Deflection Load Combinations - Roof - Panel**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 1.0 S | S |

**User Applied Surface Loads (Local Coordinate System)**

| Side | Shape | Units | Type | Description | Mag | X-Loc | Y-Loc | Frm | Brc | Grt | Pur | Pnl | Supp | Dir. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | LN | plf | W | ung | 0.10 | 15/0/0 | 0/0/0 | N | N | Y | N | N | N | IN | OF |
| 4 | LN | plf | W | ung | 0.00 | 25/0/0 | 7/6/0 | N | N | Y | N | N | N | IN | OF |





## Bracing - Summary Report

### Shape: Boat Storage Building

**Loads and Codes - Shape: Boat Storage Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

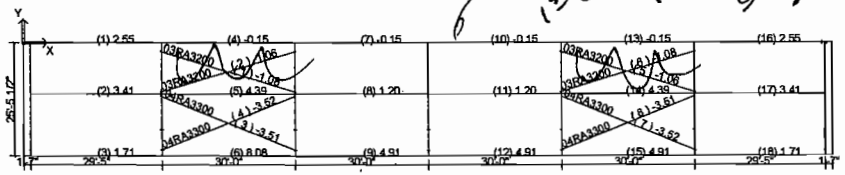
**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |

1 SI ROOF PURLIN & 1 SI CLERESTORY PURLIN SHARE RIDGE STRUT LOAD - NO BEAMS ROOF.




**Diagonal Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 31.95 | 22.7 | -1.08 | 1.0000 | 1.0000 | 0.444 | 1.0<W2 | passed | |
| 2 | R 0.375 | 31.95 | 22.7 | -1.06 | 1.0000 | 1.0000 | 0.436 | 1.0W1> | passed | |
| 3 | R 0.5 | 32.95 | 26.5 | -3.51 | 1.0000 | 1.0000 | 0.778 | 1.0<W1 | passed | |
| 4 | R 0.5 | 32.95 | 26.5 | -3.52 | 1.0000 | 1.0000 | 0.781 | 1.0W2> | passed | |
| 5 | R 0.375 | 31.95 | 22.7 | -1.06 | 1.0000 | 1.0000 | 0.436 | 1.0<W1 | passed | |
| 6 | R 0.375 | 31.95 | 22.7 | -1.08 | 1.0000 | 1.0000 | 0.444 | 1.0W2> | passed | |
| 7 | R 0.5 | 32.95 | 26.5 | -3.52 | 1.0000 | 1.0000 | 0.781 | 1.0<W2 | passed | |
| 8 | R 0.5 | 32.95 | 26.5 | -3.51 | 1.0000 | 1.0000 | 0.778 | 1.0W1> | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 3/16 in., F = 1.08k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 1.08k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 3/16 in., F = 1.06k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 1.06k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 3/16 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 3.52k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 3.52k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 5 | Left | Slot: web thk = 3/16 in., F = 1.06k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 1.06k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 6 | Left | Slot: web thk = 3/16 in., F = 1.08k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 1.08k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 7 | Left | Slot: web thk = 3/16 in., F = 3.52k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 3.52k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 8 | Left | Slot: web thk = 1/8 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 3.51k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, |



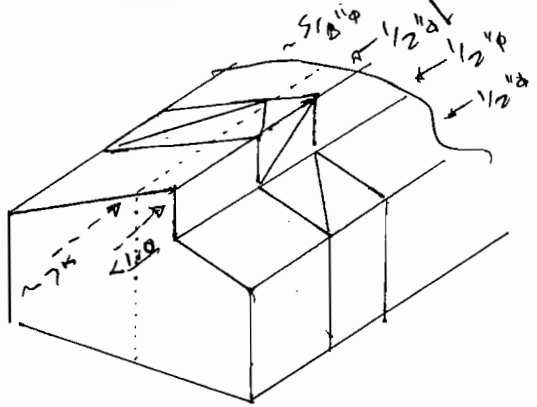


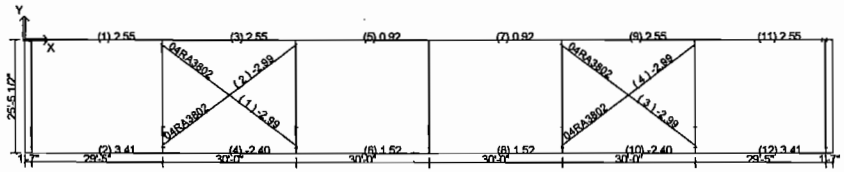
| | | web punching shear OK, tensile fracture of web OK >> passed |
|---|---|---|

**Strut Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3P 7x1/4x0.1345x8 | 29.42 | 2.55 | 1.0000 | 1.0000 | 0.172 | 1.0W2> | passed | Ridge Strut |
| 4 | 3P 8x1/4x0.1345x8 | 30.00 | -0.15 | 1.0000 | 1.0000 | 0.135 | 1.0<W1 | passed | Ridge Strut |
| 7 | 3P 8x1/4x0.1345x8 | 30.00 | -0.15 | 1.0000 | 1.0000 | 0.135 | 1.0<W1 | passed | Ridge Strut |
| 10 | 3P 8x1/4x0.1345x8 | 30.00 | -0.15 | 1.0000 | 1.0000 | 0.135 | 1.0<W1 | passed | Ridge Strut |
| 13 | 3P 8x1/4x0.1345x8 | 30.00 | -0.15 | 1.0000 | 1.0000 | 0.135 | 1.0W1> | passed | Ridge Strut |
| 16 | 3P 7x1/4x0.1345x8 | 29.42 | 2.55 | 1.0000 | 1.0000 | 0.172 | 1.0<W2 | passed | Ridge Strut |

| Mem. | End | Strut Connection Design Information |
|---|---|---|
| 1 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 4 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 7 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 10 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 13 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| 16 | Left | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |
| | Right | Frame Clip 6.00x-15.21x0.375 w/ (2) 3/4 in. A325SC, clip tensile rupture & block shear OK, clip buckling OK, clip to web weld 3/8 fillet both sides, clip to flange weld 5/16 fillet both sides => weld FAILED => FAILED <= |






Sig - Load Higher with upper Roof considered.

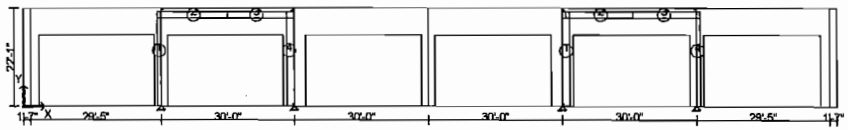
**Diagonal Bracing Member Design Summary: Roof B**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.5 | 38.16 | 41.4 | -2.99 | 1.0000 | 1.0000 | 0.664 | 1.0W2> | passed | |
| 2 | R 0.5 | 38.16 | 41.4 | -2.99 | 1.0000 | 1.0000 | 0.663 | 1.0<W1 | passed | |
| 3 | R 0.5 | 38.16 | 41.4 | -2.99 | 1.0000 | 1.0000 | 0.663 | 1.0W1> | passed | |
| 4 | R 0.5 | 38.16 | 41.4 | -2.99 | 1.0000 | 1.0000 | 0.664 | 1.0<W2 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 3/16 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 3/16 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 3/16 in., F = 2.99k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |



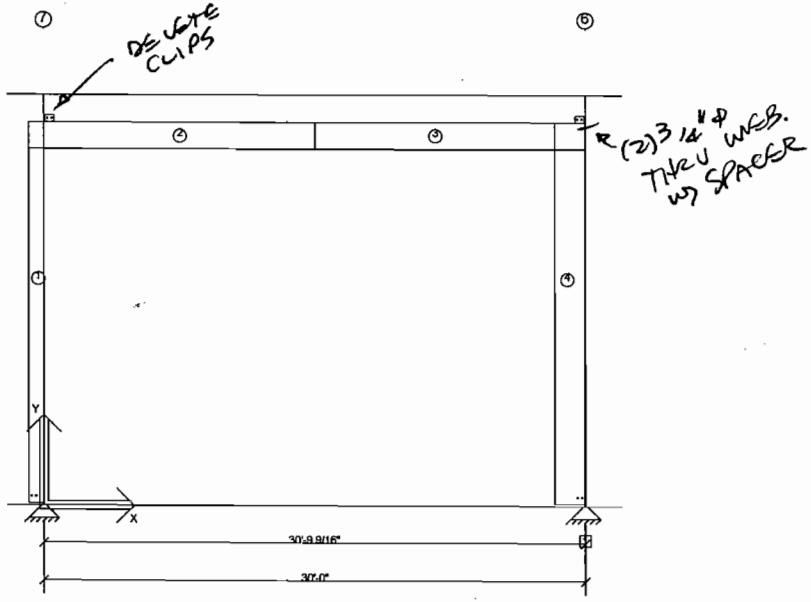





| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | FLUSH CONNECTION >> HAND DESIGN REQUIRED |
| Left Main | Haunch: MZE weld stress OK, Base: MZE weld stress OK |
| Right Portal | FLUSH CONNECTION >> HAND DESIGN REQUIRED |
| Right Main | Haunch: MZE weld stress OK, Base: MZE weld stress OK |

Frame Cross Section: A

OK
DAVE




**Dimension Key**
1 1/2"
2 1'-6 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX318) and 4(CX319): 28'-3 9/16"
Vert. Clearance at member 1(CX318): 19'-8 9/16"
Vert. Clearance at member 4(CX319): 19'-8 9/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.00 | 0.3750 | 0.1644 | 10.00 | 10.00 | 21.13 | 548.6 | 55.00 | 55.00 | SS | KN | 3P |
| 2 | 8.00 | 0.2500 | 0.1644 | 18.00 | 18.00 | 15.84 | 366.2 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 8.00 | 0.3750 | 0.1644 | 18.00 | 18.00 | 14.96 | 419.6 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 8.00 | 0.5000 | 0.1644 | 20.00 | 20.00 | 21.13 | 811.7 | 55.00 | 55.00 | SS | KN | 3P |

Total Frame Weight = 2146.1 (p) (Includes all plates)
Frame Pricing Weight = 2179.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 30/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 2.1 | 0.0 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 4.2 | 0.0 | 0.0 | 0.0 |
| <WB1 | 4.2 | 0.0 | 0.0 | 0.0 |
| WB2> | 4.2 | 0.0 | 0.0 | 0.0 |
| <WB2 | 4.2 | 0.0 | 0.0 | 0.0 |
| EB> | 1.4 | 0.0 | 0.0 | 0.0 |
| <EB | 1.4 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 19.63 | 9.250 | N/A | N/A | N/A | 0.3125 | 3.500 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 18.95 | 19.000 | N/A | N/A | N/A | 0.3750 | 3.500 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.500 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 12 | Flush | 2.00 |
| 4 | 2 | KN(Face) | 0.500 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 12 | Flush | 2.00 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | | |
| 1 | 2 | 37 | -1.4 | 3.4 | 335.3 | Thin plate | 106.0 | 377.0 | 42 | -3.2 | 2.8 | 336.4 | Thin plate | 106.0 | 377.0 | | |
| 2 | 1 | 37 | -1.4 | 3.4 | 335.3 | Thin plate | 106.0 | 377.0 | 42 | -3.2 | 2.8 | 336.4 | Thin plate | 106.0 | 377.0 | | |
| 3 | 2 | 41 | -3.2 | 3.4 | 686.0 | Thin plate | 159.0 | 822.4 | 38 | -1.4 | 2.8 | 688.1 | Thin plate | 159.0 | 822.4 | | |
| 4 | 2 | 41 | -3.2 | 3.4 | 686.0 | Thin plate | 159.0 | 822.4 | 38 | -1.4 | 2.8 | 688.1 | Thin plate | 159.0 | 822.4 | | |





**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases: Axial + Flexure | Controlling Cases: Shear | Required Strength: Axial Pr k | Required Strength: Shear Vr k | Required Strength: Mom-x Mrx in-k | Required Strength: Mom-y Mry in-k | Available Strength: Axial Pc k | Available Strength: Shear Vc k | Available Strength: Mom-x Mcx in-k | Available Strength: Mom-y Mcy in-k | Strength Ratios: Axial + Flexure | Strength Ratios: Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.63 | 10.00 | 37 | 37 | -3.9 | -1.4 | -339.7 | 0.0 | 190.7 | 32.6 | 998.1 | 357.9 | 0.35 | 0.04 |
| 2 | 0.42 | 18.00 | 42 | 37 | -3.2 | 3.4 | 336.4 | 0.0 | 115.1 | 20.6 | 1013.3 | 127.8 | 0.35 | 0.16 |
| 3 | 13.29 | 18.00 | 37 | 41 | -1.4 | -3.4 | 686.6 | 0.0 | 41.8 | 21.2 | 1101.2 | 344.7 | 0.42 | 0.16 |
| 4 | 19.63 | 20.00 | 38 | 41 | 2.3 | 3.0 | 653.0 | 0.0 | 345.6 | 19.4 | 2535.1 | 532.2 | 0.26 | 0.15 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.63 | 235.56 | 235.6 | 235.6 | 7.52 | 7.52 | 149.87 | 32.00 | 29.97 | 8.00 | 32.39 | 12.06 | 0.30 | 741.20 | 1.65 | 1.00 | 1.08 | 1.00 | 0.95 |
| 2 | 0.42 | 339.56 | 14.0 | 14.0 | 6.88 | 6.88 | 388.51 | 21.34 | 43.17 | 5.33 | 48.09 | 8.12 | 0.11 | 1680.84 | 1.00 | 1.00 | 1.06 | 0.69 | 0.81 |
| 3 | 13.29 | 339.56 | 339.6 | 339.6 | 8.84 | 8.84 | 536.35 | 32.01 | 59.59 | 8.00 | 65.10 | 12.12 | 0.31 | 2485.62 | 2.10 | 1.00 | 1.05 | 0.93 | 0.97 |
| 4 | 19.63 | 235.56 | 235.6 | 235.6 | 11.12 | 11.12 | 854.63 | 42.67 | 85.46 | 10.67 | 92.84 | 16.13 | 0.70 | 4056.67 | 1.67 | 1.00 | 1.03 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: A**

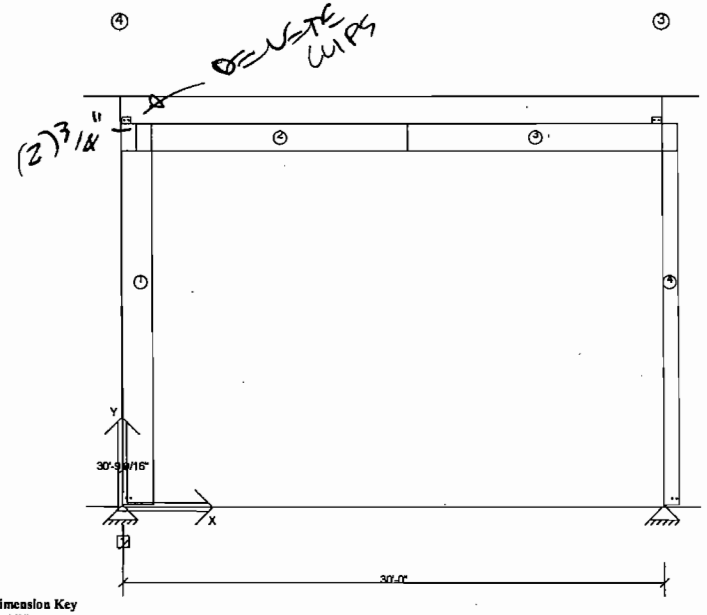
| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/220 ) | -1.109 | 4 | 2 | 21 | WB2> |
| Max. Vertical Deflection for Span 1 | ( L/2444 ) | -0.145 | 3 | 1 | 12 | WB2> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | FLUSH CONNECTION >> HAND DESIGN REQUIRED |
| Left Main | Haunch: MZE weld stress OK, Base: MZE weld stress OK |
| Right Portal | FLUSH CONNECTION >> HAND DESIGN REQUIRED |
| Right Main | Haunch: MZE weld stress OK, Base: MZE weld stress OK |

Frame Cross Section: A




**Dimension Key**
1 1/2"
2 1'-6 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX320) and 4(CX318): 28'-3 9/16"
Vert. Clearance at member 1(CX320): 19'-8 9/16"
Vert. Clearance at member 4(CX318): 19'-8 9/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.00 | 0.5000 | 0.1644 | 20.00 | 20.00 | 21.13 | 811.7 | 55.00 | 55.00 | SS | KN | 3P |
| 2 | 8.00 | 0.3750 | 0.1644 | 18.00 | 18.00 | 15.84 | 446.0 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 8.00 | 0.2500 | 0.1644 | 18.00 | 18.00 | 14.96 | 345.6 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 8.00 | 0.3750 | 0.1644 | 10.00 | 10.00 | 21.13 | 548.6 | 55.00 | 55.00 | SS | KN | 3P |

Total Frame Weight = 2151.9 (p) (Includes all plates)
Frame Pricing Weight = 2188.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 30/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal Load (k) | Horizontal Reaction (k) | Vertical Load (k) | Vertical Reaction (k) |
|---|---|---|---|---|
| D | 0.0 | 0.0 | 2.1 | 0.0 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 4.8 | 0.0 | 0.0 | 0.0 |
| <WB1 | 4.8 | 0.0 | 0.0 | 0.0 |
| WB2> | 4.8 | 0.0 | 0.0 | 0.0 |
| <WB2 | 4.8 | 0.0 | 0.0 | 0.0 |
| EB> | 1.6 | 0.0 | 0.0 | 0.0 |
| <EB | 1.6 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 18.95 | 19.000 | N/A | N/A | N/A | 0.3750 | 3.500 | Both | F-FP,W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1875 | 0.1875 | 3.500 | Opposite Fillet | W-OS-0.1875 |
| 4 | 1 | S3 | 19.63 | 9.250 | N/A | N/A | N/A | 0.3125 | 3.500 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Outside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 12 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.500 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 12 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 4 | 2 | KN(Face) | 0.375 | 8.00 | 19.00 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |

| Mem. No. | Jt. No. | Required Strength - Out Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - Out Design Proc. | Shear (k) | Moment (in-k) | Required Strength - In Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - In Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 37 | -3.0 | 3.8 | 788.1 | Thin plate | 159.0 | 835.3 | 42 | -1.6 | 3.2 | 790.1 | Thin plate | 159.0 | 835.3 |
| 2 | 1 | 37 | -3.0 | 3.8 | 788.1 | Thin plate | 159.0 | 835.3 | 42 | -1.6 | 3.2 | 790.1 | Thin plate | 159.0 | 835.3 |
| 3 | 2 | 41 | -1.6 | 3.8 | 381.3 | Thin plate | 106.0 | 377.4 | 38 | 1.5 | 3.2 | 342.0 | Thin plate | 106.0 | 377.4 |





| 4 | 2 | 41 | -1.6 | 3.8 | 381.3 | Thin plate | 106.0 | 377.4 | 38 | 1.5 | 3.2 | 342.0 | Thin plate | 106.0 | 377.4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.63 | 20.00 | 42 | 37 | 2.8 | -3.4 | 750.1 | 0.0 | 345.6 | 19.4 | 2539.3 | 532.2 | 0.30 | 0.17 |
| 2 | 0.83 | 18.00 | 41 | 37 | -1.6 | 3.8 | 788.9 | 0.0 | 41.8 | 21.2 | 1104.7 | 344.7 | 0.55 | 0.18 |
| 3 | 14.13 | 18.00 | 38 | 41 | 1.5 | -3.8 | 342.0 | 0.0 | 218.8 | 20.6 | 722.6 | 127.8 | 0.48 | 0.18 |
| 4 | 19.63 | 10.00 | 41 | 41 | -4.3 | 1.6 | -386.3 | 0.0 | 190.7 | 32.6 | 998.1 | 357.9 | 0.40 | 0.05 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.63 | 235.56 | 235.6 | 235.6 | 11.12 | 11.12 | 854.63 | 42.67 | 85.46 | 10.67 | 92.84 | 16.13 | 0.70 | 4056.67 | 1.67 | 1.00 | 1.03 | 1.00 | 1.00 |
| 2 | 0.83 | 339.56 | 19.0 | 19.0 | 8.84 | 8.84 | 536.35 | 32.01 | 59.59 | 8.00 | 65.10 | 12.12 | 0.31 | 2485.62 | 1.00 | 1.00 | 1.05 | 0.93 | 0.97 |
| 3 | 14.13 | 339.56 | 339.6 | 339.6 | 6.88 | 6.88 | 388.51 | 21.34 | 43.17 | 5.33 | 48.09 | 8.12 | 0.11 | 1680.84 | 2.21 | 1.00 | 1.06 | 0.69 | 1.00 |
| 4 | 19.63 | 235.56 | 235.6 | 235.6 | 7.52 | 7.52 | 149.87 | 32.00 | 29.97 | 8.00 | 32.39 | 12.06 | 0.30 | 741.20 | 1.65 | 1.00 | 1.08 | 1.00 | 0.95 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: A**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/192 ) | 1.269 | 1 | 2 | 22 | <WB2 |
| Max. Vertical Deflection for Span 1 | ( L/2278 ) | -0.156 | 2 | 2 | 13 | <WB2 |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

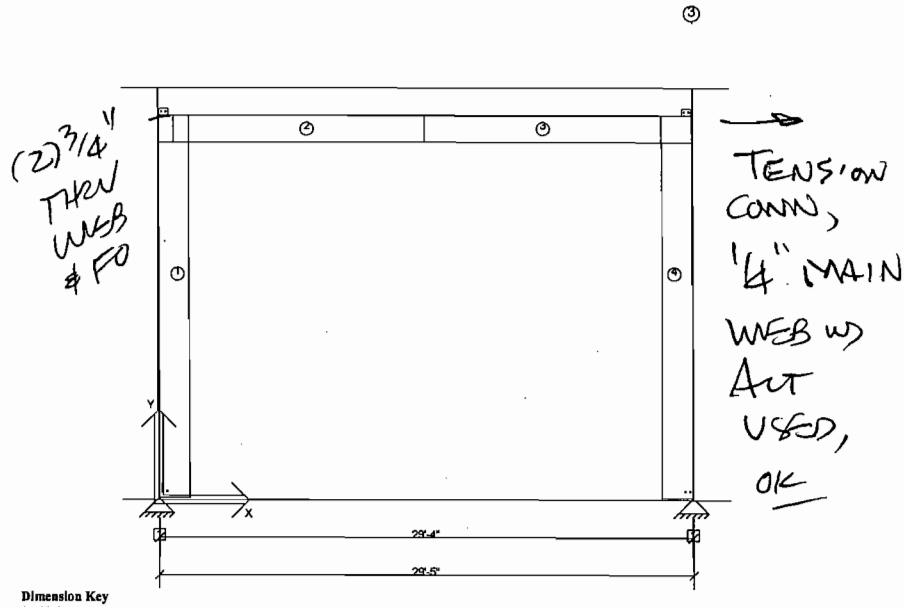



| Location | Portal Frame to Main Frame Connection Design Information |
|---|---|
| Left Portal | FLUSH CONNECTION >> HAND DESIGN REQUIRED |
| Left Main | Haunch: MZE weld stress OK, Base: MZE weld stress OK |
| Right Portal | FLUSH CONNECTION >> HAND DESIGN REQUIRED |
| Right Main | Haunch: MZE weld stress OK, Base: MZE weld stress OK |

Frame Cross Section: D








**Dimension Key**
1 1/2"
2 1'-6 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX321) and 4(CX322): 26'-0"
Vert. Clearance at member 1(CX321): 19'-6 3/16"
Vert. Clearance at member 4(CX322): 19'-6 3/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 0/0/0 | 0/0/0 | Portal Frame | 0.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10.00 | 0.3750 | 0.1644 | 20.00 | 20.00 | 21.13 | 767.9 | 55.00 | 55.00 | SS | KN | 3P |
| 2 | 10.00 | 0.3750 | 0.1345 | 18.00 | 18.00 | 14.67 | 447.5 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 10.00 | 0.3750 | 0.1345 | 18.00 | 18.00 | 14.67 | 447.5 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 10.00 | 0.3750 | 0.1345 | 20.00 | 20.00 | 21.13 | 750.3 | 55.00 | 55.00 | SS | KN | 3P |





Total Frame Weight = 2413.1 (p) (Includes all plates)
Frame Pricing Weight = 2474.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 29/5/0 | 0/1/8 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal Load (k) | Horizontal Reaction (k) | Vertical Load (k) | Vertical Reaction (k) |
|---|---|---|---|---|
| D | 0.0 | 0.0 | 2.4 | 0.0 |
| CG | 0.0 | 0.0 | 0.0 | 0.0 |
| L> | 0.0 | 0.0 | 0.0 | 0.0 |
| <L | 0.0 | 0.0 | 0.0 | 0.0 |
| S> | 0.0 | 0.0 | 0.0 | 0.0 |
| <S | 0.0 | 0.0 | 0.0 | 0.0 |
| US1* | 0.0 | 0.0 | 0.0 | 0.0 |
| *US1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W1> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W1 | 0.0 | 0.0 | 0.0 | 0.0 |
| W2> | 0.0 | 0.0 | 0.0 | 0.0 |
| <W2 | 0.0 | 0.0 | 0.0 | 0.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 0.0 | 0.0 |
| S | 0.0 | 0.0 | 0.0 | 0.0 |
| E> | 0.0 | 0.0 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.0 | 0.0 |
| <E | 0.0 | 0.0 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.0 | 0.0 |
| WP | 0.0 | 0.0 | 0.0 | 0.0 |
| WB1> | 8.6 | 0.0 | 0.0 | 0.0 |
| <WB1 | 8.6 | 0.0 | 0.0 | 0.0 |
| WB2> | 8.6 | 0.0 | 0.0 | 0.0 |
| <WB2 | 8.6 | 0.0 | 0.0 | 0.0 |
| EB> | 3.3 | 0.0 | 0.0 | 0.0 |
| <EB | 3.3 | 0.0 | 0.0 | 0.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 18.95 | 19.250 | N/A | N/A | N/A | 0.3750 | 4.500 | Both | F-FP,W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1875 | 0.1875 | 4.500 | Opposite Fillet | W-BS-0.1875 |
| 4 | 1 | S3 | 18.95 | 19.250 | N/A | N/A | N/A | 0.3750 | 4.500 | Both | F-FP,W-OS-0.1875 |
| 4 | *** | MUST | Use | Alternate | Web | Thick.= | 0.2500 | * | * | * | * |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Bolt Spec/Joint | Bolt Gages In/Out (in.) | Outside Flange Configuration ID | Outside Flange Configuration Desc. | Outside Flange Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Inside Flange Configuration Desc. | Inside Flange Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | KN(Face) | 0.750 | 10.00 | 21.38 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 71 | Extended | 15.56 |
| 2 | 1 | KN(Face) | 0.750 | 10.00 | 21.38 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 71 | Extended | 15.56 |
| 3 | 2 | KN(Face) | 0.750 | 10.00 | 21.38 | 0.750 | A325X/ST | 3.00/3.00 | | Flush | 14.06 | 31 | Extended | 3.50 |
| 4 | 2 | KN(Face) | 0.750 | 10.00 | 21.38 | 0.750 | A325X/ST | 3.00 | 12 | Flush | 2.00 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - Out Design Proc. | Shear (k) | Moment (in-k) | Required Strength - In Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - In Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 45 | -4.4 | 7.0 | 1032.4 | Thick plate | 318.1 | 1177.9 | 42 | 4.5 | 6.3 | 1008.2 | Thick plate | 318.1 | 1401.6 |
| 2 | 1 | 46 | -4.4 | 7.0 | 1032.4 | Thick plate | 318.1 | 1177.9 | 43 | 4.5 | 6.3 | 1008.2 | Thick plate | 318.1 | 1401.6 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 2 | 33 | 4.4 | 7.0 | 1048.7 | Thick plate | 318.1 | 1177.9 | 34 | 4.4 | 7.0 | 1048.7 | Thick plate | 318.1 | 1401.6 |
| 4 | 2 | 32 | 4.4 | 7.0 | 1048.7 | Thick plate | 318.1 | 1177.9 | 33 | 4.4 | 7.0 | 1048.7 | Thick plate | 318.1 | 1401.6 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 19.63 | 20.00 | 33 | 33 | -7.7 | -4.5 | -1062.5 | 0.0 | 224.1 | 18.9 | 2205.7 | 406.9 | 0.50 | 0.24 |
| 2 | 0.83 | 18.00 | 33 | 33 | -4.4 | 7.0 | -1032.4 | 0.0 | 200.6 | 11.6 | 1870.8 | 395.0 | 0.56 | 0.60 |
| 3 | 13.00 | 18.00 | 29 | 29 | 4.4 | -7.0 | -1048.7 | 0.0 | 310.9 | 11.6 | 1870.8 | 395.0 | 0.57 | 0.60 |
| 4 | 19.63 | 20.00 | 29 | 29 | -7.7 | 4.3 | -1004.2 | 0.0 | 208.8 | 10.4 | 2101.0 | 392.7 | 0.50 | 0.41 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19.63 | 235.58 | 235.6 | 235.6 | 10.66 | 10.66 | 819.95 | 62.51 | 82.00 | 12.50 | 88.82 | 18.88 | 0.38 | 6018.51 | 1.66 | 1.00 | 1.03 | 0.79 | 0.83 |
| 2 | 0.83 | 312.00 | 19.0 | 19.0 | 9.82 | 9.82 | 640.07 | 62.50 | 71.12 | 12.50 | 76.10 | 18.83 | 0.37 | 4854.03 | 1.00 | 1.00 | 1.00 | 0.78 | 0.86 |
| 3 | 13.00 | 312.00 | 312.0 | 312.0 | 9.82 | 9.82 | 640.07 | 62.50 | 71.12 | 12.50 | 76.10 | 18.83 | 0.37 | 4854.03 | 2.28 | 1.00 | 1.00 | 0.78 | 1.00 |
| 4 | 19.63 | 235.58 | 235.6 | 235.6 | 10.09 | 10.09 | 802.18 | 62.50 | 80.22 | 12.50 | 86.05 | 18.84 | 0.37 | 6018.20 | 1.66 | 1.00 | 1.00 | 0.78 | 0.84 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: D**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/206 ) | -1.184 | 4 | 2 | 20 | <WB1 |
| Max. Vertical Deflection for Span 1 | ( L/77792 ) | -0.004 | 2 | 2 | 11 | <WB1 |

-* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Shape: Clerestory A**
**Loads and Codes - Shape: Clerestory A**
**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code **Built Up:** 05AISC - ASD **Rainfall:** 10.00 inches per hour
Building Use: Standard Occupancy Structure **Cold Form:** 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.741)
Parts Wind Exposure Factor: 0.741
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 30/0/0
Primary Zone Strip Width: 18/2/12
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 27.24 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

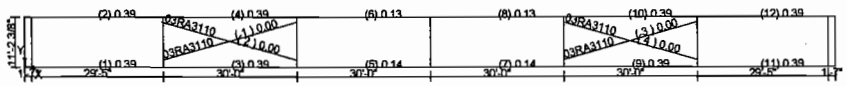
**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4973
Bracing Seismic Period: 0.2968
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Bracing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W1 | <W1 |
| 3 | System | 1.000 | 1.0 W2> | W2> |
| 4 | System | 1.000 | 1.0 <W2 | <W2 |
| 5 | System | 1.000 | 0.700 E> | E> |
| 6 | System | 1.000 | 0.700 <E | <E |




**Diagonal Bracing Member Design Summary: Roof A**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 31.78 | 18.8 | 0.00 | 1.0000 | 1.0000 | 0.002 | 1.0W2> | passed | |
| 2 | R 0.375 | 31.78 | 18.8 | 0.00 | 1.0000 | 1.0000 | 0.001 | 1.0<W2 | passed | |
| 3 | R 0.375 | 31.78 | 18.8 | 0.00 | 1.0000 | 1.0000 | 0.001 | 1.0W2> | passed | |
| 4 | R 0.375 | 31.78 | 18.8 | 0.00 | 1.0000 | 1.0000 | 0.002 | 1.0<W2 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.00k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |



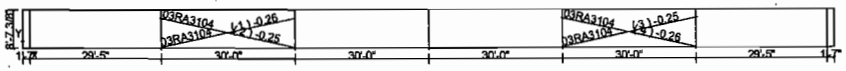





**Diagonal Bracing Member Design Summary: Sidewall 2**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 30.67 | 6.3 | -0.26 | 1.0000 | 1.0000 | 0.108 | 1.0<W2 | passed | |
| 2 | R 0.375 | 30.67 | 6.3 | -0.25 | 1.0000 | 1.0000 | 0.104 | 1.0W1> | passed | |
| 3 | R 0.375 | 30.67 | 6.3 | -0.25 | 1.0000 | 1.0000 | 0.104 | 1.0<W1 | passed | |
| 4 | R 0.375 | 30.67 | 6.3 | -0.26 | 1.0000 | 1.0000 | 0.108 | 1.0W2> | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |




1/2"ϕ

**Diagonal Bracing Member Design Summary: Sidewall 4**

| Mem. No. | Bracing Shape | Length (ft) | Angle | Design Axial (k) | Seismic Factor | Stress Factor | Stress Ratio | Governing Load Case | Design Status | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R 0.375 | 31.33 | 16.6 | -0.26 | 1.0000 | 1.0000 | 0.108 | 1.0W2> | passed | |
| 2 | R 0.375 | 31.33 | 16.6 | -0.25 | 1.0000 | 1.0000 | 0.104 | 1.0<W1 | passed | |
| 3 | R 0.375 | 31.33 | 16.6 | -0.25 | 1.0000 | 1.0000 | 0.104 | 1.0W1> | passed | |
| 4 | R 0.375 | 31.33 | 16.6 | -0.26 | 1.0000 | 1.0000 | 0.108 | 1.0<W2 | passed | |

| Mem. | End | Diagonal Connection Design Information |
|---|---|---|
| 1 | Left | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 2 | Left | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 3 | Left | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.25k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| 4 | Left | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |
| | Right | Slot: web thk = 1/8 in., F = 0.26k, E factor = 1.000, stress increase = 1.000, slot offset = 2 in., web/flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK >> passed |





**Secondary - Summary Report**

**Loads and Codes - Shape: Boat Storage Building**

City: Stennis Space Center County: Hancock State: Mississippi Country: United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 8) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 8) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 19 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |

| | | | | |
|---|---|---|---|---|
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 CG + 1.0 W1> | CG + W1> |
| 2 | System | 1.000 | 1.0 CG + 1.0 <W2 | CG + <W2 |
| 3 | System | 1.000 | 1.0 CG + 1.0 WP | CG + WP |
| 4 | System | 1.000 | 1.0 CG + 0.700 E> | CG + E> |
| 5 | System | 1.000 | 1.0 CG + 0.700 <E | CG + <E |

**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 240 | 1.0 L | L |

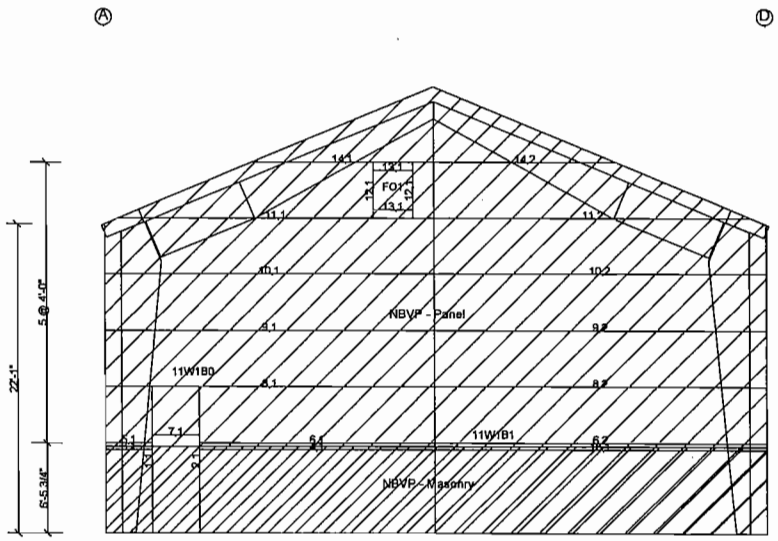
**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 0.500 <E | <E |





**Wall: 1**




**Dimension Key**
1 3'-4"
2 3'-4 1/2"
3 2'-9 3/4"
4 1'-6"
5 7 1/8"

**Maximum Secondary Designs for Shape Boat Storage Building on Side 1**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 10.48 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.28 | 0.19 | 0.34 | 0.00 | 1 | | | | | | |
| 2,1 | 10.48 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.71 | 0.36 | 0.80 | 0.00 | 1 | | | | | | |
| 5,1 | 3.33 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 6,1 | 16.79 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.57 | 0.29 | 0.64 | 0.00 | 1 | 0.35 | 0.16 | 0.39 | 0.00 | 1 | 12 |
| 6,2 | 23.50 | 8.50x0.059 Z Con | Yes | 36 | 0.35 | 0.19 | 0.40 | 0.00 | 1 | 12 | 0.72 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 7,1 | 3.38 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.02 | 0.00 | 1 | | | | | | |
| 8,1 | 23.50 | 8.50x0.082 Z Con | Yes | 36 | | | | | | | 1.02 | 0.12 | 1.02 | 0.00 | 1 | 0.67 | 0.20 | 0.70 | 0.00 | 1 | 36 |
| 8,2 | 23.50 | 8.50x0.073 Z Con | Yes | 36 | 0.67 | 0.16 | 0.69 | 0.00 | 1 | 36 | 0.83 | 0.32 | 0.89 | 0.00 | 1 | | | | | | |
| 9,1 | 23.50 | 8.50x0.065 Z Con | Yes | 24 | | | | | | | 0.87 | 0.45 | 0.98 | 0.00 | 1 | 0.68 | 0.26 | 0.73 | 0.00 | 1 | 24 |
| 9,2 | 23.50 | 8.50x0.065 Z Con | Yes | 36 | 0.68 | 0.26 | 0.73 | 0.00 | 1 | 24 | 0.87 | 0.45 | 0.98 | 0.00 | 1 | | | | | | |
| 10,1 | 23.50 | 8.50x0.065 Z Con | Yes | 24 | | | | | | | 0.89 | 0.47 | 1.00 | 0.00 | 1 | 0.70 | 0.27 | 0.75 | 0.00 | 1 | 24 |
| 10,2 | 23.50 | 8.50x0.065 Z Con | Yes | 36 | 0.70 | 0.26 | 0.75 | 0.00 | 1 | 24 | 0.90 | 0.46 | 1.01 | 0.00 | 1 | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11,1 | 22.55 | 8.50x0.059 Z Con | Yes | 36 | | | | | | | 0.94 | 0.00 | 0.00 | 0.00 | 1 | 0.78 | 0.35 | 0.86 | 0.00 | 1 | 36 |
| 11,2 | 22.55 | 8.50x0.059 Z Con | Yes | 36 | 0.78 | 0.34 | 0.85 | 0.00 | 1 | 36 | 0.72 | 0.54 | 0.90 | 0.00 | 1 | | | | | | |
| 12,1 | 4.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.01 | 0.03 | 0.03 | 0.00 | 1 | | | | | | |
| 13,1 | 2.81 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 14,1 | 12.95 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.30 | 0.34 | 0.45 | 0.00 | 1 | 0.23 | 0.20 | 0.31 | 0.00 | 1 | 12 |
| 14,2 | 12.95 | 8.50x0.059 Z Con | Yes | 12 | 0.23 | 0.20 | 0.31 | 0.00 | 1 | 12 | 0.30 | 0.33 | 0.45 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 1**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.08 | ( L/1494 ) | 5.50 | 1 | W1> |
| 2 | 1 | 0.18 | ( L/695 ) | 5.50 | 1 | W1> |
| 5 | 1 | - | - | - | - | - |
| 6 | 1 | -0.05 | ( L/4296 ) | 14.00 | 1 | W1> |
| 6 | 2 | 0.56 | ( L/508 ) | 29.79 | 1 | W1> |
| 7 | 1 | - | - | - | - | - |
| 8 | 1 | 1.12 | ( L/253 ) | 9.50 | 1 | W1> |
| 8 | 2 | 0.32 | ( L/882 ) | 39.00 | 1 | W1> |
| 9 | 1 | 0.64 | ( L/440 ) | 9.50 | 1 | W1> |
| 9 | 2 | 0.65 | ( L/431 ) | 37.50 | 1 | W1> |
| 10 | 1 | 0.70 | ( L/402 ) | 9.50 | 1 | W1> |
| 10 | 2 | 0.63 | ( L/445 ) | 37.50 | 1 | W1> |
| 11 | 1 | 0.56 | ( L/480 ) | 9.00 | 1 | W1> |
| 11 | 2 | 0.54 | ( L/504 ) | 36.05 | 1 | W1> |
| 12 | 1 | - | - | - | - | - |
| 13 | 1 | - | - | - | - | - |
| 14 | 1 | 0.06 | ( L/2650 ) | 5.50 | 1 | W1> |
| 14 | 2 | 0.06 | ( L/2685 ) | 20.45 | 1 | W1> |





**Spandrel channel(Id=3,1) : CH 6 x 8.20**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 0.53 | 8.2 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 8.2 (p) (Includes all plates)
Frame Pricing Weight = 9.0 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. Id | Jt. No. | Type | Thick. in. | Height in. | Length in. | Fy ksi | Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | 'a' in. | Size in. | Side | C in. | Depth in. |
| 3,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |
| 3,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 3,1 | 1 | 1 | 0.00 | -0.22 | 0.00 | 0.22 | 0.0 | 1.03 | 0.02 | 0.02 | 0.01 | 0.38 | OK->ClipLocalBuckling | 0.0032 | 0.1875 |
| 3,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0<br>3/4/0 | 0/0/0<br>0/0/0 | Yes<br>No | Yes<br>Yes | No<br>No | 0/0/0<br>0/0/0 | 0/0/0<br>0/0/0 | 0.0000<br>0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.67 | 6.00 | 1 | 1 | 0.0 | 0.2 | -2.2 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.67 | 40.00 | 40.0 | 40.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

* TOP OF BLOCK, AVG CHRGS = 9 X 13.4
FOR CONSISTENCY.

**Spandral channel(Id=4,1) : CH 6 x 8.20**

9X13.4

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 8.40 | 72.7 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 8.38 | 68.7 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 141.3 (p) (Includes all plates)
Frame Pricing Weight = 142.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 4,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 4,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 4,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 4,1 | 2 | 1 | 0.00 | -0.78 | 0.00 | 0.78 | 0.0 | 1.03 | 0.06 | 0.06 | 0.05 | 0.32 | OK->ClipLocalBuckling | 0.0115 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 16/9/8 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 8.40 | 6.00 | 1 | 1 | 0.0 | -0.8 | -39.1 | 0.0 | 51.6 | 17.3 | 42.0 | 21.3 | 0.93 | 0.04 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | 0.8 | -39.1 | 0.0 | 51.6 | 17.3 | 42.0 | 21.3 | 0.93 | 0.04 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.40 | 201.50 | 201.5 | 201.5 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 201.50 | 201.5 | 201.5 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=4,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/661 ) | 0.305 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandral channel(Id=15,1) : CH 9 x 13.40**

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.43 | 0.4130 | 0.2330 | 9.00 | 9.00 | 11.73 | 157.2 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.43 | 0.4130 | 0.2330 | 9.00 | 9.00 | 8.95 | 119.9 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 277.1 (p) (Includes all plates)
Frame Pricing Weight = 277.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 15,1 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 15,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 15,1 | 1 | 1 | 0.00 | -1.04 | 0.00 | 1.04 | 0.0 | 1.03 | 0.08 | 0.07 | 0.04 | 0.32 | OK->ClipLocalBuckling | 0.0155 | 0.1875 |
| 15,1 | 2 | 1 | 0.00 | -1.06 | 0.00 | 1.06 | 0.0 | 1.03 | 0.08 | 0.07 | 0.04 | 0.38 | OK->ClipLocalBuckling | 0.0158 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 23/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.75 | 9.00 | 1 | 1 | 0.0 | -1.0 | -73.4 | 0.0 | 85.1 | 30.2 | 72.4 | 41.9 | 1.01 | 0.03 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 1.1 | -73.4 | 0.0 | 85.1 | 30.2 | 72.4 | 41.9 | 1.01 | 0.04 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.75 | 282.00 | 282.0 | 282.0 | 3.94 | 3.94 | 47.80 | 1.75 | 10.60 | 0.95 | 12.60 | 1.94 | 0.15 | 32.26 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 282.00 | 282.0 | 282.0 | 3.94 | 3.94 | 47.80 | 1.75 | 10.60 | 0.95 | 12.60 | 1.94 | 0.15 | 32.26 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

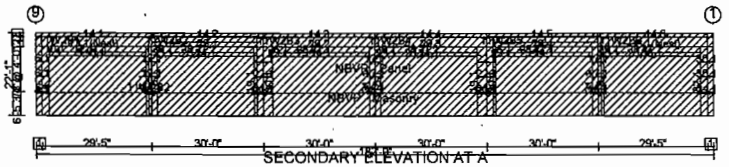
**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=15,1) : CH 9 x 13.40**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/916 ) | 0.308 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2**




**Dimension Key**
1 1'-7"
2 2'-6 9/16"
3 1'-0 11/16"
4 3'-6"
5 1'-6"
6 2'-6"
7 1'-0"

**Maximum Secondary Designs for Shape Boat Storage Building on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.06 | 0.07 | 0.00 | 1 | | | | | | |
| 6,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.11 | 0.11 | 0.00 | 1 | | | | | | |
| 8,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 11,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 13,1 | 31.00 | 8.50x0.092 Z Con Nest | Yes | 0 | | | | | | | 0.77 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 14,1 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.84 | 0.00 | 0.00 | 0.00 | 1 | 0.44 | 0.18 | 0.48 | 0.00 | 1 | 12 |
| 14,2 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.44 | 0.16 | 0.47 | 0.00 | 1 | 12 | 0.74 | 0.30 | 0.80 | 0.00 | 1 | 0.33 | 0.14 | 0.36 | 0.00 | 1 | 12 |
| 14,3 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.33 | 0.15 | 0.36 | 0.00 | 1 | 12 | 0.60 | 0.29 | 0.67 | 0.00 | 1 | 0.37 | 0.15 | 0.40 | 0.00 | 1 | 12 |
| 14,4 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.37 | 0.15 | 0.40 | 0.00 | 1 | 12 | 0.60 | 0.29 | 0.67 | 0.00 | 1 | 0.33 | 0.15 | 0.36 | 0.00 | 1 | 12 |
| 14,5 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.33 | 0.14 | 0.36 | 0.00 | 1 | 12 | 0.74 | 0.30 | 0.80 | 0.00 | 1 | 0.44 | 0.16 | 0.47 | 0.00 | 1 | 12 |
| 14,6 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | 0.44 | 0.18 | 0.48 | 0.00 | 1 | 12 | 0.84 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 16,1 | 3.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.00 | 0.03 | 0.03 | 0.00 | 1 | | | | | | |
| 17,1 | 3.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.01 | 0.05 | 0.05 | 0.00 | 1 | | | | | | |
| 21,1 | 5.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.01 | 0.05 | 0.05 | 0.00 | 1 | | | | | | |
| 22,1 | 5.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.08 | 0.09 | 0.00 | 1 | | | | | | |
| 24,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 27,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 29,1 | 30.00 | 8.50x0.120 Z Con | Yes | 36 | | | | | | | 0.64 | 0.33 | 0.72 | 0.00 | 1 | 0.96 | 0.25 | 0.99 | 0.00 | 1 | 36 |
| 29,2 | 30.00 | 8.50x0.065 Z Con | Yes | 36 | 0.96 | 0.33 | 1.01 | 0.00 | 1 | 36 | 0.45 | 0.00 | 0.32 | 0.00 | 1 | 0.57 | 0.34 | 0.67 | 0.00 | 1 | 36 |
| 29,3 | 30.00 | 8.50x0.092 Z Con | Yes | 36 | 0.57 | 0.49 | 0.76 | 0.00 | 1 | 36 | 0.84 | 0.10 | 0.65 | 0.00 | 2 | 0.92 | 0.25 | 0.96 | 0.00 | 1 | 36 |
| 29,4 | 30.00 | 8.50x0.092 Z Con | Yes | 36 | 0.92 | 0.38 | 1.00 | 0.00 | 1 | 36 | 0.73 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 34,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.06 | 0.07 | 0.00 | 1 | | | | | | |
| 35,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.11 | 0.11 | 0.00 | 1 | | | | | | |
| 36,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 37,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 38,1 | 31.00 | 8.50x0.082 Z Con Nest | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 2**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 5 | 1 | - | - | - | - | - |
| 6 | 1 | - | - | - | - | - |
| 8 | 1 | - | - | - | - | - |
| 11 | 1 | - | - | - | - | - |

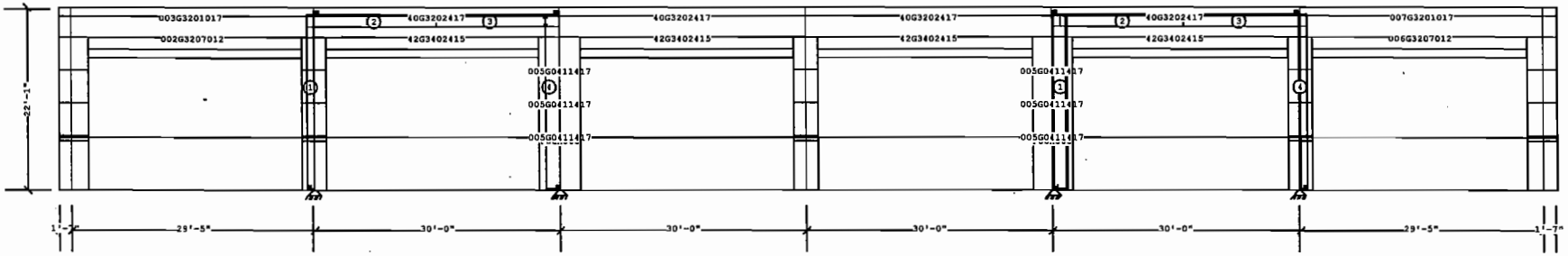




| | | | | | | |
|---|---|---|---|---|---|---|
| 13 | 1 | 2.25 | ( L/159 ) | 15.75 | 1 | W1> |
| 14 | 1 | 0.98 | ( L/361 ) | 14.08 | 1 | W1> |
| 14 | 2 | 0.25 | ( L/1420 ) | 47.00 | 1 | W1> |
| 14 | 3 | 0.44 | ( L/825 ) | 75.50 | 1 | W1> |
| 14 | 4 | 0.44 | ( L/822 ) | 106.50 | 1 | W1> |
| 14 | 5 | 0.25 | ( L/1454 ) | 135.00 | 1 | W1> |
| 14 | 6 | 1.00 | ( L/354 ) | 167.50 | 1 | W1> |
| 16 | 1 | - | - | - | - | - |
| 17 | 1 | - | - | - | - | - |
| 21 | 1 | - | - | - | - | - |
| 22 | 1 | - | - | - | - | - |
| 24 | 1 | - | - | - | - | - |
| 27 | 1 | - | - | - | - | - |
| 29 | 1 | 1.28 | ( L/281 ) | 12.00 | 1 | W1> |
| 29 | 2 | 0.41 | ( L/876 ) | 45.00 | 1 | W1> |
| 29 | 3 | -0.32 | ( L/1139 ) | 83.50 | 1 | W1> |
| 29 | 4 | 1.76 | ( L/204 ) | 106.50 | 1 | W1> |
| 34 | 1 | - | - | - | - | - |
| 35 | 1 | - | - | - | - | - |
| 36 | 1 | - | - | - | - | - |
| 37 | 1 | - | - | - | - | - |
| 38 | 1 | 2.35 | ( L/152 ) | 15.00 | 1 | W1> |

2° SEGMENT
WENSERATION AT
THIS WALL BADLY
JUMPED - FIXED
ON A COPY

– SECONDARY AS RUN ON COPY FOR CHANGED-UP SEGMENTS. ORIG JOB HAD OVERLAID MEMBERS WHICH FOULED DESIGN.–



## Secondary - Summary Report

**Loads and Codes - Shape: Boat Storage Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 8) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 8) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 18 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 19 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 25 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 29 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |

| | | | | |
|---|---|---|---|---|
| 33 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 37 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 45 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 CG + 1.0 W1> | CG + W1> |
| 2 | System | 1.000 | 1.0 CG + 1.0 <W2 | CG + <W2 |
| 3 | System | 1.000 | 1.0 CG + 1.0 WP | CG + WP |
| 4 | System | 1.000 | 1.0 CG + 0.700 E> | CG + E> |
| 5 | System | 1.000 | 1.0 CG + 0.700 <E | CG + <E |

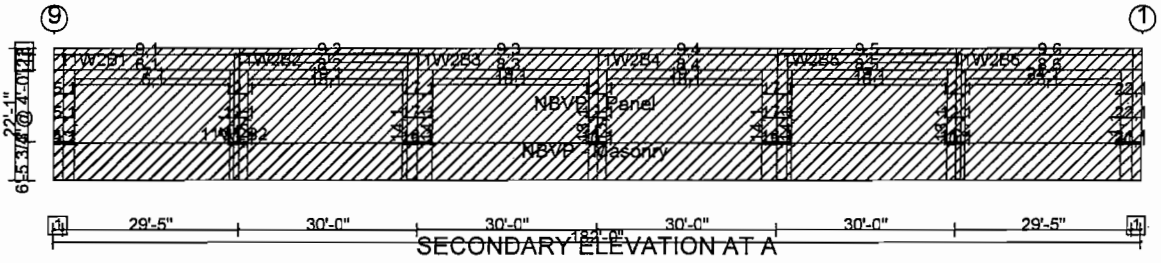
**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 US1* | US1* |
| 6 | System | 1.000 | 240 | 1.0 *US1 | *US1 |
| 7 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 0.500 <E | <E |

## Wall: 2




**Dimension Key**

1 1'-7"
2 2'-6 9/16"
3 1'-0 11/16"
4 3'-6"
5 1'-6"
6 2'-6"
7 1'-0"

**Maximum Secondary Designs for Shape Boat Storage Building on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) | Interior % Bnd | Interior % Shr | Interior % Cmb | Interior % Wcp | Interior Ld Cs | Exterior % Bnd | Exterior % Shr | Exterior % Cmb | Exterior % Wcp | Exterior Ld Cs | Exterior Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 18.48 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 2,1 | 18.48 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 4,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.06 | 0.07 | 0.00 | 1 | | | | | | |
| 5,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.11 | 0.11 | 0.00 | 1 | | | | | | |
| 6,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 7,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 8,1 | 31.00 | 8.50x0.105 Z Con | Yes | 18 | | | | | | | 0.96 | 0.00 | 0.00 | 0.00 | 1 | 0.63 | 0.27 | 0.69 | 0.00 | 1 | 18 |
| 8,2 | 30.00 | 8.50x0.073 Z Con | Yes | 24 | 0.63 | 0.25 | 0.68 | 0.00 | 1 | 24 | 0.48 | 0.89 | 1.01 | 0.00 | 1 | 0.78 | 0.47 | 0.91 | 0.00 | 1 | 24 |
| 8,3 | 30.00 | 8.50x0.073 Z Con | Yes | 24 | 0.78 | 0.47 | 0.92 | 0.00 | 1 | 24 | 0.46 | 0.90 | 1.01 | 0.00 | 1 | 0.67 | 0.47 | 0.82 | 0.00 | 1 | 24 |
| 8,4 | 30.00 | 8.50x0.073 Z Con | Yes | 24 | 0.67 | 0.47 | 0.82 | 0.00 | 1 | 24 | 0.46 | 0.90 | 1.01 | 0.00 | 1 | 0.78 | 0.47 | 0.92 | 0.00 | 1 | 24 |
| 8,5 | 30.00 | 8.50x0.073 Z Con | Yes | 24 | 0.78 | 0.47 | 0.91 | 0.00 | 1 | 24 | 0.48 | 0.89 | 1.01 | 0.00 | 1 | 0.63 | 0.25 | 0.68 | 0.00 | 1 | 24 |
| 8,6 | 31.00 | 8.50x0.105 Z Con | Yes | 18 | 0.63 | 0.27 | 0.69 | 0.00 | 1 | 18 | 0.96 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 9,1 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.84 | 0.00 | 0.00 | 0.00 | 1 | 0.44 | 0.18 | 0.48 | 0.00 | 1 | 12 |
| 9,2 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.44 | 0.16 | 0.47 | 0.00 | 1 | 12 | 0.74 | 0.30 | 0.80 | 0.00 | 1 | 0.33 | 0.14 | 0.36 | 0.00 | 1 | 12 |
| 9,3 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.33 | 0.15 | 0.36 | 0.00 | 1 | 12 | 0.60 | 0.29 | 0.67 | 0.00 | 1 | 0.37 | 0.15 | 0.40 | 0.00 | 1 | 12 |
| 9,4 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.37 | 0.15 | 0.40 | 0.00 | 1 | 12 | 0.60 | 0.29 | 0.67 | 0.00 | 1 | 0.33 | 0.15 | 0.36 | 0.00 | 1 | 12 |
| 9,5 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.33 | 0.14 | 0.36 | 0.00 | 1 | 12 | 0.74 | 0.30 | 0.80 | 0.00 | 1 | 0.44 | 0.16 | 0.47 | 0.00 | 1 | 12 |
| 9,6 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | 0.44 | 0.18 | 0.48 | 0.00 | 1 | 12 | 0.84 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 11,1 | 3.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.00 | 0.03 | 0.03 | 0.00 | 1 | | | | | | |
| 12,1 | 3.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.01 | 0.05 | 0.05 | 0.00 | 1 | | | | | | |
| 13,1 | 18.48 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 14,1 | 18.48 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 16,1 | 5.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.01 | 0.05 | 0.05 | 0.00 | 1 | | | | | | |
| 17,1 | 5.00 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.08 | 0.09 | 0.00 | 1 | | | | | | |
| 18,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 19,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 21,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.02 | 0.06 | 0.07 | 0.00 | 1 | | | | | | |
| 22,1 | 3.50 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.11 | 0.11 | 0.00 | 1 | | | | | | |
| 23,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |
| 24,1 | 26.00 | 0.00x0.000 SP Sim | Yes | 0 | | | | | | | | | | | | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 2**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.82 | ( L/430 ) | 15.03 | 0 | |
| 2 | 1 | 0.82 | ( L/430 ) | 15.03 | 0 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 1 | - | - | - | - | - |
| 5 | 1 | - | - | - | - | - |
| 6 | 1 | - | - | - | - | - |
| 7 | 1 | - | - | - | - | - |
| 8 | 1 | 1.39 | ( L/253 ) | 13.58 | 1 | W1> |
| 8 | 2 | 0.17 | ( L/2124 ) | 49.50 | 1 | W1> |
| 8 | 3 | 0.54 | ( L/673 ) | 75.00 | 1 | W1> |
| 8 | 4 | 0.52 | ( L/688 ) | 107.00 | 1 | W1> |
| 8 | 5 | 0.16 | ( L/2207 ) | 133.00 | 1 | W1> |
| 8 | 6 | 1.37 | ( L/257 ) | 168.00 | 1 | W1> |
| 9 | 1 | 0.98 | ( L/361 ) | 14.08 | 1 | W1> |
| 9 | 2 | 0.25 | ( L/1420 ) | 47.00 | 1 | W1> |
| 9 | 3 | 0.44 | ( L/825 ) | 75.50 | 1 | W1> |
| 9 | 4 | 0.44 | ( L/822 ) | 106.50 | 1 | W1> |
| 9 | 5 | 0.25 | ( L/1454 ) | 135.00 | 1 | W1> |
| 9 | 6 | 1.00 | ( L/354 ) | 167.50 | 1 | W1> |
| 11 | 1 | - | - | - | - | - |
| 12 | 1 | - | - | - | - | - |
| 13 | 1 | - | - | - | - | - |
| 14 | 1 | - | - | - | - | - |
| 16 | 1 | - | - | - | - | - |
| 17 | 1 | - | - | - | - | - |
| 18 | 1 | - | - | - | - | - |
| 19 | 1 | - | - | - | - | - |
| 21 | 1 | - | - | - | - | - |
| 22 | 1 | - | - | - | - | - |
| 23 | 1 | - | - | - | - | - |
| 24 | 1 | - | - | - | - | - |

**Hot Rolled Jamb(Id=1,1) : ~~CH 6 x 8.20~~ 8X21.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 1,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 1,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | -0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.24 | 6.00 | 2 | 1 | 0.0 | -0.6 | 53.7 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.48 | 0.04 |
| 25001 | 6.76 | 6.00 | 1 | 1 | 0.0 | 3.1 | -85.5 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.77 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 6.76 | 221.75 | 18.3 | 18.3 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=1,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/330 ) | 0.671 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=2,1) : ~~CH 6 x 8.20~~ 8X21.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 2,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 2,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | -0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.24 | 6.00 | 2 | 3 | 0.0 | 0.2 | 18.1 | 0.0 | 51.6 | 17.3 | 109.6 | 21.3 | 0.17 | 0.01 |
| 25001 | 1.54 | 6.00 | 1 | 1 | 0.0 | 0.7 | -20.9 | 0.0 | 51.6 | 17.3 | 101.9 | 21.3 | 0.21 | 0.04 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.09 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 1.54 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=2,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1119 ) | 0.198 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=3,1) : CH 6 x 8.20** 9X13.4
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.56 | 12.8 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.92 | 19.5 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 32.4 (p) (Includes all plates)
Frame Pricing Weight = 33.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 3,1 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 3,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 3,1 | 1 | 1 | 0.00 | -0.21 | 0.00 | 0.21 | 0.0 | 1.03 | 0.02 | 0.02 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0031 | 0.1875 |
| 3,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 1/7/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 3/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.58 | 6.00 | 1 | 1 | 0.0 | 0.2 | 2.0 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.2 | 2.0 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.58 | 42.00 | 42.0 | 42.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.82 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 42.00 | 42.0 | 42.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.82 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=3,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/41999 ) | 0.000 | 25000 | 2 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandral channel(Id=4,1) : CH ~~6 x 8.20~~** 9X13.4
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 12.3 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 16.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 28.4 (p) (Includes all plates)
Frame Pricing Weight = 29.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 4,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 4,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 4,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 4,1 | 2 | 1 | 0.00 | -0.16 | 0.00 | 0.16 | 0.0 | 1.03 | 0.01 | 0.01 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0024 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 3/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.50 | 6.00 | 1 | 1 | 0.0 | 0.2 | 1.8 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.2 | 1.8 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=4,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/35999 ) | 0.000 | 25001 | 2 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=7,1) : ~~CH 6 x 8.27~~ 9 X 13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 12.3 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 16.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 28.4 (p) (Includes all plates)
Frame Pricing Weight = 29.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 7,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 7,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 7,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 7,1 | 2 | 1 | 0.00 | -0.16 | 0.00 | 0.16 | 0.0 | 1.03 | 0.01 | 0.01 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0024 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 3/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.50 | 6.00 | 1 | 1 | 0.0 | 0.5 | 4.2 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.04 | 0.03 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.4 | 4.2 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.04 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/L1 in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.54 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.54 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=7,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/27827 ) | 0.001 | 25000 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=9,1) : ~~CH 10 x 15.30~~ NEEDED 8" JAMB = MC8X21.4 TYP!**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.60 | 0.4360 | 0.2400 | 10.00 | 10.00 | 9.24 | 147.7 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.60 | 0.4360 | 0.2400 | 10.00 | 10.00 | 9.24 | 147.7 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 295.5 (p) (Includes all plates)
Frame Pricing Weight = 297.0 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 9,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 9,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 9,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 9,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/5/12 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.24 | 10.00 | 1 | 1 | 0.0 | -2.2 | -119.9 | 0.0 | 96.8 | 34.6 | 121.3 | 50.5 | 0.99 | 0.06 |
| 25001 | 0.00 | 10.00 | 1 | 1 | 0.0 | 2.2 | -119.9 | 0.0 | 96.8 | 34.6 | 121.3 | 50.5 | 0.99 | 0.06 |

| Mem. No. | Loc. ft | Lx in. | Ly/L1 in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 221.8 | 221.8 | 4.48 | 4.48 | 67.30 | 2.27 | 13.50 | 1.15 | 15.90 | 2.34 | 0.19 | 51.91 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 221.75 | 221.8 | 221.8 | 4.48 | 4.48 | 67.30 | 2.27 | 13.50 | 1.15 | 15.90 | 2.34 | 0.19 | 51.91 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=9,1) : CH 10 x 15.30**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1005 ) | 0.220 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=10,1) : ~~CH 6 x 8.20~~ 9X13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 12.3 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 16.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 28.4 (p) (Includes all plates)
Frame Pricing Weight = 29.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge 'a' | Weld Size | Beam Cope Side | C | Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 10,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 10,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Available Strength Ratio Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 10,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 10,1 | 2 | 1 | 0.00 | -0.16 | 0.00 | 0.16 | 0.0 | 1.03 | 0.01 | 0.01 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0024 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 3/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 6.00 | 1 | 1 | 0.0 | 0.1 | 0.7 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.01 | 0.00 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.1 | 0.7 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.01 | 0.00 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.53 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.53 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=10,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/35999 ) | 0.000 | 25001 | 2 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=12,1) : ~~CH 6 x 8.20~~ 8X21.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge 'a' | Weld Size | Beam Cope Side | C | Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 12,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 12,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Available Strength Ratio Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 12,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 12,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/5/12 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 6.00 | 1 | 1 | 0.0 | -0.3 | -17.9 | 0.0 | 51.6 | 17.3 | 38.0 | 21.3 | 0.47 | 0.02 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | 0.3 | -17.9 | 0.0 | 51.6 | 17.3 | 38.0 | 21.3 | 0.47 | 0.02 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 221.8 | 221.8 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 221.75 | 221.8 | 221.8 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=12,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1311 ) | 0.169 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=15,1) : ~~CH 6 x 8.20~~ 9 X 13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 12.3 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.48 | 12.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 24.4 (p) (Includes all plates)
Frame Pricing Weight = 24.4 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. Id | Jt. No. | Type | Connection Plate Thick. in. | Height in. | Length in. | Fy ksi | Bolt Group Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | Edge 'a' in. | Weld Size in. | Beam Cope Side | C in. | Depth in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 15,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| Mem. Id | Jt. No. | Load Case | Required Strength Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Available Strength Ratio Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Min. Thickness Beam Web in. | Column in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 15,1 | 2 | 1 | 0.00 | -0.16 | 0.00 | 0.16 | 0.0 | 1.03 | 0.01 | 0.01 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0024 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 3/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Moni-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 6.00 | 1 | 1 | 0.0 | 0.2 | 1.4 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.01 | 0.01 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.2 | 1.4 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.01 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=15,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/35999 ) | 0.000 | 25001 | 2 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=18,1) : ~~CH 6 x 8.20~~ ~~9X13.4~~ MC8 X 21.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. Id | Jt. No. | Type | Connection Plate Thick. in. | Height in. | Length in. | Fy ksi | Bolt Group Diam. in. | Spec/Jt. | Bolts n | Rows r | Gage in. | Pitch in. | Edge 'a' in. | Weld Size in. | Beam Cope Side | C in. | Depth in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 18,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| Mem. Id | Jt. No. | Load Case | Required Strength Axial k | Shear k | Beam Moment in-k | Pr k | Angle Deg. | Available Strength Ratio Bolt Group C | Bolt Shear % | Bearing % | Rupture % | Max. Ratio % | Description | Min. Thickness Beam Web in. | Column in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 18,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | -0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 6.00 | 2 | 1 | 0.0 | -0.5 | 50.8 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.46 | 0.03 |
| 25001 | 6.76 | 6.00 | 1 | 1 | 0.0 | 2.9 | -80.8 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.72 | 0.17 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.15 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 6.76 | 221.75 | 18.3 | 18.3 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.02 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=18,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/371 ) | 0.597 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Hot Rolled Jamb(Id=19,1) ~~: CH 6 x 8.20~~ MC 8X21.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH | |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH | |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 19,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 19,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 19,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 19,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | -0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.24 | 6.00 | 2 | 1 | 0.0 | -0.4 | 27.7 | 0.0 | 51.6 | 17.3 | 105.5 | 21.3 | 0.26 | 0.02 |
| 25001 | 1.24 | 6.00 | 1 | 1 | 0.0 | 0.9 | -31.2 | 0.0 | 51.6 | 17.3 | 105.5 | 21.3 | 0.30 | 0.05 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.05 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 1.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.05 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=19,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/746 ) | 0.297 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandral channel(Id=20,1) : ~~CH 6 x 8.20~~ 9X13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 2.50 | 20.5 | 36.00 | 36.00 | SS | SS | CH | |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 2.48 | 20.3 | 36.00 | 36.00 | SS | SS | CH | |

Total Frame Weight = 40.8 (p) (Includes all plates)
Frame Pricing Weight = 40.8 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 20,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 20,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 20,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 20,1 | 2 | 1 | 0.00 | -0.26 | 0.00 | 0.26 | 0.0 | 1.03 | 0.02 | 0.02 | 0.02 | 0.32 | OK->ClipLocalBuckling | 0.0039 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 2/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 5/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 2.50 | 6.00 | 1 | 1 | 0.0 | 0.3 | 3.9 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.03 | 0.02 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.3 | 3.9 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.03 | 0.02 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.50 | 60.00 | 60.0 | 60.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 60.00 | 60.0 | 60.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=20,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/18600 ) | 0.003 | 25000 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=23,1) : CH ~~6 x 8.20~~ 9 X 13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 12.3 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 16.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 28.4 (p) (Includes all plates)
Frame Pricing Weight = 29.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge 'a' | Weld Size | Beam Cope Side | C | Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 23,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 23,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Available Strength Ratio Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 23,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 23,1 | 2 | 1 | 0.00 | -0.16 | 0.00 | 0.16 | 0.0 | 1.03 | 0.01 | 0.01 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0024 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 3/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 6.00 | 1 | 1 | 0.0 | 0.4 | 3.6 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.03 | 0.02 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.4 | 3.6 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.03 | 0.02 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=23,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/33768 ) | 0.001 | 25000 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=25,1) : CH ~~10 x 15.30~~ 8 X 21.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.60 | 0.4360 | 0.2400 | 10.00 | 10.00 | 9.24 | 147.7 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.60 | 0.4360 | 0.2400 | 10.00 | 10.00 | 9.24 | 147.7 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 295.5 (p) (Includes all plates)
Frame Pricing Weight = 297.0 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge 'a' | Weld Size | Beam Cope Side | C | Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 25,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 25,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Available Strength Ratio Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 25,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 25,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/5/12 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 10.00 | 1 | 1 | 0.0 | -2.2 | -119.8 | 0.0 | 96.8 | 34.6 | 121.4 | 50.5 | 0.99 | 0.06 |
| 25001 | 0.00 | 10.00 | 1 | 1 | 0.0 | 2.2 | -119.8 | 0.0 | 96.8 | 34.6 | 121.4 | 50.5 | 0.99 | 0.06 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 221.8 | 221.8 | 4.48 | 4.48 | 67.30 | 2.27 | 13.50 | 1.15 | 15.90 | 2.34 | 0.19 | 51.91 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 221.75 | 221.8 | 221.8 | 4.48 | 4.48 | 67.30 | 2.27 | 13.50 | 1.15 | 15.90 | 2.34 | 0.19 | 51.91 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=25,1) : CH 10 x 15.30**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1007 ) | 0.220 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel channel(Id=26,1) : ~~CH 6 x 8.20~~** 16 X 13.4
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 12.3 | 36.00 | 36.00 | SS | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.50 | 16.1 | 36.00 | 36.00 | SS | SS | SS | CH |

Total Frame Weight = 28.4 (p) (Includes all plates)
Frame Pricing Weight = 29.2 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 26,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 26,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 26,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 26,1 | 2 | 1 | 0.00 | -0.16 | 0.00 | 0.16 | 0.0 | 1.03 | 0.01 | 0.01 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0024 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 3/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.50 | 6.00 | 1 | 1 | 0.0 | 0.1 | 0.6 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.00 | 0.00 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.1 | 0.6 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.00 | 0.00 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.50 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 36.00 | 36.0 | 36.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.56 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel channel(Id=26,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/35999 ) | 0.000 | 25001 | 2 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=28,1) : ~~CH 6 x 8.20~~** 8 X 21.4
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 28,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 28,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 28,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 28,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 18/5/12 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.24 | 6.00 | 1 | 1 | 0.0 | -0.3 | -17.9 | 0.0 | 51.6 | 17.3 | 38.0 | 21.3 | 0.47 | 0.02 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | 0.3 | -17.9 | 0.0 | 51.6 | 17.3 | 38.0 | 21.3 | 0.47 | 0.02 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 221.8 | 221.8 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 221.75 | 221.8 | 221.8 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=28,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1314 ) | 0.169 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Hot Rolled Jamb(Id=30,1) : ~~CH 6 x 8.20~~** 8 X 21.4

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge | Weld Size | Side | Beam Cope C | Beam Cope Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 30,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 30,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Available Strength Ratio Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 30,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 30,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | -0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 6.00 | 2 | 1 | 0.0 | -0.6 | 57.7 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.52 | 0.04 |
| 25001 | 6.76 | 6.00 | 1 | 1 | 0.0 | 3.1 | -84.1 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.75 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.13 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 6.76 | 221.75 | 18.3 | 18.3 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=30,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/332 ) | 0.667 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Hot Rolled Jamb(Id=31,1) : ~~CH 6 x 8.20~~** 8 X 21.4

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge | Weld Size | Side | Beam Cope C | Beam Cope Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 31,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 31,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Available Strength Ratio Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 31,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 31,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | -0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 6.00 | 2 | 3 | 0.0 | 0.2 | 18.1 | 0.0 | 51.6 | 17.3 | 109.6 | 21.3 | 0.17 | 0.01 |
| 25001 | 1.54 | 6.00 | 1 | 1 | 0.0 | 0.7 | -20.9 | 0.0 | 51.6 | 17.3 | 101.9 | 21.3 | 0.21 | 0.04 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.09 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 1.54 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=31,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1119 ) | 0.198 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Hot Rolled Jamb(Id=32,1) : ~~CH 6 x 8.20~~** 8X21.4

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH | |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 9.24 | 79.6 | 36.00 | 36.00 | SS | SS | CH | |

Total Frame Weight = 159.2 (p) (Includes all plates)
Frame Pricing Weight = 160.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 32,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 32,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 32,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 32,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25001 | 18/5/12 | 0/0/4 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 0/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 9.24 | 6.00 | 2 | 1 | 0.0 | -0.3 | 21.1 | 0.0 | 51.6 | 17.3 | 108.7 | 21.3 | 0.19 | 0.02 |
| 25001 | 1.54 | 6.00 | 1 | 1 | 0.0 | 0.8 | -27.8 | 0.0 | 51.6 | 17.3 | 104.7 | 21.3 | 0.27 | 0.05 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 9.24 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.08 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 1.54 | 221.75 | 48.0 | 48.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.04 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 150 | 0.700 WP | WP |
| 4 | System | 1.000 | 90 | 90 | 0.500 E> | E> |
| 5 | System | 1.000 | 90 | 90 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Hot Rolled Jamb(Id=32,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/843 ) | 0.263 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandral channel(Id=33,1) : ~~CH 6 x 8.20~~** 8X21.4

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.92 | 19.5 | 36.00 | 36.00 | SS | SS | CH | |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 1.56 | 12.8 | 36.00 | 36.00 | SS | SS | CH | |

Total Frame Weight = 32.4 (p) (Includes all plates)
Frame Pricing Weight = 33.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 33,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 33,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 33,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 33,1 | 2 | 1 | 0.00 | -0.21 | 0.00 | 0.21 | 0.0 | 1.03 | 0.02 | 0.02 | 0.01 | 0.32 | OK->ClipLocalBuckling | 0.0031 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25000 | 1/11/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.92 | 6.00 | 1 | 1 | 0.0 | 0.2 | 2.0 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | -0.2 | 2.0 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 42.00 | 42.0 | 42.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.82 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 42.00 | 42.0 | 42.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.82 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

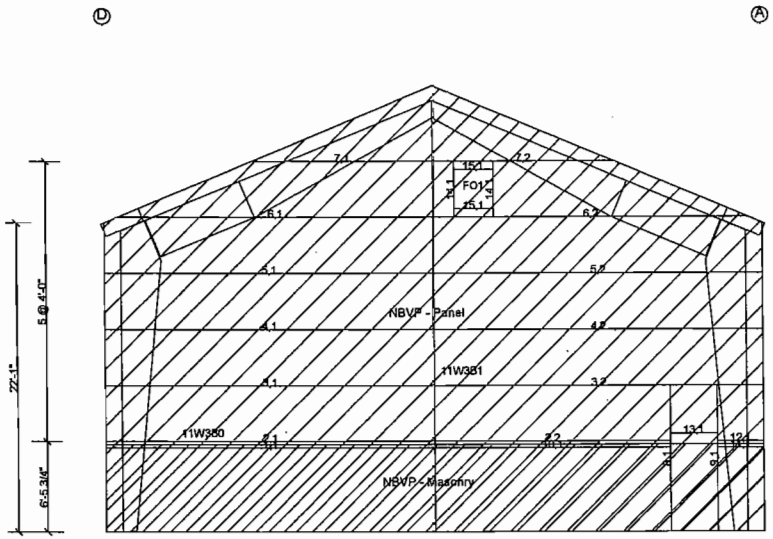
| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=33,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/41999 ) | 0.000 | 25000 | 2 | 5 | <E |

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

## Wall 3




**Dimension Key**
1 3'-4 1/2"
2 3'-3 1/2"
3 1'-6"
4 2'-9 3/4"
5 7 1/8"

**Maximum Secondary Designs for Shape Boat Storage Building on Side 3**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,1 | 23.50 | 8.50x0.059 Z Con | Yes | 36 | | | | | | | 0.72 | 0.00 | 0.00 | 0.00 | 1 | 0.35 | 0.19 | 0.40 | 0.00 | 1 | 12 |
| 2,2 | 16.83 | 8.50x0.059 Z Con | Yes | 12 | 0.35 | 0.16 | 0.39 | 0.00 | 1 | 12 | 0.57 | 0.29 | 0.64 | 0.00 | 1 | | | | | | |
| 3,1 | 23.50 | 8.50x0.073 Z Con | Yes | 36 | | | | | | | 0.83 | 0.32 | 0.89 | 0.00 | 1 | 0.67 | 0.16 | 0.69 | 0.00 | 1 | 36 |
| 3,2 | 23.50 | 8.50x0.082 Z Con | Yes | 36 | 0.67 | 0.20 | 0.70 | 0.00 | 1 | 36 | 1.01 | 0.12 | 1.02 | 0.00 | 1 | | | | | | |
| 4,1 | 23.50 | 8.50x0.065 Z Con | Yes | 36 | | | | | | | 0.87 | 0.45 | 0.98 | 0.00 | 1 | 0.68 | 0.26 | 0.73 | 0.00 | 1 | 24 |
| 4,2 | 23.50 | 8.50x0.065 Z Con | Yes | 24 | 0.68 | 0.26 | 0.73 | 0.00 | 1 | 24 | 0.87 | 0.45 | 0.98 | 0.00 | 1 | | | | | | |
| 5,1 | 23.50 | 8.50x0.065 Z Con | Yes | 36 | | | | | | | 0.89 | 0.47 | 1.00 | 0.00 | 1 | 0.70 | 0.27 | 0.75 | 0.00 | 1 | 24 |
| 5,2 | 23.50 | 8.50x0.065 Z Con | Yes | 24 | 0.70 | 0.26 | 0.75 | 0.00 | 1 | 24 | 0.90 | 0.46 | 1.01 | 0.00 | 1 | | | | | | |
| 6,1 | 22.55 | 8.50x0.059 Z Con | Yes | 36 | | | | | | | 0.93 | 0.00 | 0.65 | 0.00 | 1 | 0.78 | 0.34 | 0.85 | 0.00 | 1 | 36 |
| 6,2 | 22.55 | 8.50x0.059 Z Con | Yes | 36 | 0.78 | 0.35 | 0.86 | 0.00 | 1 | 36 | 0.92 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 7,1 | 12.95 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.30 | 0.33 | 0.45 | 0.00 | 1 | 0.23 | 0.20 | 0.31 | 0.00 | 1 | 12 |
| 7,2 | 12.95 | 8.50x0.059 Z Con | Yes | 12 | 0.23 | 0.20 | 0.31 | 0.00 | 1 | 12 | 0.30 | 0.34 | 0.45 | 0.00 | 1 | | | | | | |





| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,1 | 10.48 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.71 | 0.36 | 0.80 | 0.00 | 1 | | | | | | |
| 9,1 | 10.48 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.28 | 0.18 | 0.33 | 0.00 | 1 | | | | | | |
| 12,1 | 3.29 | 8.50x0.059 Z Sim | Yes | 0 | | | | | | | 0.04 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 13,1 | 3.38 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.02 | 0.00 | 1 | | | | | | |
| 14,1 | 4.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.01 | 0.03 | 0.03 | 0.00 | 1 | | | | | | |
| 15,1 | 2.81 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 3**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 2 | 1 | 0.55 | ( L/516 ) | 10.00 | 1 | W1> |
| 2 | 2 | -0.04 | ( L/4703 ) | 26.50 | 1 | W1> |
| 3 | 1 | 0.31 | ( L/919 ) | 8.00 | 1 | W1> |
| 3 | 2 | 1.12 | ( L/252 ) | 37.50 | 1 | W1> |
| 4 | 1 | 0.64 | ( L/440 ) | 9.50 | 1 | W1> |
| 4 | 2 | 0.65 | ( L/431 ) | 37.50 | 1 | W1> |
| 5 | 1 | 0.70 | ( L/402 ) | 9.50 | 1 | W1> |
| 5 | 2 | 0.63 | ( L/445 ) | 37.50 | 1 | W1> |
| 6 | 1 | 0.55 | ( L/494 ) | 9.00 | 1 | W1> |
| 6 | 2 | 0.55 | ( L/488 ) | 36.05 | 1 | W1> |
| 7 | 1 | 0.06 | ( L/2751 ) | 5.50 | 1 | W1> |
| 7 | 2 | 0.06 | ( L/2584 ) | 20.45 | 1 | W1> |
| 8 | 1 | 0.18 | ( L/693 ) | 5.50 | 1 | W1> |
| 9 | 1 | 0.08 | ( L/1500 ) | 5.50 | 1 | W1> |
| 12 | 1 | - | - | - | - | - |
| 13 | 1 | - | - | - | - | - |
| 14 | 1 | - | - | - | - | - |
| 15 | 1 | - | - | - | - | - |

**Spandral channel(Id=1,1) : CH 9 x 13.40**

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.43 | 0.4130 | 0.2330 | 9.00 | 9.00 | 8.95 | 119.9 | 36.00 | 36.00 | SS | SS | SS | CH |
| 25001 | 2.43 | 0.4130 | 0.2330 | 9.00 | 9.00 | 11.73 | 157.2 | 36.00 | 36.00 | SS | SS | SS | CH |

Total Frame Weight = 277.1 (p) (Includes all plates)
Frame Pricing Weight = 277.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/JL | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | 1 | 0.00 | -1.06 | 0.00 | 1.06 | 0.0 | 1.03 | 0.08 | 0.07 | 0.04 | 0.38 | OK->ClipLocalBuckling | 0.0158 | 0.1875 |
| 1,1 | 2 | 1 | 0.00 | -1.04 | 0.00 | 1.04 | 0.0 | 1.03 | 0.08 | 0.07 | 0.04 | 0.32 | OK->ClipLocalBuckling | 0.0155 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 23/6/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 11.75 | 9.00 | 1 | 1 | 0.0 | -1.1 | -73.4 | 0.0 | 85.1 | 30.2 | 72.4 | 41.9 | 1.01 | 0.04 |
| 25001 | 0.00 | 9.00 | 1 | 1 | 0.0 | 1.0 | -73.4 | 0.0 | 85.1 | 30.2 | 72.4 | 41.9 | 1.01 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 11.75 | 282.00 | 282.0 | 282.0 | 3.94 | 3.94 | 47.80 | 1.75 | 10.60 | 0.95 | 12.60 | 1.94 | 0.15 | 32.26 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 282.00 | 282.0 | 282.0 | 3.94 | 3.94 | 47.80 | 1.75 | 10.60 | 0.95 | 12.60 | 1.94 | 0.15 | 32.26 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=1,1) : CH 9 x 13.40**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/916 ) | 0.308 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandral channel(Id=10,1) : ~~CH 6 x 8.20~~** QX 13.4

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Splice Jt.2 | Codes | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 8.40 | 68.8 | 36.00 | 36.00 | SS | SS | SS | CH |
| 25001 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 8.42 | 72.8 | 36.00 | 36.00 | SS | SS | SS | CH |

Total Frame Weight = 141.7 (p) (Includes all plates)
Frame Pricing Weight = 142.5 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 10,1 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 10,1 | 2 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 10,1 | 1 | 1 | 0.00 | -0.78 | 0.00 | 0.78 | 0.0 | 1.03 | 0.06 | 0.06 | 0.05 | 0.32 | OK->ClipLocalBuckling | 0.0116 | 0.1875 |
| 10,1 | 2 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 16/10/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 8.42 | 6.00 | 1 | 1 | 0.0 | -0.8 | -39.3 | 0.0 | 51.6 | 17.3 | 41.9 | 21.3 | 0.94 | 0.05 |
| 25001 | 0.00 | 6.00 | 1 | 1 | 0.0 | 0.8 | -39.3 | 0.0 | 51.6 | 17.3 | 41.9 | 21.3 | 0.94 | 0.05 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 8.42 | 202.00 | 202.0 | 202.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 202.00 | 202.0 | 202.0 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=10,1) : CH 6 x 8.20**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/656 ) | 0.308 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=11,1) ~~CH 6 x 8.20~~ 9 X 13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.92 | 0.3430 | 0.2000 | 6.00 | 6.00 | 0.49 | 7.8 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 7.8 (p) (Includes all plates)
Frame Pricing Weight = 8.6 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate Thick. | Height | Length | Fy | Bolt Group Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | Edge 'a' | Weld Size | Beam Cope Side | C | Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 11,1 | 1 | | 0.000 | 0.00 | 0.00 | 0 | 0.000 | | 0 | 0 | 0.00 | 0.00 | 0.00 | (0)-0.0000 | | 0.00 | 0.00 |
| 11,1 | 2 | ST | 0.375 | 7.00 | 4.50 | 55 | 0.750 | A325X/ST | 2 | 1 | 0.00 | 3.00 | 2.50 | (2)-0.1250 | None | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Available Strength Ratio Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Min. Thickness Beam Web | Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 11,1 | 1 | -1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.0000 | 0.0000 |
| 11,1 | 2 | 1 | 0.00 | -0.22 | 0.00 | 0.22 | 0.0 | 1.03 | 0.02 | 0.02 | 0.01 | 0.38 | OK->ClipLocalBuckling | 0.0032 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 3/3/8 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.65 | 6.00 | 1 | 1 | 0.0 | 0.2 | -2.1 | 0.0 | 51.6 | 17.3 | 111.5 | 21.3 | 0.02 | 0.01 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.65 | 39.50 | 39.5 | 39.5 | 2.39 | 2.39 | 13.10 | 0.69 | 4.35 | 0.49 | 5.16 | 0.99 | 0.07 | 5.50 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

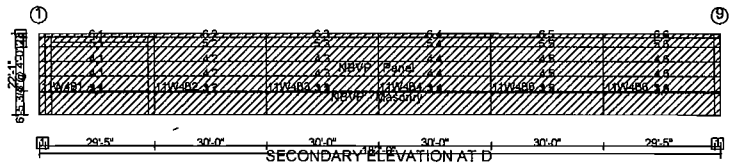
**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |





Wall 4




**Dimension Key**
1 1'-7"
2 2'-6 9/16"
3 1'-0 11/16"

**Maximum Secondary Designs for Shape Boat Storage Building on Side 4**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3,1 | 31.00 | 8.50x0.065 Z Con | Yes | 12 | | | | | | | 0.88 | 0.00 | 0.00 | 0.00 | 1 | 0.50 | 0.19 | 0.53 | 0.00 | 1 | 12 |
| 3,2 | 30.00 | 8.50x0.059 Z Con | Yes | 36 | 0.50 | 0.17 | 0.52 | 0.00 | 1 | 12 | 0.91 | 0.37 | 0.99 | 0.00 | 1 | 0.41 | 0.18 | 0.45 | 0.00 | 1 | 12 |
| 3,3 | 30.00 | 8.50x0.059 Z Con | Yes | 48 | 0.41 | 0.18 | 0.45 | 0.00 | 1 | 12 | 0.75 | 0.36 | 0.83 | 0.00 | 1 | 0.46 | 0.19 | 0.50 | 0.00 | 1 | 12 |
| 3,4 | 30.00 | 8.50x0.059 Z Con | Yes | 48 | 0.46 | 0.19 | 0.50 | 0.00 | 1 | 12 | 0.75 | 0.36 | 0.83 | 0.00 | 1 | 0.41 | 0.18 | 0.45 | 0.00 | 1 | 12 |
| 3,5 | 30.00 | 8.50x0.059 Z Con | Yes | 36 | 0.41 | 0.18 | 0.45 | 0.00 | 1 | 12 | 0.91 | 0.37 | 0.99 | 0.00 | 1 | 0.50 | 0.17 | 0.52 | 0.00 | 1 | 12 |
| 3,6 | 31.00 | 8.50x0.065 Z Con | Yes | 12 | 0.50 | 0.19 | 0.53 | 0.00 | 1 | 12 | 0.88 | 0.00 | 0.61 | 0.00 | 1 | | | | | | |
| 4,1 | 31.00 | 8.50x0.092 Z Con | Yes | 48 | | | | | | | 0.92 | 0.00 | 0.00 | 0.00 | 1 | 0.65 | 0.16 | 0.67 | 0.00 | 1 | 48 |
| 4,2 | 30.00 | 8.50x0.065 Z Con | Yes | 36 | 0.65 | 0.14 | 0.67 | 0.00 | 1 | 36 | 0.79 | 0.40 | 0.88 | 0.00 | 1 | 0.70 | 0.27 | 0.75 | 0.00 | 1 | 36 |
| 4,3 | 30.00 | 8.50x0.059 Z Con | Yes | 48 | 0.70 | 0.28 | 0.75 | 0.00 | 1 | 48 | 0.93 | 0.00 | 0.65 | 0.00 | 1 | 0.88 | 0.34 | 0.94 | 0.00 | 1 | 48 |
| 4,4 | 30.00 | 8.50x0.059 Z Con | Yes | 48 | 0.88 | 0.34 | 0.94 | 0.00 | 1 | 48 | 0.93 | 0.00 | 0.65 | 0.00 | 1 | 0.70 | 0.28 | 0.75 | 0.00 | 1 | 48 |
| 4,5 | 30.00 | 8.50x0.065 Z Con | Yes | 36 | 0.70 | 0.27 | 0.75 | 0.00 | 1 | 36 | 0.79 | 0.40 | 0.88 | 0.00 | 1 | 0.65 | 0.14 | 0.67 | 0.00 | 1 | 36 |
| 4,6 | 31.00 | 8.50x0.092 Z Con | Yes | 48 | 0.65 | 0.16 | 0.67 | 0.00 | 1 | 48 | 0.92 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 5,1 | 31.00 | 8.50x0.073 Z Con | Yes | 48 | | | | | | | 1.02 | 0.00 | 0.00 | 0.00 | 1 | 0.68 | 0.23 | 0.72 | 0.00 | 1 | 48 |
| 5,2 | 30.00 | 8.50x0.059 Z Con | Yes | 36 | 0.68 | 0.20 | 0.71 | 0.00 | 1 | 12 | 0.85 | 0.46 | 0.97 | 0.00 | 1 | 0.54 | 0.22 | 0.58 | 0.00 | 1 | 12 |
| 5,3 | 30.00 | 8.50x0.065 Z Con | Yes | 48 | 0.54 | 0.23 | 0.58 | 0.00 | 1 | 18 | 0.84 | 0.38 | 0.92 | 0.00 | 1 | 0.57 | 0.21 | 0.61 | 0.00 | 1 | 18 |
| 5,4 | 30.00 | 8.50x0.065 Z Con | Yes | 48 | 0.57 | 0.21 | 0.61 | 0.00 | 1 | 18 | 0.84 | 0.38 | 0.92 | 0.00 | 1 | 0.54 | 0.23 | 0.58 | 0.00 | 1 | 18 |
| 5,5 | 30.00 | 8.50x0.059 Z Con | Yes | 36 | 0.54 | 0.22 | 0.58 | 0.00 | 1 | 12 | 0.85 | 0.46 | 0.97 | 0.00 | 1 | 0.68 | 0.20 | 0.71 | 0.00 | 1 | 12 |
| 5,6 | 31.00 | 8.50x0.073 Z Con | Yes | 48 | 0.68 | 0.23 | 0.72 | 0.00 | 1 | 48 | 1.02 | 0.00 | 0.72 | 0.00 | 1 | | | | | | |
| 6,1 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.84 | 0.00 | 0.00 | 0.00 | 1 | 0.44 | 0.18 | 0.48 | 0.00 | 1 | 12 |
| 6,2 | 30.00 | 8.50x0.059 Z Con | Yes | 36 | 0.44 | 0.16 | 0.47 | 0.00 | 1 | 12 | 0.74 | 0.30 | 0.80 | 0.00 | 1 | 0.33 | 0.14 | 0.36 | 0.00 | 1 | 12 |
| 6,3 | 30.00 | 8.50x0.059 Z Con | Yes | 48 | 0.33 | 0.15 | 0.36 | 0.00 | 1 | 12 | 0.60 | 0.29 | 0.67 | 0.00 | 1 | 0.37 | 0.15 | 0.40 | 0.00 | 1 | 12 |
| 6,4 | 30.00 | 8.50x0.059 Z Con | Yes | 48 | 0.37 | 0.15 | 0.40 | 0.00 | 1 | 12 | 0.60 | 0.29 | 0.67 | 0.00 | 1 | 0.33 | 0.15 | 0.36 | 0.00 | 1 | 12 |
| 6,5 | 30.00 | 8.50x0.059 Z Con | Yes | 36 | 0.33 | 0.14 | 0.36 | 0.00 | 1 | 12 | 0.74 | 0.30 | 0.80 | 0.00 | 1 | 0.44 | 0.16 | 0.47 | 0.00 | 1 | 12 |
| 6,6 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | 0.44 | 0.18 | 0.48 | 0.00 | 1 | 12 | 0.84 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 4**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 3 | 1 | 1.10 | ( L/320 ) | 14.58 | 1 | W1> |
| 3 | 2 | 0.32 | ( L/1111 ) | 47.00 | 1 | W1> |
| 3 | 3 | 0.54 | ( L/667 ) | 75.50 | 1 | W1> |
| 3 | 4 | 0.54 | ( L/664 ) | 106.50 | 1 | W1> |
| 3 | 5 | 0.32 | ( L/1135 ) | 135.00 | 1 | W1> |
| 3 | 6 | 1.12 | ( L/314 ) | 167.50 | 1 | W1> |
| 4 | 1 | 1.29 | ( L/274 ) | 14.08 | 1 | W1> |
| 4 | 2 | 0.37 | ( L/979 ) | 47.00 | 1 | W1> |
| 4 | 3 | 0.77 | ( L/465 ) | 75.50 | 1 | W1> |
| 4 | 4 | 0.77 | ( L/465 ) | 106.50 | 1 | W1> |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | 5 | 0.36 | ( L/993 ) | 135.00 | 1 | W1> |
| 4 | 6 | 1.30 | ( L/271 ) | 167.50 | 1 | W1> |
| 5 | 1 | 1.33 | ( L/265 ) | 14.08 | 1 | W1> |
| 5 | 2 | 0.42 | ( L/859 ) | 47.00 | 1 | W1> |
| 5 | 3 | 0.69 | ( L/522 ) | 75.50 | 1 | W1> |
| 5 | 4 | 0.69 | ( L/521 ) | 106.50 | 1 | W1> |
| 5 | 5 | 0.42 | ( L/855 ) | 135.00 | 1 | W1> |
| 5 | 6 | 1.36 | ( L/260 ) | 168.00 | 1 | W1> |
| 6 | 1 | 0.98 | ( L/361 ) | 14.08 | 1 | W1> |
| 6 | 2 | 0.25 | ( L/1420 ) | 47.00 | 1 | W1> |
| 6 | 3 | 0.44 | ( L/825 ) | 75.50 | 1 | W1> |
| 6 | 4 | 0.44 | ( L/822 ) | 106.50 | 1 | W1> |
| 6 | 5 | 0.25 | ( L/1454 ) | 135.00 | 1 | W1> |
| 6 | 6 | 1.00 | ( L/354 ) | 167.50 | 1 | W1> |





**Spandral channel(Id=1,1) : ~~CH 12 x 20.70~~ 9 X 13.4**

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 1.60 | 33.2 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.71 | 304.5 | 36.00 | 36.00 | SS | SS | CH |
| 25002 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.69 | 304.0 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 641.7 (p) (Includes all plates)
Frame Pricing Weight = 641.7 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 1,1 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 1,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 1,1 | 1 | 1 | 0.00 | -1.26 | 0.00 | 1.26 | 0.0 | 1.03 | 0.09 | 0.07 | 0.02 | 0.32 | OK->ClipLocalBuckling | 0.0187 | 0.1875 |
| 1,1 | 2 | 1 | 0.00 | -1.24 | 0.00 | 1.24 | 0.0 | 1.03 | 0.09 | 0.07 | 0.02 | 0.32 | OK->ClipLocalBuckling | 0.0185 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 1/7/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25002 | 31/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 1.58 | 12.00 | 1 | 1 | 0.0 | 0.1 | 1.3 | 0.0 | 131.3 | 48.7 | 125.5 | 75.0 | 0.01 | 0.00 |
| 25001 | 14.71 | 12.00 | 1 | 1 | 0.0 | -1.3 | -109.2 | 0.0 | 131.3 | 48.7 | 125.5 | 75.0 | 0.87 | 0.03 |
| 25002 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.2 | -109.2 | 0.0 | 131.3 | 48.7 | 125.5 | 75.0 | 0.87 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 1.58 | 372.00 | 372.0 | 372.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.17 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 14.71 | 372.00 | 372.0 | 372.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.17 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25002 | 0.00 | 372.00 | 372.0 | 372.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.17 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=1,1) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1403 ) | 0.265 | 25002 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=2,1) : ~~CH 12 x 20.70~~ 9X13.4**

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 15.00 | 318.2 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 15.00 | 318.2 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 636.3 (p) (Includes all plates)
Frame Pricing Weight = 637.8 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 2,1 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 2,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 2,1 | 1 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |
| 2,1 | 2 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases: Axial + Flexure | Controlling Cases: Shear | Required Strength: Axial Pr k | Required Strength: Shear Vr k | Required Strength: Mom-x Mrx in-k | Required Strength: Mom-y Mry in-k | Available Strength: Axial Pc k | Available Strength: Shear Vc k | Available Strength: Mom-x Mcx in-k | Available Strength: Mom-y Mcy in-k | Strength Ratios: Axial + Flexure | Strength Ratios: Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -1.3 | -115.0 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.3 | -115.0 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=2,1) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1238 ) | 0.291 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandral channel(Id=7,1) : CH ~~12 x 20.70~~ 9X13.4**

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 620.1 (p) (Includes all plates)
Frame Pricing Weight = 620.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| Mem. | Jt. | Type | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 7,1 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 7,1 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| Mem. | Jt. | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 7,1 | 1 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |
| 7,1 | 2 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases: Axial + Flexure | Controlling Cases: Shear | Required Strength: Axial Pr k | Required Strength: Shear Vr k | Required Strength: Mom-x Mrx in-k | Required Strength: Mom-y Mry in-k | Available Strength: Axial Pc k | Available Strength: Shear Vc k | Available Strength: Mom-x Mcx in-k | Available Strength: Mom-y Mcy in-k | Strength Ratios: Axial + Flexure | Strength Ratios: Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=7,1) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1241 ) | 0.290 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandral channel(Id=7,2) : CH ~~12 x 20.70~~ 9X13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 620.1 (p) (Includes all plates)
Frame Pricing Weight = 620.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 7,2 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 7,2 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 7,2 | 1 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |
| 7,2 | 2 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=7,2) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1241 ) | 0.290 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.



VP BUILDINGS

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**Spandral channel(Id=7,3) : CH ~~12 x 20.70~~ 9X13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 620.1 (p) (Includes all plates)
Frame Pricing Weight = 620.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 7,3 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 7,3 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | | Available Strength Ratio | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 7,3 | 1 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |
| 7,3 | 2 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandral channel(Id=7,3) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1241 ) | 0.290 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Spandrel channel(Id=7,4) : CH ~~12 x 20.70~~ 9X13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.98 | 310.1 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 620.1 (p) (Includes all plates)
Frame Pricing Weight = 620.1 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 7,4 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 7,4 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 7,4 | 1 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |
| 7,4 | 2 | 1 | 0.00 | -1.28 | 0.00 | 1.28 | 0.0 | 1.03 | 0.09 | 0.07 | 0.03 | 0.32 | OK->ClipLocalBuckling | 0.0190 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 30/0/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 15.00 | 12.00 | 1 | 1 | 0.0 | -1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.3 | -114.8 | 0.0 | 131.3 | 48.7 | 125.8 | 75.0 | 0.91 | 0.03 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 15.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 360.00 | 360.0 | 360.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.14 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

**Controlling Frame Deflection Ratios for Cross Section: Spandrel channel(Id=7,4) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1241 ) | 0.290 | 25001 | 1 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Spandrel channel(Id=7,5) : CH ~~12 x 20.70~~ 9X13.4**
**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.69 | 304.0 | 36.00 | 36.00 | SS | SS | CH |
| 25001 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 14.71 | 304.5 | 36.00 | 36.00 | SS | SS | CH |
| 25002 | 2.94 | 0.5010 | 0.2820 | 12.00 | 12.00 | 1.56 | 32.3 | 36.00 | 36.00 | SS | SS | CH |

Total Frame Weight = 640.8 (p) (Includes all plates)
Frame Pricing Weight = 640.8 (p) (Includes all pieces)

**Spandrel Beam Connection Design (ASD)**

| | | | Connection Plate | | | | Bolt Group | | | | | | Edge | Weld | Beam Cope | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Type | Thick. | Height | Length | Fy | Diam. | Spec/Jt. | Bolts | Rows | Gage | Pitch | 'a' | Size | Side | C | Depth |
| Id | No. | | in. | in. | in. | ksi | in. | | n | r | in. | in. | in. | in. | | in. | in. |
| 7,5 | 1 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |
| 7,5 | 2 | ST | 0.375 | 7.00 | 9.00 | 55 | 0.750 | A325X/ST | 2 | 1 | 4.50 | 3.00 | 2.25 | (2)-0.1250 | None | 0.00 | 0.00 |

| | | Required Strength | | | | | | Available Strength Ratio | | | | | | Min. Thickness | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Load | Axial | Shear | Beam Moment | Pr | Angle | Bolt Group | Bolt Shear | Bearing | Rupture | Max. Ratio | Description | Beam Web | Column |
| Id | No. | Case | k | k | in-k | k | Deg. | C | % | % | % | % | | in. | in. |
| 7,5 | 1 | 1 | 0.00 | -1.24 | 0.00 | 1.24 | 0.0 | 1.03 | 0.09 | 0.07 | 0.02 | 0.32 | OK->ClipLocalBuckling | 0.0185 | 0.1875 |
| 7,5 | 2 | 1 | 0.00 | -1.26 | 0.00 | 1.26 | 0.0 | 1.03 | 0.09 | 0.07 | 0.02 | 0.32 | OK->ClipLocalBuckling | 0.0187 | 0.1875 |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 25000 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 25001 | 29/5/0 | 0/0/0 | No | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 25000 | 14.71 | 12.00 | 1 | 1 | 0.0 | -1.2 | -109.2 | 0.0 | 131.3 | 48.7 | 123.5 | 75.0 | 0.88 | 0.03 |
| 25001 | 0.00 | 12.00 | 1 | 1 | 0.0 | 1.3 | -109.2 | 0.0 | 131.3 | 48.7 | 123.5 | 75.0 | 0.88 | 0.03 |
| 25002 | 0.00 | 12.00 | 1 | 1 | 0.0 | -0.1 | 1.3 | 0.0 | 131.3 | 48.7 | 123.5 | 75.0 | 0.01 | 0.00 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25000 | 14.71 | 372.00 | 372.0 | 372.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.16 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25001 | 0.00 | 372.00 | 372.0 | 372.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.16 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25002 | 0.00 | 372.00 | 372.0 | 372.0 | 6.08 | 6.08 | 129.00 | 3.86 | 21.50 | 1.72 | 25.60 | 3.47 | 0.33 | 127.60 | 1.16 | 1.00 | 1.00 | 1.00 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 240 | 0.500 E> | E> |
| 5 | System | 1.000 | 240 | 240 | 0.500 <E | <E |

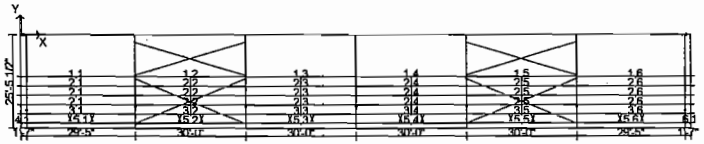
**Controlling Frame Deflection Ratios for Cross Section: Spandrel channel(Id=7,5) : CH 12 x 20.70**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Vertical Deflection for Span 1 | ( L/1403 ) | 0.265 | 25000 | 2 | 1 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Roof: A**




→ ridge

**Maximum Secondary Designs for Shape Boat Storage Building on Side A**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 0.89 | 0.41 | 0.70 | 0.00 | 18 | 0.83 | 0.31 | 0.61 | 0.00 | 18 | 48 |
| 1,2 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.74 | 0.26 | 0.59 | 0.00 | 18 | 24 | 0.86 | 0.58 | 0.85 | 0.00 | 18 | 0.64 | 0.33 | 0.57 | 0.00 | 18 | 24 |
| 1,3 | 30.00 | 11.50x0.065 Z Con | Yes | 36 | 0.64 | 0.35 | 0.57 | 0.00 | 18 | 24 | 1.00 | 0.65 | 0.96 | 0.00 | 18 | 0.76 | 0.37 | 0.65 | 0.00 | 18 | 24 |
| 1,4 | 30.00 | 11.50x0.065 Z Con | Yes | 36 | 0.76 | 0.37 | 0.65 | 0.00 | 18 | 24 | 1.00 | 0.65 | 0.96 | 0.00 | 18 | 0.49 | 0.23 | 0.42 | 0.00 | 18 | 24 |
| 1,5 | 30.00 | 11.50x0.082 Z Con | Yes | 24 | 0.48 | 0.21 | 0.41 | 0.00 | 18 | 24 | 0.99 | 0.35 | 0.80 | 0.00 | 18 | 0.67 | 0.20 | 0.53 | 0.00 | 18 | 24 |
| 1,6 | 31.95 | 11.50x0.082 Z Con | Yes | 24 | 0.77 | 0.28 | 0.56 | 0.00 | 18 | 24 | 0.99 | 0.00 | 0.69 | 0.00 | 18 | | | | | | |
| 2,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 0.98 | 0.44 | 0.77 | 0.00 | 18 | 0.90 | 0.33 | 0.66 | 0.00 | 18 | 48 |
| 2,2 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.81 | 0.28 | 0.64 | 0.00 | 18 | 24 | 0.94 | 0.64 | 0.92 | 0.00 | 18 | 0.72 | 0.37 | 0.63 | 0.00 | 18 | 24 |
| 2,3 | 30.00 | 11.50x0.065 Z Con | Yes | 36 | 0.72 | 0.38 | 0.64 | 0.00 | 18 | 36 | 0.90 | 0.66 | 0.92 | 0.00 | 18 | 0.84 | 0.41 | 0.72 | 0.00 | 18 | 36 |
| 2,4 | 30.00 | 11.50x0.065 Z Con | Yes | 36 | 0.84 | 0.41 | 0.72 | 0.00 | 18 | 36 | 0.90 | 0.66 | 0.92 | 0.00 | 18 | 0.72 | 0.38 | 0.64 | 0.00 | 18 | 36 |
| 2,5 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.72 | 0.37 | 0.63 | 0.00 | 18 | 24 | 0.94 | 0.64 | 0.92 | 0.00 | 18 | 0.81 | 0.28 | 0.64 | 0.00 | 18 | 24 |
| 2,6 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | 0.90 | 0.33 | 0.66 | 0.00 | 18 | 48 | 0.98 | 0.44 | 0.77 | 0.00 | 18 | | | | | | |
| 3,1 | 31.95 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.92 | 0.61 | 0.89 | 0.00 | 18 | 0.70 | 0.34 | 0.61 | 0.00 | 18 | 24 |
| 3,2 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.70 | 0.29 | 0.58 | 0.00 | 18 | 24 | 0.99 | 0.51 | 0.87 | 0.00 | 18 | 0.49 | 0.26 | 0.43 | 0.00 | 18 | 24 |
| 3,3 | 30.00 | 11.50x0.065 Z Con | Yes | 36 | 0.49 | 0.27 | 0.44 | 0.00 | 18 | 24 | 0.75 | 0.49 | 0.72 | 0.00 | 18 | 0.57 | 0.28 | 0.49 | 0.00 | 18 | 24 |
| 3,4 | 30.00 | 11.50x0.065 Z Con | Yes | 36 | 0.57 | 0.28 | 0.49 | 0.00 | 18 | 24 | 0.75 | 0.49 | 0.72 | 0.00 | 18 | 0.49 | 0.27 | 0.44 | 0.00 | 18 | 24 |
| 3,5 | 30.00 | 11.50x0.065 Z Con | Yes | 24 | 0.49 | 0.26 | 0.43 | 0.00 | 18 | 24 | 0.99 | 0.51 | 0.87 | 0.00 | 18 | 0.70 | 0.29 | 0.58 | 0.00 | 18 | 24 |
| 3,6 | 31.95 | 11.50x0.065 Z Con | Yes | 24 | 0.70 | 0.34 | 0.61 | 0.00 | 18 | 24 | 0.92 | 0.61 | 0.89 | 0.00 | 18 | | | | | | |
| 4,1 | 2.53 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.05 | 0.01 | 0.03 | 0.00 | 18 | | | | | | |
| 5,1 | 29.42 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 5,2 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.82 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 5,3 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.82 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 5,4 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.82 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 5,5 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.82 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 5,6 | 29.42 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 6,1 | 2.53 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.01 | 0.02 | 0.00 | 18 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side A**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.65 | ( L/547 ) | 15.53 | 1 | W1> |
| 1 | 2 | 0.16 | ( L/2262 ) | 48.45 | 1 | W1> |
| 1 | 3 | 0.35 | ( L/1041 ) | 76.45 | 1 | W1> |
| 1 | 4 | 0.37 | ( L/961 ) | 107.45 | 1 | W1> |
| 1 | 5 | -0.10 | ( L/3483 ) | 146.95 | 1 | W1> |
| 1 | 6 | 0.87 | ( L/405 ) | 167.95 | 1 | W1> |
| 2 | 1 | 0.72 | ( L/487 ) | 15.03 | 1 | W1> |
| 2 | 2 | 0.18 | ( L/2020 ) | 48.45 | 1 | W1> |
| 2 | 3 | 0.36 | ( L/996 ) | 76.45 | 1 | W1> |
| 2 | 4 | 0.36 | ( L/997 ) | 107.45 | 1 | W1> |





| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 5 | 0.18 | ( L/2037 ) | 135.45 | 1 | W1> |
| 2 | 6 | 0.73 | ( L/481 ) | 168.45 | 1 | W1> |
| 3 | 1 | 0.67 | ( L/526 ) | 15.53 | 1 | W1> |
| 3 | 2 | 0.13 | ( L/2805 ) | 48.45 | 1 | W1> |
| 3 | 3 | 0.27 | ( L/1316 ) | 76.45 | 1 | W1> |
| 3 | 4 | 0.27 | ( L/1310 ) | 107.45 | 1 | W1> |
| 3 | 5 | 0.12 | ( L/2893 ) | 135.45 | 1 | W1> |
| 3 | 6 | 0.68 | ( L/520 ) | 168.45 | 1 | W1> |
| 4 | 1 | - | - | - | - | - |
| 5 | 1 | 0.81 | ( L/434 ) | 14.50 | 1 | W1> |
| 5 | 2 | 0.82 | ( L/439 ) | 44.42 | 1 | W1> |
| 5 | 3 | 0.82 | ( L/439 ) | 74.42 | 1 | W1> |
| 5 | 4 | 0.82 | ( L/439 ) | 104.42 | 1 | W1> |
| 5 | 5 | 0.82 | ( L/439 ) | 134.42 | 1 | W1> |
| 5 | 6 | 0.80 | ( L/440 ) | 163.92 | 1 | W1> |
| 6 | 1 | - | - | - | - | - |
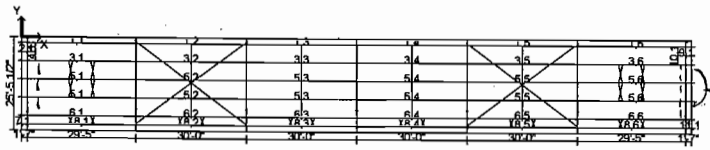
**Purlin Anchorage Forces for Shape Boat Storage Building, Roof A, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.082 | -8.47 | 1 | 7 | 31.95 | N | 25.46 | 1.065 | 0.000 |
| 2 | 0.065 | -7.88 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 3 | 0.065 | -7.88 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 4 | 0.065 | -7.88 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 5 | 0.065 | -7.88 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 6 | 0.082 | -8.47 | 1 | 7 | 31.95 | N | 25.46 | 1.065 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.41 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 0.70 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 0.78 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 0.78 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 0.78 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 6 | 0.70 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 7 | 0.41 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

11.5's w/ clips
NO RQDS.

**Roof B**




11GA (SYM)

**Maximum Secondary Designs for Shape Boat Storage Building on Side B**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 1.02 | 0.00 | 0.65 | 0.00 | 21 | 0.89 | 0.28 | 0.64 | 0.00 | 18 | 48 |
| 1,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.89 | 0.25 | 0.62 | 0.00 | 18 | 48 | 0.84 | 0.37 | 0.65 | 0.00 | 18 | 0.77 | 0.29 | 0.57 | 0.00 | 18 | 48 |
| 1,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.69 | 0.30 | 0.58 | 0.00 | 18 | 48 | 0.80 | 0.72 | 0.91 | 0.00 | 18 | 1.03 | 0.48 | 0.87 | 0.00 | 18 | 48 |
| 1,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 1.03 | 0.49 | 0.88 | 0.00 | 18 | 48 | 0.79 | 0.72 | 0.92 | 0.00 | 18 | 0.66 | 0.30 | 0.55 | 0.00 | 18 | 48 |
| 1,5 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.64 | 0.27 | 0.54 | 0.00 | 18 | 48 | 0.94 | 0.39 | 0.79 | 0.00 | 18 | 0.67 | 0.12 | 0.50 | 0.00 | 18 | 48 |
| 1,6 | 31.95 | 11.50x0.120 Z Con | Yes | 48 | 0.98 | 0.18 | 0.52 | 0.00 | 18 | 48 | 0.91 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 2,1 | 4.70 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.06 | 0.16 | 0.17 | 0.00 | 18 | | | | | | |
| 3,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 1.02 | 0.00 | 0.75 | 0.00 | 21 | 0.65 | 0.32 | 0.73 | 0.00 | 21 | 48 |
| 3,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.80 | 0.22 | 0.56 | 0.00 | 18 | 48 | 0.75 | 0.33 | 0.58 | 0.00 | 18 | 0.70 | 0.26 | 0.52 | 0.00 | 18 | 48 |
| 3,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.56 | 0.34 | 0.66 | 0.00 | 21 | 48 | 0.62 | 0.80 | 1.01 | 0.00 | 21 | 0.81 | 0.54 | 0.97 | 0.00 | 21 | 48 |
| 3,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.81 | 0.54 | 0.98 | 0.00 | 21 | 48 | 0.62 | 0.80 | 1.01 | 0.00 | 21 | 0.55 | 0.34 | 0.65 | 0.00 | 21 | 48 |
| 3,5 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.68 | 0.25 | 0.51 | 0.00 | 18 | 48 | 0.83 | 0.34 | 0.63 | 0.00 | 18 | 0.63 | 0.11 | 0.42 | 0.00 | 18 | 48 |
| 3,6 | 31.95 | 11.50x0.120 Z Con | Yes | 48 | 0.57 | 0.14 | 0.43 | 0.00 | 18 | 48 | 0.74 | 0.00 | 0.53 | 0.00 | 21 | | | | | | |
| 4,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.14 | 0.02 | 0.03 | 0.00 | 18 | | | | | | |
| 5,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 1.02 | 0.00 | 0.74 | 0.00 | 21 | 0.65 | 0.32 | 0.72 | 0.00 | 21 | 48 |
| 5,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.73 | 0.20 | 0.51 | 0.00 | 18 | 48 | 0.60 | 0.42 | 0.74 | 0.00 | 21 | 0.56 | 0.33 | 0.65 | 0.00 | 21 | 48 |
| 5,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.56 | 0.34 | 0.66 | 0.00 | 21 | 48 | 0.61 | 0.80 | 1.00 | 0.00 | 21 | 0.80 | 0.54 | 0.97 | 0.00 | 21 | 48 |
| 5,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.80 | 0.54 | 0.97 | 0.00 | 21 | 48 | 0.61 | 0.80 | 1.00 | 0.00 | 21 | 0.56 | 0.34 | 0.66 | 0.00 | 21 | 48 |
| 5,5 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.56 | 0.33 | 0.65 | 0.00 | 21 | 48 | 0.60 | 0.42 | 0.74 | 0.00 | 21 | 0.73 | 0.20 | 0.51 | 0.00 | 18 | 48 |
| 5,6 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | 0.65 | 0.32 | 0.72 | 0.00 | 21 | 48 | 1.02 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 6,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 0.89 | 0.00 | 0.57 | 0.00 | 21 | 0.70 | 0.25 | 0.51 | 0.00 | 18 | 48 |
| 6,2 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.63 | 0.22 | 0.50 | 0.00 | 18 | 24 | 0.64 | 0.63 | 0.90 | 0.00 | 21 | 0.50 | 0.37 | 0.62 | 0.00 | 21 | 24 |
| 6,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.50 | 0.38 | 0.63 | 0.00 | 21 | 24 | 0.75 | 0.69 | 1.02 | 0.00 | 21 | 0.57 | 0.40 | 0.70 | 0.00 | 21 | 24 |
| 6,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.57 | 0.40 | 0.70 | 0.00 | 21 | 24 | 0.75 | 0.69 | 1.02 | 0.00 | 21 | 0.50 | 0.38 | 0.63 | 0.00 | 21 | 24 |
| 6,5 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.50 | 0.37 | 0.62 | 0.00 | 21 | 24 | 0.64 | 0.63 | 0.90 | 0.00 | 21 | 0.63 | 0.22 | 0.50 | 0.00 | 18 | 24 |
| 6,6 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | 0.70 | 0.25 | 0.51 | 0.00 | 18 | 48 | 0.89 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 7,1 | 2.53 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.02 | 0.00 | 18 | | | | | | |
| 8,1 | 29.42 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 8,2 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 8,3 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 8,4 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 8,5 | 30.00 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 8,6 | 29.42 | 11.50x0.120 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 21 | | | | | | |
| 9,1 | 4.70 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.06 | 0.16 | 0.17 | 0.00 | 18 | | | | | | |
| 10,1 | 5.00 | 8.50x0.059 C Sim | Yes | 0 | | | | | | | 0.24 | 0.04 | 0.06 | 0.00 | 18 | | | | | | |
| 11,1 | 2.53 | 11.50x0.065 Z Sim | Yes | 0 | | | | | | | 0.03 | 0.00 | 0.02 | 0.00 | 18 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side B**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|





| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.80 | ( L/442 ) | 15.03 | 1 | W1> |
| 1 | 2 | 0.13 | ( L/2851 ) | 48.45 | 1 | W1> |
| 1 | 3 | 0.39 | ( L/925 ) | 76.45 | 1 | W1> |
| 1 | 4 | 0.44 | ( L/813 ) | 107.45 | 1 | W1> |
| 1 | 5 | -0.13 | ( L/2689 ) | 146.45 | 1 | W1> |
| 1 | 6 | 0.87 | ( L/405 ) | 167.95 | 1 | W1> |
| 2 | 1 | - | - | - | - | - |
| 3 | 1 | -0.76 | ( L/461 ) | 15.03 | 7 | L |
| 3 | 2 | -0.12 | ( L/3085 ) | 48.45 | 7 | L |
| 3 | 3 | -0.39 | ( L/934 ) | 76.45 | 7 | L |
| 3 | 4 | 0.38 | ( L/946 ) | 107.45 | 1 | W1> |
| 3 | 5 | -0.14 | ( L/2589 ) | 135.95 | 7 | L |
| 3 | 6 | 0.66 | ( L/538 ) | 168.45 | 1 | W1> |
| 4 | 1 | - | - | - | - | - |
| 5 | 1 | -0.75 | ( L/468 ) | 15.03 | 7 | L |
| 5 | 2 | -0.12 | ( L/3005 ) | 48.45 | 7 | L |
| 5 | 3 | -0.38 | ( L/942 ) | 76.45 | 7 | L |
| 5 | 4 | -0.38 | ( L/940 ) | 107.45 | 7 | L |
| 5 | 5 | -0.12 | ( L/3065 ) | 135.45 | 7 | L |
| 5 | 6 | -0.76 | ( L/465 ) | 168.45 | 7 | L |
| 6 | 1 | -0.57 | ( L/622 ) | 15.03 | 7 | L |
| 6 | 2 | -0.16 | ( L/2190 ) | 47.95 | 7 | L |
| 6 | 3 | -0.32 | ( L/1126 ) | 76.45 | 7 | L |
| 6 | 4 | -0.32 | ( L/1122 ) | 107.45 | 7 | L |
| 6 | 5 | -0.16 | ( L/2188 ) | 135.95 | 7 | L |
| 6 | 6 | -0.57 | ( L/615 ) | 168.45 | 7 | L |
| 7 | 1 | - | - | - | - | - |
| 8 | 1 | 0.80 | ( L/443 ) | 14.50 | 1 | W1> |
| 8 | 2 | 0.81 | ( L/443 ) | 44.42 | 1 | W1> |
| 8 | 3 | 0.81 | ( L/443 ) | 74.42 | 1 | W1> |
| 8 | 4 | 0.81 | ( L/443 ) | 104.42 | 1 | W1> |
| 8 | 5 | 0.81 | ( L/443 ) | 134.42 | 1 | W1> |
| 8 | 6 | 0.80 | ( L/443 ) | 163.92 | 1 | W1> |
| 9 | 1 | - | - | - | - | - |
| 10 | 1 | - | - | - | - | - |
| 11 | 1 | - | - | - | - | - |

**Purlin Anchorage Forces for Shape Boat Storage Building, Roof B, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.082 | -15.22 | 1 | 7 | 31.95 | N | 25.46 | 1.065 | 0.000 |
| 2 | 0.082 | -14.27 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 3 | 0.065 | -14.27 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 4 | 0.065 | -14.27 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 5 | 0.082 | -14.27 | 1 | 6 | 30.00 | N | 25.46 | 1.000 | 0.000 |
| 6 | 0.120 | -15.22 | 1 | 7 | 31.95 | N | 25.46 | 1.065 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.74 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 1.06 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 1.22 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 1.41 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 1.22 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 6 | 0.89 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 7 | 0.50 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Wall: 2 - Canopy 1




**Maximum Secondary Designs for Shape Boat Storage Building on Side 2**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 31.95 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.76 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,2 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,3 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,4 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,5 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.80 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,6 | 31.95 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.76 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 2**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.61 | ( L/582 ) | 17.03 | 1 | W1> |
| 1 | 2 | 0.67 | ( L/538 ) | 46.95 | 1 | W1> |
| 1 | 3 | 0.67 | ( L/538 ) | 76.95 | 1 | W1> |
| 1 | 4 | 0.67 | ( L/538 ) | 106.95 | 1 | W1> |
| 1 | 5 | 0.67 | ( L/538 ) | 136.95 | 1 | W1> |
| 1 | 6 | 0.61 | ( L/581 ) | 166.45 | 1 | W1> |

**Purlin Anchorage Forces for Shape Boat Storage Building, Roof Wall: 2 - Canopy 1, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|





## Wall: 4 - Canopy 1




**Maximum Secondary Designs for Shape Boat Storage Building on Side 4**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 31.95 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.70 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,2 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.73 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,3 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.73 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,4 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.73 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,5 | 30.00 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.73 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |
| 1,6 | 31.95 | 11.50x0.082 Z Sim | Yes | 0 | | | | | | | 0.68 | 0.00 | 0.00 | 0.00 | 18 | | | | | | |

**Maximum Secondary Deflections for Shape Boat Storage Building on Side 4**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.56 | ( L/632 ) | 17.03 | 1 | W1> |
| 1 | 2 | 0.61 | ( L/587 ) | 46.95 | 1 | W1> |
| 1 | 3 | 0.61 | ( L/587 ) | 76.95 | 1 | W1> |
| 1 | 4 | 0.61 | ( L/587 ) | 106.95 | 1 | W1> |
| 1 | 5 | 0.61 | ( L/587 ) | 136.95 | 1 | W1> |
| 1 | 6 | 0.55 | ( L/646 ) | 166.45 | 1 | W1> |

**Purlin Anchorage Forces for Shape Boat Storage Building, Roof Wall: 4 - Canopy 1, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|

**Loads and Codes - Shape: Clerestory A**

City: Stennis Space Center County: Hancock State: Mississippi Country: United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.741)
Parts Wind Exposure Factor: 0.741

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 30/0/0
Primary Zone Strip Width: 18/2/12
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 27.24 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4973
Bracing Seismic Period: 0.2968
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Design Load Combinations - Purlin**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L | D + CG + L |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S | D + CG + S |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 1) |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF1 | D + CG + PF1(Span 8) |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 1) |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PH1 | D + CG + PH1(Span 8) |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 1 and 2) |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 2 and 3) |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 3 and 4) |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 4 and 5) |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 5 and 6) |
| 12 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 6 and 7) |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 PF2 | D + CG + PF2(Spans 7 and 8) |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 17 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 22 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 23 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 24 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 25 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 26 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 27 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 28 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 31 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |





| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
|---|---|---|---|---|
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 35 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 43 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |

**Design Load Combinations - Girt**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 W1> | W1> |
| 2 | System | 1.000 | 1.0 <W2 | <W2 |
| 3 | System | 1.000 | 1.0 WP | WP |

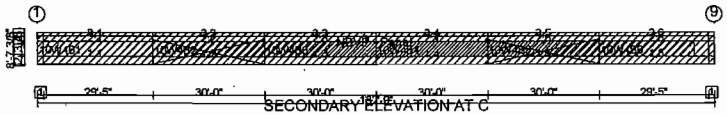
**Deflection Load Combinations - Purlin**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 240 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 240 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 240 | 0.700 WP | WP |
| 4 | System | 1.000 | 240 | 1.0 S | S |
| 5 | System | 1.000 | 240 | 1.0 L | L |

**Deflection Load Combinations - Girt**

| No. | Origin | Factor | Deflection | Application | Description |
|---|---|---|---|---|---|
| 1 | System | 1.000 | 150 | 0.700 W1> | W1> |
| 2 | System | 1.000 | 150 | 0.700 <W2 | <W2 |
| 3 | System | 1.000 | 150 | 0.700 WP | WP |

Wall: 4




**Dimension Key**
1 1'-7"
2 2'-2"
3 4'-0 1/4"
4 1'-4 7/8"
5 1'-0 1/4"

**Maximum Secondary Designs for Shape Clerestory A on Side 4**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 31.00 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,2 | 30.00 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 0.86 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,3 | 30.00 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 0.86 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,4 | 30.00 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 0.86 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,5 | 30.00 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 0.86 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 1,6 | 31.00 | 8.50x0.105 C Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,1 | 31.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,2 | 30.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.85 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,3 | 30.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.85 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,4 | 30.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.85 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,5 | 30.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.85 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 2,6 | 31.00 | 8.50x0.092 C Sim | Yes | 0 | | | | | | | 0.81 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |
| 3,1 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | | | | | | | 0.60 | 0.00 | 0.00 | 0.00 | 1 | 0.31 | 0.13 | 0.34 | 0.00 | 1 | 12 |
| 3,2 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.31 | 0.11 | 0.33 | 0.00 | 1 | 12 | 0.53 | 0.21 | 0.57 | 0.00 | 1 | 0.23 | 0.10 | 0.25 | 0.00 | 1 | 12 |
| 3,3 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.23 | 0.11 | 0.26 | 0.00 | 1 | 12 | 0.43 | 0.20 | 0.47 | 0.00 | 1 | 0.26 | 0.11 | 0.28 | 0.00 | 1 | 12 |
| 3,4 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.26 | 0.11 | 0.28 | 0.00 | 1 | 12 | 0.43 | 0.20 | 0.47 | 0.00 | 1 | 0.23 | 0.11 | 0.26 | 0.00 | 1 | 12 |
| 3,5 | 30.00 | 8.50x0.059 Z Con | Yes | 12 | 0.23 | 0.10 | 0.25 | 0.00 | 1 | 12 | 0.53 | 0.21 | 0.57 | 0.00 | 1 | 0.31 | 0.11 | 0.33 | 0.00 | 1 | 12 |
| 3,6 | 31.00 | 8.50x0.059 Z Con | Yes | 12 | 0.31 | 0.13 | 0.34 | 0.00 | 1 | 12 | 0.60 | 0.00 | 0.00 | 0.00 | 1 | | | | | | |

**Maximum Secondary Deflections for Shape Clerestory A on Side 4**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 2.15 | ( L/164 ) | 16.08 | 1 | W1> |
| 1 | 2 | 2.36 | ( L/153 ) | 46.00 | 1 | W1> |
| 1 | 3 | 2.36 | ( L/153 ) | 76.00 | 1 | W1> |
| 1 | 4 | 2.36 | ( L/153 ) | 106.00 | 1 | W1> |
| 1 | 5 | 2.36 | ( L/153 ) | 136.00 | 1 | W1> |
| 1 | 6 | 2.15 | ( L/164 ) | 165.50 | 1 | W1> |
| 2 | 1 | 2.15 | ( L/164 ) | 16.08 | 1 | W1> |
| 2 | 2 | 2.35 | ( L/153 ) | 46.00 | 1 | W1> |
| 2 | 3 | 2.35 | ( L/153 ) | 76.00 | 1 | W1> |
| 2 | 4 | 2.35 | ( L/153 ) | 106.00 | 1 | W1> |
| 2 | 5 | 2.35 | ( L/153 ) | 136.00 | 1 | W1> |
| 2 | 6 | 2.15 | ( L/164 ) | 165.50 | 1 | W1> |
| 3 | 1 | 0.70 | ( L/507 ) | 14.08 | 1 | W1> |
| 3 | 2 | 0.18 | ( L/1992 ) | 47.00 | 1 | W1> |
| 3 | 3 | 0.31 | ( L/1159 ) | 75.50 | 1 | W1> |
| 3 | 4 | 0.31 | ( L/1155 ) | 106.50 | 1 | W1> |
| 3 | 5 | 0.18 | ( L/2039 ) | 135.00 | 1 | W1> |

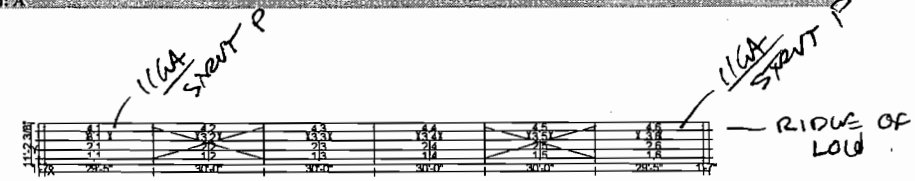


R's ON CL'S CHANGED TO MAKE RUN BRACE TO ADJACENT MEMBER @ 10' CTRS



| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 6 | 0.71 | ( L/498 ) | 167.50 | 1 | W1> |

**Roof: A**




**Maximum Secondary Designs for Shape Clerestory A on Side A**

| Des Id | Len (ft) | Description | Design Status | Detail Lap (in.) | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) | Interior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Exterior % Bnd | % Shr | % Cmb | % Wcp | Ld Cs | Lap (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 0.97 | 0.41 | 0.75 | 0.00 | 16 | 0.88 | 0.31 | 0.64 | 0.00 | 16 | 48 |
| 1,2 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.79 | 0.27 | 0.62 | 0.00 | 16 | 24 | 0.94 | 0.61 | 0.90 | 0.00 | 16 | 0.66 | 0.34 | 0.58 | 0.00 | 16 | 24 |
| 1,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.66 | 0.36 | 0.59 | 0.00 | 16 | 36 | 0.83 | 0.62 | 0.86 | 0.00 | 16 | 0.80 | 0.38 | 0.69 | 0.00 | 16 | 36 |
| 1,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.80 | 0.38 | 0.69 | 0.00 | 16 | 36 | 0.83 | 0.62 | 0.86 | 0.00 | 16 | 0.66 | 0.36 | 0.59 | 0.00 | 16 | 36 |
| 1,5 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.66 | 0.34 | 0.58 | 0.00 | 16 | 24 | 0.94 | 0.61 | 0.90 | 0.00 | 16 | 0.79 | 0.27 | 0.62 | 0.00 | 16 | 24 |
| 1,6 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | 0.88 | 0.31 | 0.64 | 0.00 | 16 | 48 | 0.97 | 0.41 | 0.75 | 0.00 | 16 | | | | | | |
| 2,1 | 31.95 | 11.50x0.082 Z Con | Yes | 36 | | | | | | | 0.73 | 0.32 | 0.57 | 0.00 | 16 | 0.66 | 0.23 | 0.48 | 0.00 | 16 | 36 |
| 2,2 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.60 | 0.21 | 0.47 | 0.00 | 16 | 24 | 0.87 | 0.51 | 0.80 | 0.00 | 16 | 0.52 | 0.27 | 0.46 | 0.00 | 16 | 24 |
| 2,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.52 | 0.28 | 0.47 | 0.00 | 16 | 24 | 0.80 | 0.52 | 0.77 | 0.00 | 16 | 0.61 | 0.30 | 0.52 | 0.00 | 16 | 24 |
| 2,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.61 | 0.30 | 0.52 | 0.00 | 16 | 24 | 0.80 | 0.52 | 0.77 | 0.00 | 16 | 0.52 | 0.28 | 0.47 | 0.00 | 16 | 24 |
| 2,5 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.52 | 0.27 | 0.46 | 0.00 | 16 | 24 | 0.87 | 0.51 | 0.80 | 0.00 | 16 | 0.60 | 0.21 | 0.47 | 0.00 | 16 | 24 |
| 2,6 | 31.95 | 11.50x0.082 Z Con | Yes | 36 | 0.66 | 0.23 | 0.48 | 0.00 | 16 | 36 | 0.73 | 0.32 | 0.57 | 0.00 | 16 | | | | | | |
| 3,1 | 31.95 | 11.50x0.065 Z Con | Yes | 24 | | | | | | | 0.93 | 0.60 | 0.90 | 0.00 | 16 | 0.70 | 0.34 | 0.60 | 0.00 | 16 | 24 |
| 3,2 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.70 | 0.30 | 0.58 | 0.00 | 16 | 24 | 0.99 | 0.52 | 0.88 | 0.00 | 16 | 0.50 | 0.26 | 0.44 | 0.00 | 16 | 24 |
| 3,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.50 | 0.27 | 0.45 | 0.00 | 16 | 24 | 0.76 | 0.50 | 0.73 | 0.00 | 16 | 0.58 | 0.28 | 0.50 | 0.00 | 16 | 24 |
| 3,4 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.58 | 0.28 | 0.50 | 0.00 | 16 | 24 | 0.76 | 0.50 | 0.73 | 0.00 | 16 | 0.50 | 0.27 | 0.45 | 0.00 | 16 | 24 |
| 3,5 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.50 | 0.26 | 0.44 | 0.00 | 16 | 24 | 0.99 | 0.52 | 0.88 | 0.00 | 16 | 0.70 | 0.30 | 0.58 | 0.00 | 16 | 24 |
| 3,6 | 31.95 | 11.50x0.065 Z Con | Yes | 24 | 0.70 | 0.34 | 0.60 | 0.00 | 16 | 24 | 0.93 | 0.60 | 0.90 | 0.00 | 16 | | | | | | |
| 4,1 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | | | | | | | 0.97 | 0.00 | 0.68 | 0.00 | 16 | 0.84 | 0.30 | 0.68 | 0.00 | 16 | 48 |
| 4,2 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.96 | 0.27 | 0.67 | 0.00 | 16 | 48 | 0.88 | 0.41 | 0.69 | 0.00 | 16 | 0.87 | 0.32 | 0.65 | 0.00 | 16 | 48 |
| 4,3 | 30.00 | 11.50x0.065 Z Con | Yes | 48 | 0.79 | 0.34 | 0.65 | 0.00 | 16 | 48 | 0.85 | 0.79 | 0.99 | 0.00 | 16 | 0.89 | 0.35 | 0.72 | 0.00 | 16 | 48 |
| 4,4 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.98 | 0.35 | 0.72 | 0.00 | 16 | 48 | 0.62 | 0.39 | 0.56 | 0.00 | 16 | 0.71 | 0.25 | 0.52 | 0.00 | 16 | 48 |
| 4,5 | 30.00 | 11.50x0.082 Z Con | Yes | 48 | 0.71 | 0.24 | 0.52 | 0.00 | 16 | 48 | 0.88 | 0.41 | 0.70 | 0.00 | 16 | 0.96 | 0.27 | 0.67 | 0.00 | 16 | 48 |
| 4,6 | 31.95 | 11.50x0.082 Z Con | Yes | 48 | 0.84 | 0.30 | 0.68 | 0.00 | 16 | 48 | 0.97 | 0.00 | 0.00 | 0.00 | 16 | | | | | | |

11GA - START LOAD ADDED

**Maximum Secondary Deflections for Shape Clerestory A on Side A**

| Design Id | Segment | Deflection(in.) | Ratio | Location(ft) | Load Case | Description |
|---|---|---|---|---|---|---|
| 1 | 1 | 0.79 | ( L/447 ) | 15.03 | 1 | W1> |
| 1 | 2 | 0.15 | ( L/2433 ) | 48.45 | 1 | W1> |
| 1 | 3 | 0.35 | ( L/1033 ) | 76.45 | 1 | W1> |
| 1 | 4 | 0.35 | ( L/1033 ) | 107.45 | 1 | W1> |
| 1 | 5 | 0.15 | ( L/2468 ) | 135.45 | 1 | W1> |
| 1 | 6 | 0.80 | ( L/443 ) | 168.95 | 1 | W1> |
| 2 | 1 | 0.61 | ( L/579 ) | 15.03 | 1 | W1> |
| 2 | 2 | 0.13 | ( L/2764 ) | 48.45 | 1 | W1> |
| 2 | 3 | 0.29 | ( L/1241 ) | 76.45 | 1 | W1> |
| 2 | 4 | 0.29 | ( L/1236 ) | 107.45 | 1 | W1> |
| 2 | 5 | 0.13 | ( L/2805 ) | 135.45 | 1 | W1> |
| 2 | 6 | 0.62 | ( L/574 ) | 168.95 | 1 | W1> |
| 3 | 1 | 0.68 | ( L/518 ) | 15.03 | 1 | W1> |
| 3 | 2 | 0.13 | ( L/2709 ) | 48.45 | 1 | W1> |
| 3 | 3 | 0.28 | ( L/1307 ) | 76.45 | 1 | W1> |
| 3 | 4 | 0.28 | ( L/1301 ) | 107.45 | 1 | W1> |
| 3 | 5 | 0.13 | ( L/2787 ) | 135.45 | 1 | W1> |





| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 6 | 0.69 | ( L/512 ) | 168.45 | 1 | W1> |
| 4 | 1 | 0.82 | ( L/430 ) | 15.03 | 1 | W1> |
| 4 | 2 | 0.16 | ( L/2238 ) | 47.95 | 1 | W1> |
| 4 | 3 | 0.44 | ( L/827 ) | 76.45 | 1 | W1> |
| 4 | 4 | 0.34 | ( L/1046 ) | 107.45 | 1 | W1> |
| 4 | 5 | 0.17 | ( L/2142 ) | 135.45 | 1 | W1> |
| 4 | 6 | 0.82 | ( L/428 ) | 168.95 | 1 | W1> |

**Purlin Anchorage Forces for Shape Clerestory A, Roof A, Panel Type is SLR2, Pitch = 5.000:12**

| Bay | Thickness | Force(k) | Ld Case | # Purlins | Length | Simple? | Diaphragm Width | Allowable Defl | Actual Defl |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.082 | -7.58 | 1 | 4 | 31.95 | N | 11.20 | 1.065 | 0.000 |
| 2 | 0.065 | -7.12 | 1 | 4 | 30.00 | N | 11.20 | 1.000 | 0.000 |
| 3 | 0.065 | -7.12 | 1 | 4 | 30.00 | N | 11.20 | 1.000 | 0.000 |
| 4 | 0.065 | -7.12 | 1 | 4 | 30.00 | N | 11.20 | 1.000 | 0.000 |
| 5 | 0.065 | -7.12 | 1 | 4 | 30.00 | N | 11.20 | 1.000 | 0.000 |
| 6 | 0.082 | -7.58 | 1 | 4 | 31.95 | N | 11.20 | 1.065 | 0.000 |

| Frm-Line | Force(k) | Anch. Allow | Required Clips | Actual Clips | Diaphragm Allow | Diaphragm Shr | Stress |
|---|---|---|---|---|---|---|---|
| 1 | 0.62 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 2 | 0.99 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 3 | 1.04 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 4 | 1.04 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 5 | 1.04 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 6 | 0.99 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |
| 7 | 0.62 | 0.00 | 0 | 0 | 0.017 | 0.000 | 0.000 |

## Framing - Summary Report

**Loads and Codes - Shape: Boat Storage Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code — Built Up: 05AISC - ASD — Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure — Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

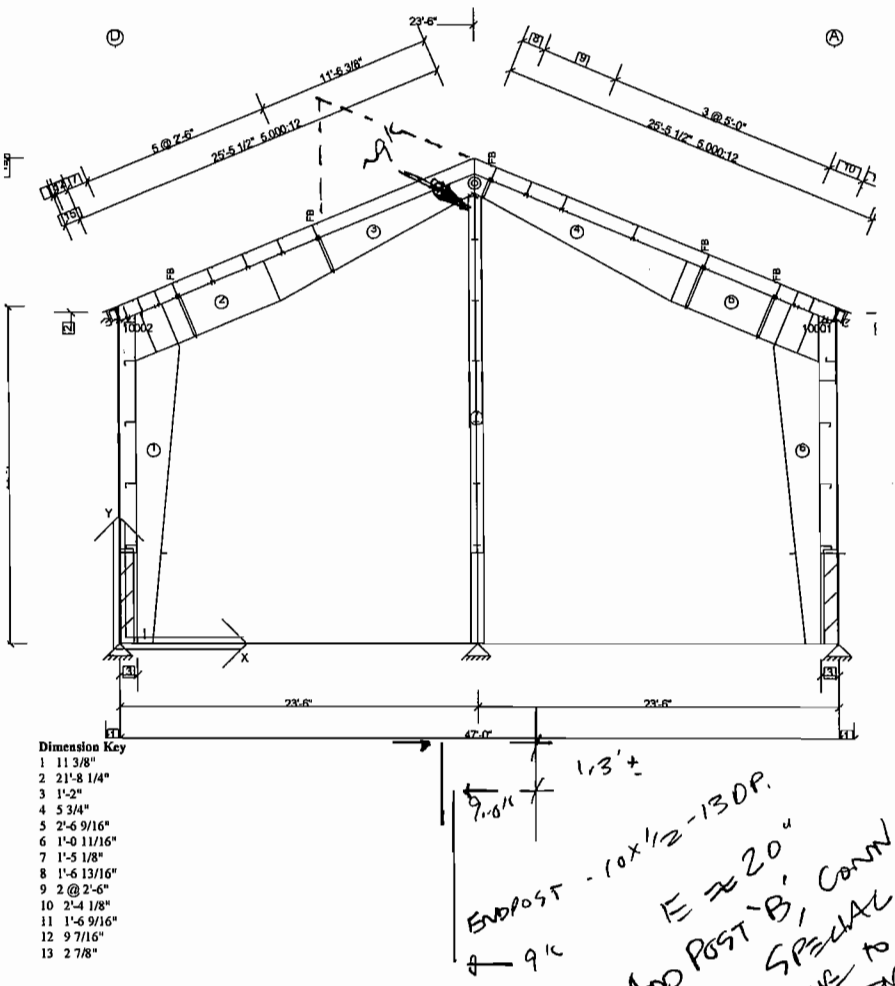
Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.





## Wall: 3, Frame at: 177.0

Frame Cross Section:




**Dimension Key**

| | |
|---|---|
| 1 | 11 3/8" |
| 2 | 21'-8 1/4" |
| 3 | 1'-2" |
| 4 | 5 3/4" |
| 5 | 2'-6 9/16" |
| 6 | 1'-0 11/16" |
| 7 | 1'-5 1/8" |
| 8 | 1'-6 13/16" |
| 9 | 2 @ 2'-6" |
| 10 | 2'-4 1/8" |
| 11 | 1'-6 9/16" |
| 12 | 9 7/16" |
| 13 | 2 7/8" |

1.3' ±
9.1 K
ENDPOST - 10x12-13DP.
E = 20"
ADD POST-B, CONN SPECIAL DUE TO CURVED TARP
R1 ~ 14.8
R2 ~ 5.7

14 31'-10 1/2" Ridge Ht.
15 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX300) and 6(CX301): 38'-9 7/8"
Vert. Clearance at member 1(CX300): 19'-5 3/16"
Vert. Clearance at member 6(CX301): 19'-5 3/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 1/7/0 | 16/3/8 | Rigid Frame with Endposts | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.50 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.50 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.2500 | 0.1644 | 12.00 | 34.00 | 21.53 | 622.0 | 55.00 | 55.00 | BP | KN | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 6.00 | 0.2500 | 0.1644 | 34.00 | 34.00 | 9.19 | 233.3 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.1875 | 0.1644 | 34.00 | 14.00 | 15.00 | 316.0 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.1875 | 0.1644 | 14.00 | 34.00 | 15.00 | 316.0 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.2500 | 0.1644 | 34.00 | 34.00 | 9.19 | 233.4 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.2500 | 0.1644 | 12.00 | 34.00 | 21.53 | 622.0 | 55.00 | 55.00 | BP | KN | 3P |
| 7 | 10.00 | 0.5000 | 0.1875 | 13.00 | 13.00 | 31.88 | 1238.3 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 3645.9 (p) (Includes all plates)
Frame Pricing Weight = 3927.7 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 7 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 7 | 23/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 23/6/0 | 31/10/8 | Yes | No | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | | Interior Column | | | Exterior Column | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 23/6/0 | | | 47/0/0 | | | |
| Grid1 - Grid2 | | -D | | | 1-B | | | -A | | | |
| Base Plate W x L (in.) | | 9 x 13 | | | 11 x 14 | | | 9 x 13 | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | 0.375 | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | 4 - 0.750 | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | 100'-0" | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | Hx | Vy | | |
| D | Frm | 0.6 | 0.1 | 5.3 | - | - | 1.3 | -0.6 | 2.7 | - | - |
| CG | Frm | 1.6 | - | 5.1 | - | - | - | -1.6 | 3.6 | - | - |
| L> | Frm | 2.2 | - | 7.8 | - | - | - | -2.2 | 8.2 | - | - |
| <L | Frm | 2.2 | - | 7.8 | - | - | - | -2.2 | 8.2 | - | - |
| S> | Frm | 0.3 | - | 0.9 | - | - | - | -0.3 | 1.0 | - | - |
| <S | Frm | 0.3 | - | 0.9 | - | - | - | -0.3 | 1.0 | - | - |
| US1* | Frm | 0.4 | - | 0.8 | - | - | - | -0.4 | 1.2 | - | - |
| *US1 | Frm | 0.2 | - | 0.8 | - | - | - | -0.2 | 0.4 | - | - |
| W1> | Frm | -7.7 | - | -10.0 | - | 9.1 | - | -4.6 | -2.8 | - | - |
| <W1 | Frm | 5.3 | - | -2.6 | - | -8.2 | - | 7.3 | -10.2 | - | - |
| W2> | Frm | -9.7 | - | -7.3 | - | - | - | -4.3 | 1.5 | - | - |
| <W2 | Frm | 3.4 | - | 0.0 | - | - | - | 7.6 | -6.0 | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - | - |
| L | Frm | 2.2 | - | 7.8 | - | - | - | -2.2 | 8.2 | - | - |
| S | Frm | 0.3 | - | 0.9 | - | - | - | -0.3 | 1.0 | - | - |
| E> | Frm | -0.5 | - | -0.4 | - | 0.3 | - | -0.5 | 0.4 | - | - |
| EG+ | Frm | 0.1 | - | 0.2 | - | - | - | -0.1 | 0.1 | - | - |
| <E | Frm | 0.5 | - | 0.4 | - | -0.3 | - | 0.5 | -0.4 | - | - |
| EG- | Frm | -0.1 | - | -0.2 | - | - | - | 0.1 | -0.1 | - | - |
| WP | Frm | 1.8 | - | -7.5 | - | - | - | -3.0 | -6.4 | - | - |
| WB1> | Brc | 0.1 | -4.4 | -13.2 | - | - | - | -0.1 | 0.1 | - | - |
| <WB1 | Brc | -0.1 | 4.4 | 13.2 | - | - | - | 0.1 | -0.1 | - | - |
| WB2> | Brc | 0.1 | -4.4 | -13.2 | - | - | - | -0.1 | 0.1 | - | - |
| <WB2 | Brc | -0.1 | 4.4 | 13.2 | - | - | - | 0.1 | -0.1 | - | - |
| EB> | Brc | 0.0 | -1.7 | -5.0 | - | - | - | -0.0 | 0.0 | - | - |
| <EB | Brc | -0.0 | 1.7 | 5.0 | - | - | - | 0.0 | -0.0 | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -D | 9.3 | 13 | 7.9 | 16 | 4.4 | 30 | 4.5 | 33 | 17.5 | 30 | 20.5 | 35 | - | - | - | - |





| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23/6/0 | 1-B | - | - | - | - | 8.2 | 8 | 9.1 | 7 | - | - | 1.3 | 1 | - | - | - | - |
| 23/6/0 | 31/10/8 | - | - | - | - | 6.1 | 8 | 6.8 | 7 | 1.3 | 1 | - | - | - | - | - | - |
| 47/0/0 | -A | 7.3 | 15 | 7.3 | 14 | - | - | - | - | 8.6 | 12 | 14.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 7.1 | 8.0 |
| CG | 0.0 | 0.0 | 8.8 | 8.8 |
| L> | 0.0 | 0.0 | 16.0 | 16.0 |
| <L | 0.0 | 0.0 | 16.0 | 16.0 |
| S> | 0.0 | 0.0 | 1.9 | 1.9 |
| <S | 0.0 | 0.0 | 1.9 | 1.9 |
| US1* | 0.0 | 0.0 | 2.0 | 2.0 |
| *US1 | 0.0 | 0.0 | 1.2 | 1.2 |
| W1> | 12.3 | 12.3 | 12.7 | 12.7 |
| <W1 | 12.7 | 12.7 | 12.8 | 12.8 |
| W2> | 14.0 | 14.0 | 5.8 | 5.8 |
| <W2 | 11.0 | 11.0 | 5.9 | 5.9 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 16.0 | 16.0 |
| S | 0.0 | 0.0 | 1.9 | 1.9 |
| E> | 1.1 | 1.1 | 0.0 | 0.0 |
| EG+ | 0.1 | 0.0 | 0.3 | 0.3 |
| <E | 1.1 | 1.1 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.3 | 0.3 |
| WP | 1.2 | 1.2 | 13.8 | 13.8 |
| WB1> | 0.0 | 0.0 | 0.0 | 13.1 |
| <WB1 | 0.0 | 0.0 | 0.0 | 13.1 |
| WB2> | 0.0 | 0.0 | 0.0 | 13.1 |
| <WB2 | 0.0 | 0.0 | 0.0 | 13.1 |
| EB> | 0.0 | 0.0 | 0.0 | 5.0 |
| <EB | 0.0 | 0.0 | 0.0 | 5.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -D | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 23/6/0 | 1-B | 7 | 0.375 | 11 | 14 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | -A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 18.44 | 33.236 | 202.17 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.3125 | 3.500 | Opposite Fillet | W-OS-0.1875 |
| 6 | 1 | S9 | 18.44 | 33.236 | 202.17 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1875 | 0.3125 | 3.500 | Opposite Fillet | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |
| 3 | 2 | SP | 0.375 | 6.00 | 15.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush (0) | 0.00 |
| 4 | 1 | SP | 0.375 | 6.00 | 15.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush (0) | 0.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |

| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 19 | -5.2 | 8.7 | 1318.1 | Thin plate | 318.1 | 1498.5 | 16 | 0.4 | 5.8 | 1311.3 | Thin plate | 318.1 | 2132.2 |
| 2 | 1 | 20 | -5.2 | 8.7 | 1318.1 | Thin plate | 318.1 | 1498.5 | 17 | 0.4 | 5.8 | 1311.3 | Thin plate | 318.1 | 2132.2 |
| 3 | 2 | 13 | 1.2 | 5.0 | 88.7 | Thin plate | 106.0 | 270.5 | 35 | 2.6 | 1.7 | 276.6 | Thin plate | 106.0 | 290.2 |
| 4 | 1 | 13 | 1.2 | 5.0 | 88.7 | Thin plate | 106.0 | 270.5 | 35 | 2.6 | 1.7 | 276.6 | Thin plate | 106.0 | 290.2 |
| 5 | 2 | 20 | -9.4 | 8.7 | 1397.6 | Thin plate | 318.1 | 1498.5 | 15 | 6.0 | 6.2 | 1071.4 | Thin plate | 318.1 | 2132.2 |
| 6 | 2 | 19 | -9.4 | 8.7 | 1397.6 | Thin plate | 318.1 | 1498.5 | 14 | 6.0 | 6.2 | 1071.4 | Thin plate | 318.1 | 2132.2 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/2/1 | 21/6/6 | FB4060 | |
| 3 | 3/10/7 | 11/6/6 | FB4020 | |
| 4 | 1/2/0 | 1/6/13 | FB2080 | |
| 5 | 1/2/0 | 16/6/13 | FB4060 | |
| 5 | 6/2/0 | 21/6/13 | FB4060 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.2 | 0.5 | -12.8 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.2 | -0.5 | -12.8 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 1 | 19.66 | 34.00 | 16 | 18 | -12.1 | -4.5 | -1340.8 | 0.0 | 57.7 | 10.6 | 1631.4 | 250.3 | 0.89 | 0.42 |
| 2 | 0.90 | 34.00 | 16 | 2 | -5.2 | 10.2 | -1318.1 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.66 | 0.96 |
| 3 | 6.07 | 25.66 | 9 | 16 | -2.4 | 7.3 | 655.4 | 0.0 | 85.1 | 14.1 | 978.4 | 105.7 | 0.68 | 0.69 |
| 4 | 14.79 | 34.00 | 9 | 17 | -6.4 | -6.3 | -833.3 | 0.0 | 31.3 | 10.5 | 943.6 | 105.7 | 0.98 | 0.60 |
| 5 | 7.31 | 34.00 | 17 | 1 | -9.4 | -9.1 | -1397.6 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.72 | 0.86 |
| 6 | 19.66 | 34.00 | 17 | 17 | -13.9 | 5.3 | -1404.5 | 0.0 | 57.7 | 10.6 | 1711.9 | 250.3 | 0.91 | 0.50 |
| 7 | 15.94 | 13.00 | 7 | 7 | -1.3 | -9.1 | -843.4 | 0.0 | 85.8 | 42.6 | 968.4 | 770.3 | 0.77 | 0.21 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.66 | 235.96 | 236.0 | 236.0 | 9.51 | 9.51 | 1654.14 | 21.35 | 97.30 | 5.34 | 113.62 | 8.23 | 0.13 | 6078.53 | 1.52 | 1.00 | 1.00 | 0.65 | 0.74 |
| 2 | 0.90 | 265.11 | 22.3 | 22.3 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.00 | 1.00 | 1.00 | 0.84 | 0.56 |
| 3 | 6.07 | 265.11 | 142.1 | 142.1 | 6.41 | 6.41 | 586.21 | 6.76 | 45.70 | 2.25 | 54.92 | 3.55 | 0.06 | 1096.08 | 1.63 | 1.00 | 1.00 | 0.65 | 0.64 |
| 4 | 14.79 | 265.11 | 180.3 | 180.3 | 7.78 | 7.78 | 1163.95 | 6.76 | 68.47 | 2.25 | 84.51 | 3.60 | 0.08 | 1932.85 | 1.57 | 1.00 | 1.00 | 0.65 | 0.76 |
| 5 | 7.31 | 265.11 | 13.7 | 13.7 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.03 | 1.00 | 1.00 | 0.84 | 0.56 |
| 6 | 19.66 | 235.96 | 236.0 | 236.0 | 9.51 | 9.51 | 1654.14 | 21.35 | 97.30 | 5.34 | 113.62 | 8.23 | 0.13 | 6078.53 | 1.60 | 1.00 | 1.00 | 0.65 | 0.74 |
| 7 | 15.94 | 382.50 | 382.5 | 382.5 | 12.25 | 12.25 | 417.83 | 83.34 | 64.28 | 16.67 | 69.25 | 25.11 | 0.86 | 3255.47 | 1.00 | 1.00 | 1.08 | 1.00 | 1.00 |



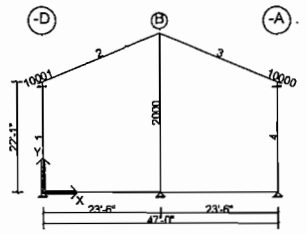


**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2221.46 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 3920.23 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -2760.49 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1078.06 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -3932.47 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 0/0/0 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 8/5/5 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 0/0/0 | -37.98 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 8/5/5 | -37.97 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 0/0/0 | -81.67 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 8/5/5 | -81.65 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.00 | 0/0/0 | 132.00 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.00 | 8/5/5 | 132.00 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.58 | 0/0/0 | 174.58 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.58 | 8/5/5 | 174.58 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.32 | 0/0/0 | 38.32 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.32 | 8/5/5 | 38.32 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 80.90 | 0/0/0 | 80.90 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 80.90 | 8/5/5 | 80.90 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 0/0/0 | 74.84 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 8/5/5 | 74.84 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 0/0/0 | 98.97 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 8/5/5 | 98.97 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 0/0/0 | 21.72 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 8/5/5 | 21.72 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 0/0/0 | 45.86 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 8/5/5 | 45.86 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/201 ) | 1.226 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1779 ) | -0.281 | 4 | 1 | 1 | L |

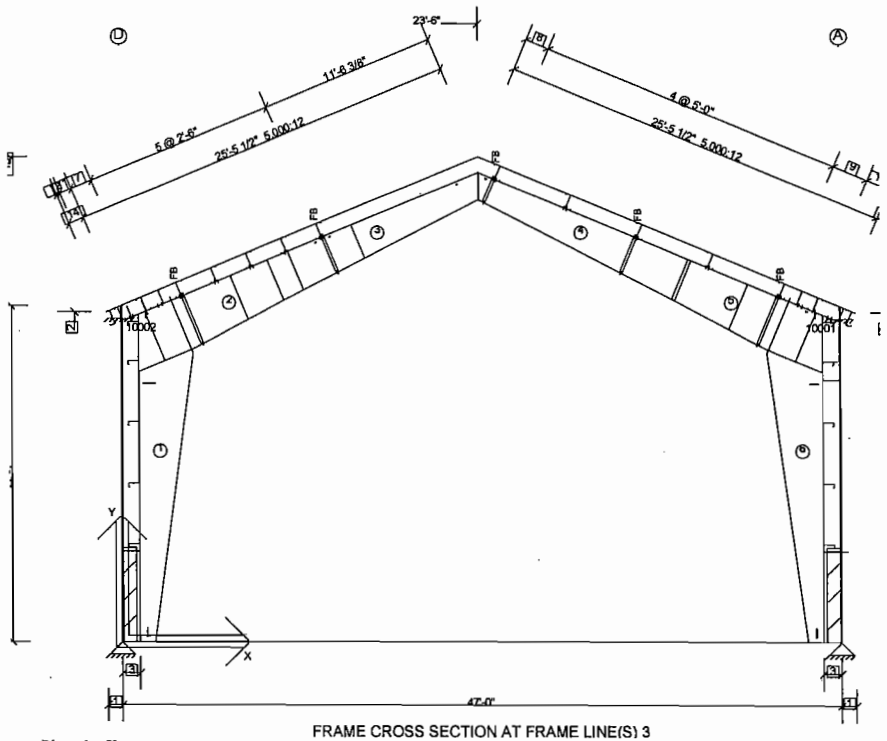
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 4, Frame at: 31/0/0**
Frame Cross Section: 3




FRAME CROSS SECTION AT FRAME LINE(S) 3

**Dimension Key**
1 11 3/8"
2 21'-8 1/4"
3 1'-2"
4 5 3/4"
5 2'-6 9/16"
6 1'-0 11/16"
7 1'-5 1/8"
8 1'-6 13/16"
9 2'-4 1/8"
10 1'-6 9/16"
11 9 7/16"
12 2 7/8"
13 31'-10 1/2" Ridge Ht.

14 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX302) and 6(CX303): 37'-5 13/16"
Vert. Clearance at member 1(CX302): 18'-11 3/4"
Vert. Clearance at member 6(CX303): 18'-11 3/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 31/0/0 | 29/8/8 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3125 | 0.1875 | 42.00 | 34.00 | 9.19 | 290.3 | 55.00 | 55.00 | KN | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 6.00 | 0.2500 | 0.1644 | 34.00 | 20.00 | 15.00 | 378.7 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1644 | 20.00 | 34.00 | 15.00 | 378.6 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3125 | 0.1875 | 34.00 | 42.00 | 9.19 | 290.3 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3191.2 (p) (Includes all plates)
Frame Pricing Weight = 3494.9 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 3**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 47/0/0 | | | | | |
| Grid1 - Grid2 | | 3-D | | | 3-A | | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.0 | -0.1 | 6.7 | -1.0 | -0.1 | 6.1 | - | - | - |
| CG | Frm | 2.9 | - | 9.2 | -2.9 | - | 6.4 | - | - | - |
| L> | Frm | 3.9 | - | 13.5 | -3.9 | - | 14.1 | - | - | - |
| <L | Frm | 3.9 | - | 13.5 | -3.9 | - | 14.1 | - | - | - |
| S> | Frm | 0.4 | - | 1.6 | -0.4 | - | 1.6 | - | - | - |
| <S | Frm | 0.4 | - | 1.6 | -0.4 | - | 1.6 | - | - | - |
| US1* | Frm | 0.7 | - | 1.4 | -0.7 | - | 2.1 | - | - | - |
| *US1 | Frm | 0.3 | - | 1.3 | -0.3 | - | 0.7 | - | - | - |
| W1> | Frm | -14.0 | - | -17.3 | -8.5 | - | -4.4 | - | - | - |
| <W1 | Frm | 10.0 | - | -4.0 | 13.4 | - | -17.7 | - | - | - |
| W2> | Frm | -17.5 | - | -12.4 | -8.1 | - | 3.3 | - | - | - |
| <W2 | Frm | 6.6 | - | 0.9 | 13.8 | - | -10.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 3.9 | - | 13.5 | -3.9 | - | 14.1 | - | - | - |
| S | Frm | 0.4 | - | 1.6 | -0.4 | - | 1.6 | - | - | - |
| E> | Frm | -1.0 | - | -0.8 | -0.9 | - | 0.7 | - | - | - |
| EG+ | Frm | 0.1 | - | 0.3 | -0.1 | - | 0.3 | - | - | - |
| <E | Frm | 1.0 | - | 0.8 | 0.9 | - | -0.7 | - | - | - |
| EG- | Frm | -0.1 | - | -0.3 | 0.1 | - | -0.3 | - | - | - |
| WP | Frm | 4.2 | - | -9.8 | -5.8 | - | -8.3 | - | - | - |
| WB1> | Brc | -0.0 | -4.2 | 13.2 | 0.0 | 1.5 | -6.9 | - | - | - |
| <WB1 | Brc | 0.0 | 4.2 | -13.2 | -0.0 | -1.6 | 6.9 | - | - | - |
| WB2> | Brc | -0.0 | -4.2 | 13.2 | 0.0 | 1.5 | -7.0 | - | - | - |
| <WB2 | Brc | 0.0 | 4.2 | -13.2 | -0.0 | -1.6 | 6.9 | - | - | - |
| EB> | Brc | -0.0 | -1.6 | 5.0 | 0.0 | 0.5 | -2.3 | - | - | - |
| <EB | Brc | 0.0 | 1.6 | -5.0 | -0.0 | -0.5 | 2.3 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3-D | 16.9 | 13 | 14.3 | 16 | 4.2 | 29 | 4.1 | 34 | 19.0 | 34 | 29.4 | 1 | - | - | - | - |
| 47/0/0 | 3-A | 13.1 | 15 | 13.3 | 14 | 1.6 | 41 | 1.5 | 38 | 14.1 | 12 | 26.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.1 | 12.8 |
| CG | 0.0 | 0.0 | 15.5 | 15.5 |





| | | | | |
|---|---|---|---|---|
| L> | 0.0 | 0.0 | 27.5 | 27.5 |
| <L | 0.0 | 0.0 | 27.5 | 27.5 |
| S> | 0.0 | 0.0 | 3.2 | 3.2 |
| <S | 0.0 | 0.0 | 3.2 | 3.2 |
| US1* | 0.0 | 0.0 | 3.5 | 3.5 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 22.5 | 22.5 | 21.7 | 21.7 |
| <W1 | 23.5 | 23.5 | 21.7 | 21.7 |
| W2> | 25.6 | 25.6 | 9.1 | 9.1 |
| <W2 | 20.4 | 20.4 | 9.1 | 9.1 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 27.5 | 27.5 |
| S | 0.0 | 0.0 | 3.2 | 3.2 |
| E> | 1.9 | 1.9 | 0.0 | 0.0 |
| EG+ | 0.1 | 0.0 | 0.6 | 0.6 |
| <E | 1.9 | 1.9 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.6 | 0.6 |
| WP | 1.6 | 1.6 | 18.1 | 18.1 |
| WB1> | 0.0 | 0.0 | 0.0 | 6.3 |
| <WB1 | 0.0 | 0.0 | 0.0 | 6.3 |
| WB2> | 0.0 | 0.0 | 0.0 | 6.3 |
| <WB2 | 0.0 | 0.0 | 0.0 | 6.3 |
| EB> | 0.0 | 0.0 | 0.0 | 2.7 |
| <EB | 0.0 | 0.0 | 0.0 | 2.7 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3-D | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | 3-A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.22 | 36.458 | 194.44 | 1.25 | 45.57 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 1.51 | 32.075 | 195.10 | 1.50 | 48.11 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 3 | 2 | S1 | 6.02 | 27.664 | 168.27 | 1.75 | 48.41 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 4 | 1 | S1 | 14.74 | 33.296 | 202.53 | 1.50 | 49.94 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 5 | 1 | S1 | 3.97 | 38.009 | 202.72 | 1.50 | 57.01 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 4 | 1 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | | |
| 1 | 2 | 16 | -9.9 | 14.8 | 2250.7 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.2 | 2318.3 | Thin plate | 159.0 | 2591.4 | | |
| 2 | 1 | 16 | -9.9 | 14.8 | 2250.7 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.2 | 2318.3 | Thin plate | 159.0 | 2591.4 | | |
| 3 | 2 | 14 | 1.7 | 9.3 | 165.5 | Thin plate | 212.1 | 623.8 | 30 | 8.8 | 1.6 | 451.1 | Thin plate | 318.1 | 922.5 | | |
| 4 | 1 | 15 | 1.7 | 9.3 | 165.5 | Thin plate | 212.1 | 623.8 | 31 | 8.8 | 1.6 | 451.1 | Thin plate | 318.1 | 922.5 | | |
| 5 | 2 | 17 | -17.4 | 14.1 | 2380.9 | Thin plate | 159.0 | 2580.7 | 12 | 11.4 | 10.3 | 1897.1 | Thin plate | 159.0 | 2580.7 | | |
| 6 | 2 | 17 | -17.4 | 14.1 | 2380.9 | Thin plate | 159.0 | 2580.7 | 12 | 11.4 | 10.3 | 1897.1 | Thin plate | 159.0 | 2580.7 | | |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/12 | 21/6/6 | FB4110 | |
| 3 | 3/10/7 | 11/6/6 | FB4030 | |
| 4 | 1/2/0 | 1/6/13 | FB3000 | |
| 4 | 11/2/0 | 11/6/13 | FB4030 | |
| 5 | 6/2/0 | 21/6/13 | FB4110 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.4 | 0.9 | -21.8 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.4 | -0.9 | -21.8 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 1 | 19.24 | 42.00 | 16 | 18 | -21.2 | -7.8 | -2299.5 | 0.0 | 90.5 | 12.8 | 3066.1 | 343.3 | 0.80 | 0.61 |
| 2 | 1.11 | 42.00 | 16 | 18 | -9.9 | 14.2 | -2250.7 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.67 | 1.01 |
| 3 | 0.00 | 34.00 | 9 | 16 | -5.1 | 13.0 | 1507.7 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.76 | 1.00 |
| 4 | 14.67 | 34.00 | 9 | 17 | -11.6 | -10.5 | -1545.0 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.80 | 0.94 |
| 5 | 6.87 | 42.00 | 17 | 17 | -17.4 | -12.7 | -2380.9 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.72 | 0.90 |
| 6 | 19.24 | 42.00 | 17 | 17 | -24.4 | 9.1 | -2389.8 | 0.0 | 90.5 | 12.8 | 3209.6 | 343.3 | 0.82 | 0.71 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.52 | 1.00 | 1.00 | 0.90 | 0.68 |
| 2 | 1.11 | 258.48 | 27.0 | 27.0 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.00 | 1.00 | 1.00 | 0.96 | 0.52 |
| 3 | 0.00 | 258.48 | 120.1 | 30.0 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.11 | 1.00 | 1.00 | 0.84 | 0.56 |
| 4 | 14.67 | 258.48 | 120.1 | 120.1 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.22 | 1.00 | 1.00 | 0.84 | 0.56 |
| 5 | 6.87 | 258.48 | 8.3 | 8.3 | 11.51 | 11.51 | 2735.96 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.55 | 1.02 | 1.00 | 1.00 | 0.96 | 0.52 |
| 6 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.60 | 1.00 | 1.00 | 0.90 | 0.68 |



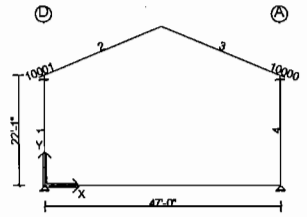


**User Defined Frame Point Loads for Cross Section: 3**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4040.33 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7130.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5020.71 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1960.75 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7130.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 3**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -53.47 | 0/0/0 | -53.47 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.07 | 0/0/0 | -69.07 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -148.54 | 0/0/0 | -148.54 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 24.90 | 0/0/0 | 24.90 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 32.94 | 0/0/0 | 32.94 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 7.23 | 0/0/0 | 7.23 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 15.26 | 0/0/0 | 15.26 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 351.60 | 0/0/0 | 351.60 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 465.01 | 0/0/0 | 465.01 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 102.06 | 0/0/0 | 102.06 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 215.47 | 0/0/0 | 215.47 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 3**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/207 ) | 1.178 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1977 ) | 0.249 | 5 | 1 | 7 | W2> |

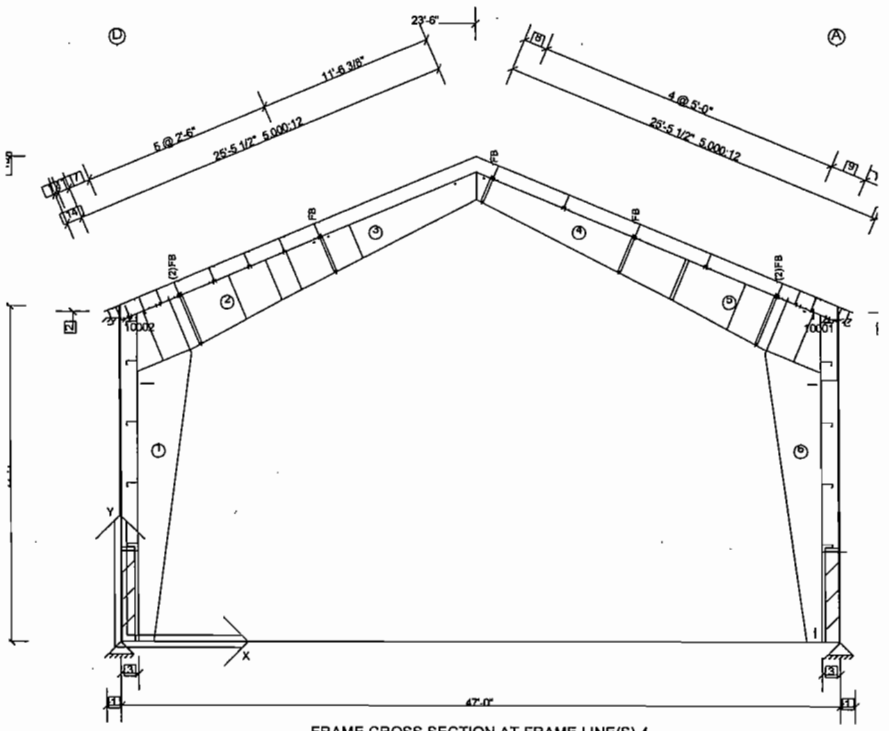
- Negative horizontal deflection is left
- Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 4, Frame at: 61/0/0**
Frame Cross Section: 4




FRAME CROSS SECTION AT FRAME LINE(S) 4

**Dimension Key**
1 11 3/8"
2 21'-8 1/4"
3 1'-2"
4 5 3/4"
5 2'-6 9/16"
6 1'-0 11/16"
7 1'-5 1/8"
8 1'-6 13/16"
9 2'-4 1/8"
10 1'-6 9/16"
11 9 7/16"
12 2 7/8"
13 31'-10 1/2" Ridge Ht.

14 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX304) and 6(CX305): 37'-5 13/16"
Vert. Clearance at member 1(CX304): 18'-11 3/4"
Vert. Clearance at member 6(CX305): 18'-11 3/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 61/0/0 | 30/0/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3125 | 0.1875 | 42.00 | 34.00 | 9.19 | 290.3 | 55.00 | 55.00 | KN | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 6.00 | 0.2500 | 0.1644 | 34.00 | 20.00 | 15.00 | 378.7 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1644 | 20.00 | 34.00 | 15.00 | 378.6 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3125 | 0.1875 | 34.00 | 42.00 | 9.19 | 290.3 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3191.2 (p) (Includes all plates)
Frame Pricing Weight = 3502.3 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 4**

| Type | | Exterior Column | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | | |
| Grid1 - Grid2 | | 4-D | | 4-A | | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.0 | 4.4 | -1.0 | 0.1 | 6.7 | - | - | - |
| CG | Frm | 2.9 | 9.2 | -2.9 | - | 6.5 | - | - | - |
| L> | Frm | 3.9 | 13.6 | -3.9 | - | 14.2 | - | - | - |
| <L | Frm | 3.9 | 13.6 | -3.9 | - | 14.2 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | - | 1.7 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | - | 1.7 | - | - | - |
| US1* | Frm | 0.7 | 1.4 | -0.7 | - | 2.1 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | - | 0.7 | - | - | - |
| W1> | Frm | -14.1 | -17.4 | -8.6 | - | -4.5 | - | - | - |
| <W1 | Frm | 10.1 | -4.0 | 13.6 | - | -17.9 | - | - | - |
| W2> | Frm | -17.6 | -12.6 | -8.2 | - | 3.3 | - | - | - |
| <W2 | Frm | 6.6 | 0.9 | 14.0 | - | -10.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - |
| L | Frm | 3.9 | 13.6 | -3.9 | - | 14.2 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | - | 1.7 | - | - | - |
| E> | Frm | -1.0 | -0.8 | -1.0 | - | 0.8 | - | - | - |
| EG+ | Frm | 0.1 | 0.4 | -0.1 | - | 0.3 | - | - | - |
| <E | Frm | 1.0 | 0.8 | 1.0 | - | -0.8 | - | - | - |
| EG- | Frm | -0.1 | -0.4 | 0.1 | - | -0.3 | - | - | - |
| WP | Frm | 4.4 | -9.5 | -5.9 | - | -8.1 | - | - | - |
| WB1> | Brc | -0.0 | -0.0 | 0.0 | 3.3 | 6.9 | - | - | - |
| <WB1 | Brc | 0.0 | 0.0 | -0.0 | -3.2 | -6.9 | - | - | - |
| WB2> | Brc | -0.0 | -0.0 | 0.0 | 3.3 | 6.9 | - | - | - |
| <WB2 | Brc | 0.0 | 0.0 | -0.0 | -3.2 | -6.9 | - | - | - |
| EB> | Brc | -0.0 | -0.0 | 0.0 | 1.1 | 2.3 | - | - | - |
| <EB | Brc | 0.0 | 0.0 | -0.0 | -1.1 | -2.3 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 4-D | 17.1 | 13 | 14.4 | 16 | - | - | - | - | 14.8 | 11 | 27.3 | 1 | - | - | - | - |
| 47/0/0 | 4-A | 13.3 | 15 | 13.4 | 14 | 3.2 | 42 | 3.3 | 37 | 13.9 | 12 | 27.4 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.2 | 11.1 |
| CG | 0.0 | 0.0 | 15.7 | 15.7 |





| | | | | |
|---|---|---|---|---|
| L> | 0.0 | 0.0 | 27.8 | 27.8 |
| <L | 0.0 | 0.0 | 27.8 | 27.8 |
| S> | 0.0 | 0.0 | 3.2 | 3.2 |
| <S | 0.0 | 0.0 | 3.2 | 3.2 |
| US1* | 0.0 | 0.0 | 3.6 | 3.6 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 22.7 | 22.7 | 21.9 | 21.9 |
| <W1 | 23.7 | 23.7 | 21.9 | 21.9 |
| W2> | 25.8 | 25.8 | 9.2 | 9.2 |
| <W2 | 20.6 | 20.6 | 9.2 | 9.2 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 27.8 | 27.8 |
| S | 0.0 | 0.0 | 3.2 | 3.2 |
| E> | 1.9 | 1.9 | 0.0 | 0.0 |
| EG+ | 0.1 | 0.0 | 0.6 | 0.6 |
| <E | 1.9 | 1.9 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.6 | 0.6 |
| WP | 1.5 | 1.5 | 17.6 | 17.6 |
| WB1> | 0.0 | 0.0 | 0.0 | 6.8 |
| <WB1 | 0.0 | 0.0 | 0.0 | 6.8 |
| WB2> | 0.0 | 0.0 | 0.0 | 6.8 |
| <WB2 | 0.0 | 0.0 | 0.0 | 6.8 |
| EB> | 0.0 | 0.0 | 0.0 | 2.3 |
| <EB | 0.0 | 0.0 | 0.0 | 2.3 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 4-D | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | 4-A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.22 | 36.458 | 194.44 | 1.25 | 45.57 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 1.51 | 32.075 | 195.10 | 1.50 | 48.11 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 3 | 2 | S1 | 6.02 | 27.664 | 168.27 | 1.75 | 48.41 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 4 | 1 | S1 | 14.74 | 33.296 | 202.53 | 1.50 | 49.94 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 5 | 1 | S1 | 3.97 | 38.009 | 202.72 | 1.50 | 57.01 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 4 | 1 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 16 | -10.0 | 14.9 | 2268.2 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.3 | 2343.9 | Thin plate | 159.0 | 2591.4 |
| 2 | 1 | 16 | -10.0 | 14.9 | 2268.2 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.3 | 2343.9 | Thin plate | 159.0 | 2591.4 |
| 3 | 2 | 14 | 1.7 | 9.4 | 167.3 | Thin plate | 212.1 | 623.8 | 30 | 8.7 | 1.8 | 455.9 | Thin plate | 318.1 | 922.5 |
| 4 | 1 | 15 | 1.7 | 9.4 | 167.3 | Thin plate | 212.1 | 623.8 | 31 | 8.7 | 1.8 | 455.9 | Thin plate | 318.1 | 922.5 |
| 5 | 2 | 17 | -17.6 | 14.2 | 2408.7 | Thin plate | 159.0 | 2580.7 | 12 | 11.5 | 10.4 | 1914.1 | Thin plate | 159.0 | 2580.7 |
| 6 | 2 | 17 | -17.6 | 14.2 | 2408.7 | Thin plate | 159.0 | 2580.7 | 12 | 11.5 | 10.4 | 1914.1 | Thin plate | 159.0 | 2580.7 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/12 | 21/6/6 | (2)FB4110 | |
| 3 | 3/10/7 | 11/6/6 | FB4030 | |
| 4 | 1/2/0 | 1/6/13 | FB3000 | |
| 4 | 11/2/0 | 11/6/13 | FB4030 | |
| 5 | 6/2/0 | 21/6/13 | (2)FB4110 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.4 | 0.9 | -22.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.4 | -0.9 | -22.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 1 | 19.24 | 42.00 | 16 | 18 | -21.4 | -7.9 | -2317.0 | 0.0 | 90.5 | 12.8 | 3070.8 | 343.3 | 0.81 | 0.62 |
| 2 | 1.11 | 42.00 | 16 | 18 | -10.0 | 14.3 | -2268.2 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.67 | 1.02 |
| 3 | 0.00 | 34.00 | 9 | 16 | -5.1 | 13.1 | 1525.7 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.77 | 1.01 |
| 4 | 14.67 | 34.00 | 9 | 17 | -11.7 | -10.6 | -1563.3 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.81 | 0.95 |
| 5 | 6.87 | 42.00 | 17 | 17 | -17.6 | -12.8 | -2408.7 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.73 | 0.91 |
| 6 | 19.24 | 42.00 | 17 | 17 | -24.7 | 9.2 | -2417.8 | 0.0 | 90.5 | 12.8 | 3207.5 | 343.3 | 0.84 | 0.72 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.52 | 1.00 | 1.00 | 0.90 | 0.68 |
| 2 | 1.11 | 258.48 | 27.0 | 27.0 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.00 | 1.00 | 1.00 | 0.96 | 0.52 |
| 3 | 0.00 | 258.48 | 120.1 | 30.0 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.11 | 1.00 | 1.00 | 0.84 | 0.56 |
| 4 | 14.67 | 258.48 | 120.1 | 120.1 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.22 | 1.00 | 1.00 | 0.84 | 0.56 |
| 5 | 6.87 | 258.48 | 8.3 | 8.3 | 11.51 | 11.51 | 2735.96 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.55 | 1.02 | 1.00 | 1.00 | 0.96 | 0.52 |
| 6 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.60 | 1.00 | 1.00 | 0.90 | 0.68 |



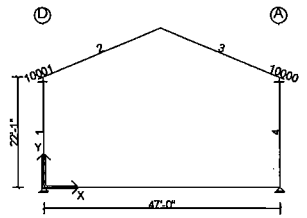


**User Defined Frame Point Loads for Cross Section: 4**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4080.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7200.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5070.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1980.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7200.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 4**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -54.00 | 0/0/0 | -54.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.75 | 0/0/0 | -69.75 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -150.00 | 0/0/0 | -150.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 380.34 | 0/0/0 | 380.34 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 503.03 | 0/0/0 | 503.03 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 110.41 | 0/0/0 | 110.41 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 233.09 | 0/0/0 | 233.09 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 4**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/205 ) | 1.189 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1958 ) | 0.251 | 4 | 2 | 7 | W2> |

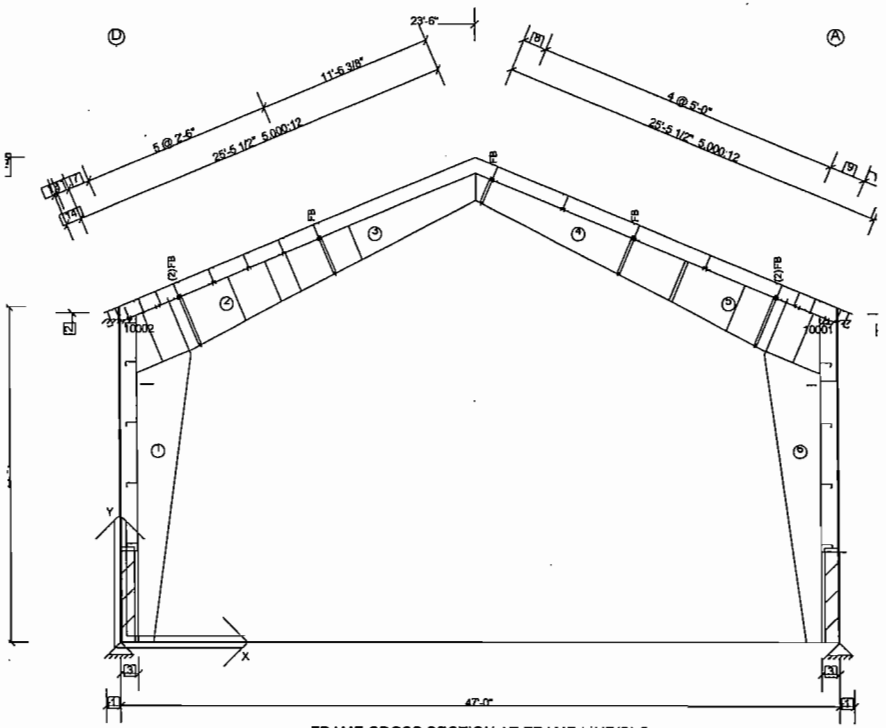
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 4, Frame at: 91/0/0**
Frame Cross Section: 5




FRAME CROSS SECTION AT FRAME LINE(S) 5

**Dimension Key**
1 11 3/8"
2 21'-8 1/4"
3 1'-2"
4 5 3/4"
5 2'-6 9/16"
6 1'-0 11/16"
7 1'-5 1/8"
8 1'-6 13/16"
9 2'-4 1/8"
10 1'-6 9/16"
11 9 7/16"
12 2 7/8"
13 31'-10 1/2" Ridge Ht.

14 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX306) and 6(CX307): 37'-5 13/16"
Vert. Clearance at member 1(CX306): 18'-11 3/4"
Vert. Clearance at member 6(CX307): 18'-11 3/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 91/0/0 | 30/0/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 29 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 31 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -7.17 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -7.17 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3125 | 0.1875 | 42.00 | 34.00 | 9.19 | 290.3 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.2500 | 0.1644 | 34.00 | 20.00 | 15.00 | 378.7 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1644 | 20.00 | 34.00 | 15.00 | 378.6 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3125 | 0.1875 | 34.00 | 42.00 | 9.19 | 290.3 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3191.2 (p) (Includes all plates)
Frame Pricing Weight = 3501.2 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.
**Reactions - Unfactored Load Type at Frame Cross Section: 5**

| Type | Exterior Column | Exterior Column | | | |
|---|---|---|---|---|---|
| X-Loc | 0/0/0 | 47/0/0 | | | |
| Grid1 - Grid2 | 5-D | 5-A | | | |

| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | |
|---|---|---|---|---|---|---|---|---|
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 1.0 | 4.4 | -1.0 | 4.3 | - | - | - |
| CG | Frm | 2.9 | 9.2 | -2.9 | 6.5 | - | - | - |
| L> | Frm | 3.9 | 13.6 | -3.9 | 14.2 | - | - | - |
| <L | Frm | 3.9 | 13.6 | -3.9 | 14.2 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | 1.7 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | 1.7 | - | - | - |
| US1* | Frm | 0.7 | 1.4 | -0.7 | 2.1 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | 0.7 | - | - | - |
| W1> | Frm | -14.1 | -17.4 | -8.6 | -4.5 | - | - | - |
| <W1 | Frm | 10.1 | -4.0 | 13.6 | -17.9 | - | - | - |
| W2> | Frm | -17.6 | -12.6 | -8.2 | 3.3 | - | - | - |
| <W2 | Frm | 6.6 | 0.9 | 14.0 | -10.1 | - | - | - |
| WP | Frm | 4.4 | -9.5 | -5.9 | -8.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 3.9 | 13.6 | -3.9 | 14.2 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | 1.7 | - | - | - |
| E> | Frm | -1.0 | -0.8 | -1.0 | 0.8 | - | - | - |
| EG+ | Frm | 0.1 | 0.4 | -0.1 | 0.3 | - | - | - |
| <E | Frm | 1.0 | 0.8 | 1.0 | -0.8 | - | - | - |
| EG- | Frm | -0.1 | -0.4 | 0.1 | -0.3 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5-D | 17.0 | 14 | 14.4 | 18 | - | - | - | - | 14.8 | 12 | 27.3 | 1 | - | - | - | - |
| 47/0/0 | 5-A | 13.3 | 17 | 13.4 | 15 | - | - | - | - | 15.3 | 13 | 25.0 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.2 | 8.7 |
| CG | 0.0 | 0.0 | 15.7 | 15.7 |
| L> | 0.0 | 0.0 | 27.8 | 27.8 |
| <L | 0.0 | 0.0 | 27.8 | 27.8 |
| S> | 0.0 | 0.0 | 3.2 | 3.2 |
| <S | 0.0 | 0.0 | 3.2 | 3.2 |
| US1* | 0.0 | 0.0 | 3.6 | 3.6 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 22.7 | 22.7 | 21.9 | 21.9 |
| <W1 | 23.7 | 23.7 | 21.9 | 21.9 |
| W2> | 25.8 | 25.8 | 9.2 | 9.2 |
| <W2 | 20.6 | 20.6 | 9.2 | 9.2 |
| WP | 1.5 | 1.5 | 17.6 | 17.6 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 27.8 | 27.8 |
| S | 0.0 | 0.0 | 3.2 | 3.2 |
| E> | 1.9 | 1.9 | 0.0 | 0.0 |
| EG+ | 0.1 | 0.0 | 0.6 | 0.6 |
| <E | 1.9 | 1.9 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.6 | 0.6 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5-D | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | 5-A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |





**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.22 | 36.458 | 194.44 | 1.25 | 45.57 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 1.51 | 32.075 | 195.10 | 1.50 | 48.11 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 3 | 2 | S1 | 6.02 | 27.664 | 168.27 | 1.75 | 48.41 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 4 | 1 | S1 | 14.74 | 33.296 | 202.53 | 1.50 | 49.94 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 5 | 1 | S1 | 3.97 | 38.009 | 202.72 | 1.50 | 57.01 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint. | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 4 | 1 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | | |
| 1 | 2 | 18 | -10.0 | 14.9 | 2270.0 | Thin plate | 159.0 | 2591.4 | 14 | 1.1 | 10.3 | 2341.3 | Thin plate | 159.0 | 2591.4 | | |
| 2 | 1 | 18 | -10.0 | 14.9 | 2270.0 | Thin plate | 159.0 | 2591.4 | 14 | 1.1 | 10.3 | 2341.3 | Thin plate | 159.0 | 2591.4 | | |
| 3 | 2 | 15 | 1.7 | 9.4 | 168.2 | Thin plate | 212.1 | 623.8 | 12 | 8.7 | 1.8 | 451.4 | Thin plate | 318.1 | 922.5 | | |
| 4 | 1 | 16 | 1.7 | 9.4 | 168.2 | Thin plate | 212.1 | 623.8 | 13 | 8.7 | 1.8 | 451.4 | Thin plate | 318.1 | 922.5 | | |
| 5 | 2 | 19 | -17.6 | 14.2 | 2402.5 | Thin plate | 159.0 | 2580.7 | 13 | 11.5 | 10.4 | 1915.2 | Thin plate | 159.0 | 2580.7 | | |
| 6 | 2 | 19 | -17.6 | 14.2 | 2402.5 | Thin plate | 159.0 | 2580.7 | 13 | 11.5 | 10.4 | 1915.2 | Thin plate | 159.0 | 2580.7 | | |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/12 | 21/6/6 | (2)FB4110 | |
| 3 | 3/10/7 | 11/6/6 | FB4030 | |
| 4 | 1/2/0 | 1/6/13 | FB3000 | |
| 4 | 11/2/0 | 11/6/13 | FB4030 | |
| 5 | 6/2/0 | 21/6/13 | (2)FB4110 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases: Axial + Flexure | Controlling Cases: Shear | Required Strength: Axial Pr k | Required Strength: Shear Vr k | Required Strength: Mom-x Mrx in-k | Required Strength: Mom-y Mry in-k | Available Strength: Axial Pc k | Available Strength: Shear Vc k | Available Strength: Mom-x Mcx in-k | Available Strength: Mom-y Mcy in-k | Strength Ratios: Axial + Flexure | Strength Ratios: Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.4 | 0.9 | -22.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.4 | -0.9 | -22.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 1 | 19.24 | 42.00 | 18 | 20 | -21.4 | -7.9 | -2318.8 | 0.0 | 90.5 | 12.8 | 3071.0 | 343.3 | 0.81 | 0.62 |
| 2 | 1.11 | 42.00 | 18 | 20 | -10.0 | 14.3 | -2270.0 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.67 | 1.02 |
| 3 | 0.00 | 34.00 | 9 | 18 | -5.2 | 13.1 | 1522.1 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.76 | 1.01 |
| 4 | 14.67 | 34.00 | 9 | 19 | -11.7 | -10.6 | -1559.4 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.81 | 0.94 |
| 5 | 6.87 | 42.00 | 19 | 19 | -17.6 | -12.8 | -2402.5 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.73 | 0.91 |
| 6 | 19.24 | 42.00 | 19 | 19 | -24.7 | 9.2 | -2410.9 | 0.0 | 90.5 | 12.8 | 3215.6 | 343.3 | 0.83 | 0.72 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.52 | 1.00 | 1.00 | 0.90 | 0.68 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1.11 | 258.48 | 27.0 | 27.0 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.00 | 1.00 | 1.00 | 0.96 | 0.52 |
| 3 | 0.00 | 258.48 | 120.1 | 30.0 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.11 | 1.00 | 1.00 | 0.84 | 0.56 |
| 4 | 14.67 | 258.48 | 120.1 | 120.1 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.22 | 1.00 | 1.00 | 0.84 | 0.56 |
| 5 | 6.87 | 258.48 | 8.3 | 8.3 | 11.51 | 11.51 | 2735.96 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.56 | 1.02 | 1.00 | 1.00 | 0.96 | 0.52 |
| 6 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.60 | 1.00 | 1.00 | 0.90 | 0.68 |



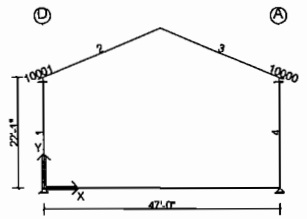


**User Defined Frame Point Loads for Cross Section: 5**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4080.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7200.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5070.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1980.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7200.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 5**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -54.00 | 0/0/0 | -54.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.75 | 0/0/0 | -69.75 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -150.00 | 0/0/0 | -150.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 380.34 | 0/0/0 | 380.34 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 503.03 | 0/0/0 | 503.03 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 110.41 | 0/0/0 | 110.41 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 233.09 | 0/0/0 | 233.09 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 12 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 15 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 16 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 5**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/205 ) | 1.190 | 1 | 2 | 12 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1958 ) | 0.251 | 4 | 2 | 7 | W2> |

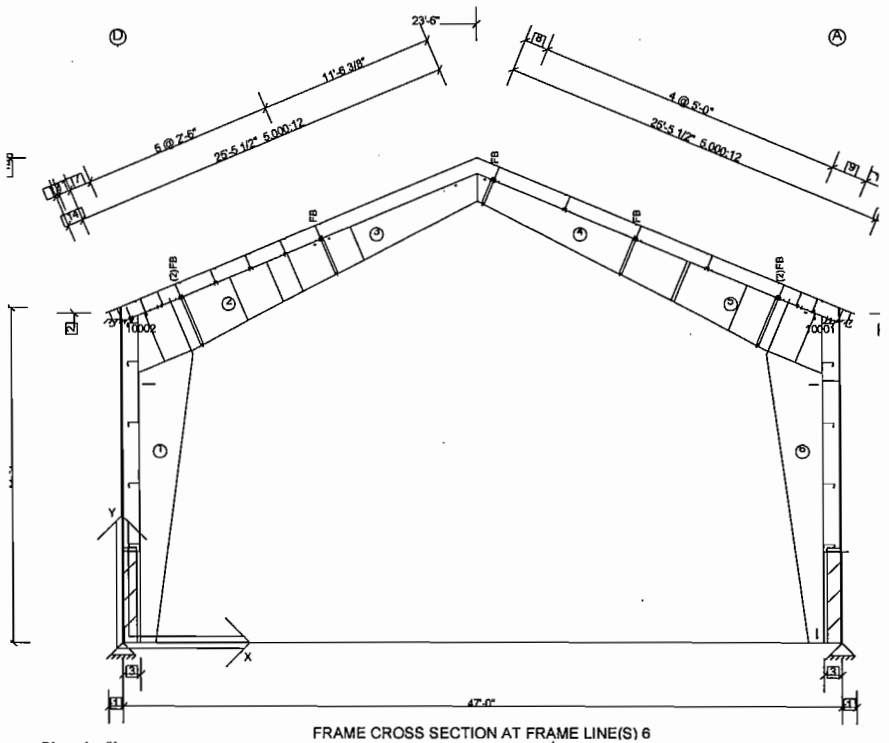
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 4, Frame at: 121/0/0**
Frame Cross Section: 6




FRAME CROSS SECTION AT FRAME LINE(S) 6

**Dimension Key**
1 11 3/8"
2 21'-8 1/4"
3 1'-2"
4 5 3/4"
5 2'-6 9/16"
6 1'-0 11/16"
7 1'-5 1/8"
8 1'-6 13/16"
9 2'-4 1/8"
10 1'-6 9/16"
11 9 7/16"
12 2 7/8"
13 31'-10 1/2" Ridge Ht.

14 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX308) and 6(CX309): 37'-5 13/16"
Vert. Clearance at member 1(CX308): 18'-11 3/4"
Vert. Clearance at member 6(CX309): 18'-11 3/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 121/0/0 | 30/0/0 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |
| 2, | 6.00 | 0.3125 | 0.1875 | 42.00 | 34.00 | 9.19 | 290.3 | 55.00 | 55.00 | KN | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 6.00 | 0.2500 | 0.1644 | 34.00 | 20.00 | 15.00 | 378.7 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1644 | 20.00 | 34.00 | 15.00 | 378.6 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3125 | 0.1875 | 34.00 | 42.00 | 9.19 | 290.3 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3191.2 (p) (Includes all plates)
Frame Pricing Weight = 3502.3 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 6**

| Type | | Exterior Column | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | | |
| Grid1 - Grid2 | | 6-D | | 6-A | | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.0 | 4.4 | -1.0 | -0.1 | 6.7 | - | - | - |
| CG | Frm | 2.9 | 9.2 | -2.9 | - | 6.5 | - | - | - |
| L> | Frm | 3.9 | 13.6 | -3.9 | - | 14.2 | - | - | - |
| <L | Frm | 3.9 | 13.6 | -3.9 | - | 14.2 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | - | 1.7 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | - | 1.7 | - | - | - |
| US1* | Frm | 0.7 | 1.4 | -0.7 | - | 2.1 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | - | 0.7 | - | - | - |
| W1> | Frm | -14.1 | -17.4 | -8.6 | - | -4.5 | - | - | - |
| <W1 | Frm | 10.1 | -4.0 | 13.6 | - | -17.9 | - | - | - |
| W2> | Frm | -17.6 | -12.6 | -8.2 | - | 3.3 | - | - | - |
| <W2 | Frm | 6.6 | 0.9 | 14.0 | - | -10.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - |
| L | Frm | 3.9 | 13.6 | -3.9 | - | 14.2 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | - | 1.7 | - | - | - |
| E> | Frm | -1.0 | -0.8 | -1.0 | - | 0.8 | - | - | - |
| EG+ | Frm | 0.1 | 0.4 | -0.1 | - | 0.3 | - | - | - |
| <E | Frm | 1.0 | 0.8 | 1.0 | - | -0.8 | - | - | - |
| EG- | Frm | -0.1 | -0.4 | 0.1 | - | -0.3 | - | - | - |
| WP | Frm | 4.4 | -9.5 | -5.9 | - | -8.1 | - | - | - |
| WB1> | Brc | 0.0 | 0.0 | -0.0 | 2.8 | -6.0 | - | - | - |
| <WB1 | Brc | -0.0 | -0.0 | 0.0 | -2.9 | 6.0 | - | - | - |
| WB2> | Brc | 0.0 | 0.0 | -0.0 | 2.8 | -6.0 | - | - | - |
| <WB2 | Brc | -0.0 | -0.0 | 0.0 | -2.9 | 6.0 | - | - | - |
| EB> | Brc | - | - | - | 0.9 | -2.0 | - | - | - |
| <EB | Brc | - | - | - | -1.0 | 2.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 6-D | 17.1 | 13 | 14.4 | 16 | - | - | - | - | 14.8 | 11 | 27.3 | 1 | - | - | - | - |
| 47/0/0 | 6-A | 13.3 | 15 | 13.4 | 14 | 2.9 | 41 | 2.8 | 38 | 13.9 | 12 | 27.4 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.2 | 11.1 |
| CG | 0.0 | 0.0 | 15.7 | 15.7 |





| | | | | |
|---|---|---|---|---|
| L> | 0.0 | 0.0 | 27.8 | 27.8 |
| <L | 0.0 | 0.0 | 27.8 | 27.8 |
| S> | 0.0 | 0.0 | 3.2 | 3.2 |
| <S | 0.0 | 0.0 | 3.2 | 3.2 |
| US1* | 0.0 | 0.0 | 3.6 | 3.6 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 22.7 | 22.7 | 21.9 | 21.9 |
| <W1 | 23.7 | 23.7 | 21.9 | 21.9 |
| W2> | 25.8 | 25.8 | 9.2 | 9.2 |
| <W2 | 20.6 | 20.6 | 9.2 | 9.2 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 27.8 | 27.8 |
| S | 0.0 | 0.0 | 3.2 | 3.2 |
| E> | 1.9 | 1.9 | 0.0 | 0.0 |
| EG+ | 0.1 | 0.0 | 0.6 | 0.6 |
| <E | 1.9 | 1.9 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.6 | 0.6 |
| WP | 1.5 | 1.5 | 17.6 | 17.6 |
| WB1> | 0.0 | 0.0 | 0.0 | 6.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 6.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 6.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 6.0 |
| EB> | 0.0 | 0.0 | 0.0 | 2.0 |
| <EB | 0.0 | 0.0 | 0.0 | 2.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 6-D | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | 6-A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.22 | 36.458 | 194.44 | 1.25 | 45.57 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 1.51 | 32.075 | 195.10 | 1.50 | 48.11 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 3 | 2 | S1 | 6.02 | 27.664 | 168.27 | 1.75 | 48.41 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 4 | 1 | S1 | 14.74 | 33.296 | 202.53 | 1.50 | 49.94 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 5 | 1 | S1 | 3.97 | 38.009 | 202.72 | 1.50 | 57.01 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Desc. | Pitches 1st/2nd (in.) | Configuration ID | Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 4 | 1 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 16 | -10.0 | 14.9 | 2268.2 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.3 | 2343.9 | Thin plate | 159.0 | 2591.4 |
| 2 | 1 | 16 | -10.0 | 14.9 | 2268.2 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.3 | 2343.9 | Thin plate | 159.0 | 2591.4 |
| 3 | 2 | 14 | 1.7 | 9.4 | 167.3 | Thin plate | 212.1 | 623.8 | 34 | 8.7 | 1.8 | 454.8 | Thin plate | 318.1 | 922.5 |
| 4 | 1 | 15 | 1.7 | 9.4 | 167.3 | Thin plate | 212.1 | 623.8 | 35 | 8.7 | 1.8 | 454.8 | Thin plate | 318.1 | 922.5 |
| 5 | 2 | 17 | -17.6 | 14.2 | 2408.7 | Thin plate | 159.0 | 2580.7 | 12 | 11.5 | 10.4 | 1914.2 | Thin plate | 159.0 | 2580.7 |
| 6 | 2 | 17 | -17.6 | 14.2 | 2408.7 | Thin plate | 159.0 | 2580.7 | 12 | 11.5 | 10.4 | 1914.2 | Thin plate | 159.0 | 2580.7 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/12 | 21/6/6 | (2)FB4110 | |
| 3 | 3/10/7 | 11/6/6 | FB4030 | |
| 4 | 1/2/0 | 1/6/13 | FB3000 | |
| 4 | 11/2/0 | 11/6/13 | FB4030 | |
| 5 | 6/2/0 | 21/6/13 | (2)FB4110 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.4 | 0.9 | -22.0 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.4 | -0.9 | -22.0 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 1 | 19.24 | 42.00 | 16 | 18 | -21.4 | -7.9 | -2317.0 | 0.0 | 90.5 | 12.8 | 3070.8 | 343.3 | 0.81 | 0.62 |
| 2 | 1.11 | 42.00 | 16 | 18 | -10.0 | 14.3 | -2268.2 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.67 | 1.02 |
| 3 | 0.00 | 34.00 | 9 | 16 | -5.1 | 13.1 | 1525.6 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.77 | 1.01 |
| 4 | 14.67 | 34.00 | 9 | 17 | -11.7 | -10.6 | -1563.2 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.81 | 0.95 |
| 5 | 6.87 | 42.00 | 17 | 17 | -17.6 | -12.8 | -2408.7 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.73 | 0.91 |
| 6 | 19.24 | 42.00 | 17 | 17 | -24.7 | 9.2 | -2417.8 | 0.0 | 90.5 | 12.8 | 3207.6 | 343.3 | 0.84 | 0.72 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.52 | 1.00 | 1.00 | 0.90 | 0.68 |
| 2 | 1.11 | 258.48 | 27.0 | 27.0 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.00 | 1.00 | 1.00 | 0.96 | 0.52 |
| 3 | 0.00 | 258.48 | 120.1 | 30.0 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.11 | 1.00 | 1.00 | 0.84 | 0.56 |
| 4 | 14.67 | 258.48 | 120.1 | 120.1 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.22 | 1.00 | 1.00 | 0.84 | 0.56 |
| 5 | 6.87 | 258.48 | 8.3 | 8.3 | 11.51 | 11.51 | 2735.96 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.55 | 1.02 | 1.00 | 1.00 | 0.96 | 0.52 |
| 6 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.60 | 1.00 | 1.00 | 0.90 | 0.68 |



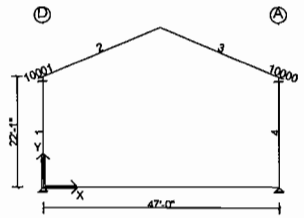


**User Defined Frame Point Loads for Cross Section: 6**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4080.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7200.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5070.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1980.00 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7200.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 6**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -54.00 | 0/0/0 | -54.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.75 | 0/0/0 | -69.75 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -150.00 | 0/0/0 | -150.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -600.00 | 0/0/0 | -600.00 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.88 | 0/0/0 | -68.88 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 380.34 | 0/0/0 | 380.34 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 503.03 | 0/0/0 | 503.03 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 110.41 | 0/0/0 | 110.41 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 233.09 | 0/0/0 | 233.09 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 6**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/205 ) | 1.189 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1958 ) | 0.251 | 4 | 2 | 7 | W2> |

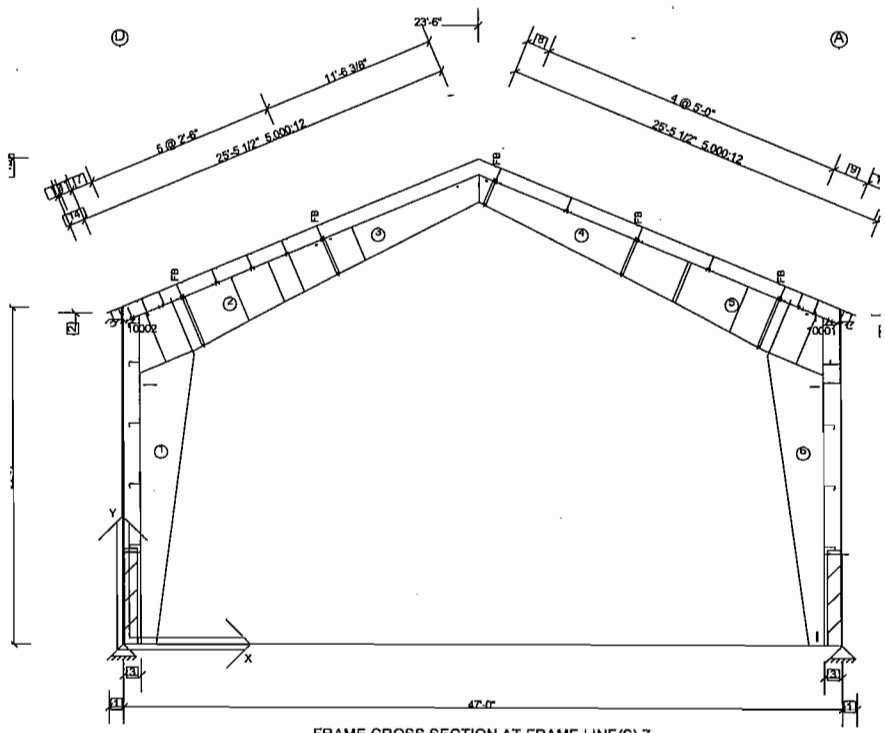
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 4, Frame at: 151/0/0**
Frame Cross Section: 7




FRAME CROSS SECTION AT FRAME LINE(S) 7

**Dimension Key**
1 11 3/8"
2 21'-8 1/4"
3 1'-2"
4 5 3/4"
5 2'-6 9/16"
6 1'-0 11/16"
7 1'-5 1/8"
8 1'-6 13/16"
9 2'-4 1/8"
10 1'-6 9/16"
11 9 7/16"
12 2 7/8"
13 31'-10 1/2" Ridge Ht.

14 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX310) and 6(CX311): 37'-5 13/16"
Vert. Clearance at member 1(CX310): 18'-11 3/4"
Vert. Clearance at member 6(CX311): 18'-11 3/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 151/0/0 | 29/8/8 | Rigid Frame | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 25 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 26 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 30 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 32 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 34 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 36 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 38 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 40 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 42 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 44 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 47 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 49 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 50 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | -1.39 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.3125 | 0.1875 | 42.00 | 34.00 | 9.19 | 290.3 | 55.00 | 55.00 | KN | SS | 3P |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 6.00 | 0.2500 | 0.1644 | 34.00 | 20.00 | 15.00 | 378.7 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.2500 | 0.1644 | 20.00 | 34.00 | 15.00 | 378.6 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.3125 | 0.1875 | 34.00 | 42.00 | 9.19 | 290.3 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.3750 | 0.1875 | 12.00 | 42.00 | 21.53 | 894.2 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 3191.2 (p) (Includes all plates)
Frame Pricing Weight = 3485.0 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 7**

| Type | | Exterior Column | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 47/0/0 | | | | | |
| Grid1 - Grid2 | | 7-D | | 7-A | | | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 9 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 1.000 | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | | | |
| D | Frm | 1.0 | 4.4 | -1.0 | 0.1 | 6.1 | - | - | - |
| CG | Frm | 2.9 | 9.2 | -2.9 | - | 6.4 | - | - | - |
| L> | Frm | 3.9 | 13.5 | -3.9 | - | 14.1 | - | - | - |
| <L | Frm | 3.9 | 13.5 | -3.9 | - | 14.1 | - | - | - |
| S> | Frm | 0.4 | 1.6 | -0.4 | - | 1.6 | - | - | - |
| <S | Frm | 0.4 | 1.6 | -0.4 | - | 1.6 | - | - | - |
| US1* | Frm | 0.7 | 1.4 | -0.7 | - | 2.1 | - | - | - |
| *US1 | Frm | 0.3 | 1.3 | -0.3 | - | 0.7 | - | - | - |
| W1> | Frm | -14.0 | -17.3 | -8.5 | - | -4.4 | - | - | - |
| <W1 | Frm | 10.0 | -4.0 | 13.4 | - | -17.7 | - | - | - |
| W2> | Frm | -17.5 | -12.4 | -8.1 | - | 3.3 | - | - | - |
| <W2 | Frm | 6.6 | 0.9 | 13.8 | - | -10.0 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - |
| L | Frm | 3.9 | 13.5 | -3.9 | - | 14.1 | - | - | - |
| S | Frm | 0.4 | 1.6 | -0.4 | - | 1.6 | - | - | - |
| E> | Frm | -1.0 | -0.8 | -0.9 | - | 0.7 | - | - | - |
| EG+ | Frm | 0.1 | 0.3 | -0.1 | - | 0.3 | - | - | - |
| <E | Frm | 1.0 | 0.8 | 0.9 | - | -0.7 | - | - | - |
| EG- | Frm | -0.1 | -0.3 | 0.1 | - | -0.3 | - | - | - |
| WP | Frm | 4.2 | -9.8 | -5.8 | - | -8.3 | - | - | - |
| WB1> | Brc | -0.0 | -0.0 | 0.0 | 1.4 | 6.0 | - | - | - |
| <WB1 | Brc | 0.0 | 0.0 | -0.0 | -1.3 | -6.0 | - | - | - |
| WB2> | Brc | -0.0 | -0.0 | 0.0 | 1.4 | 6.0 | - | - | - |
| <WB2 | Brc | 0.0 | 0.0 | -0.0 | -1.3 | -6.0 | - | - | - |
| EB> | Brc | -0.0 | -0.0 | 0.0 | 0.5 | 2.0 | - | - | - |
| <EB | Brc | 0.0 | 0.0 | -0.0 | -0.4 | -2.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 7-D | 16.9 | 13 | 14.3 | 16 | - | - | - | - | 14.6 | 11 | 27.0 | 1 | - | - | - | - |
| 47/0/0 | 7-A | 13.1 | 15 | 13.3 | 14 | 1.3 | 42 | 1.4 | 37 | 14.1 | 12 | 26.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 9.1 | 10.5 |
| CG | 0.0 | 0.0 | 15.5 | 15.5 |





| | | | | |
|---|---|---|---|---|
| L> | 0.0 | 0.0 | 27.5 | 27.5 |
| <L | 0.0 | 0.0 | 27.5 | 27.5 |
| S> | 0.0 | 0.0 | 3.2 | 3.2 |
| <S | 0.0 | 0.0 | 3.2 | 3.2 |
| US1* | 0.0 | 0.0 | 3.5 | 3.5 |
| *US1 | 0.0 | 0.0 | 2.0 | 2.0 |
| W1> | 22.5 | 22.5 | 21.7 | 21.7 |
| <W1 | 23.5 | 23.5 | 21.7 | 21.7 |
| W2> | 25.6 | 25.6 | 9.1 | 9.1 |
| <W2 | 20.4 | 20.4 | 9.1 | 9.1 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 27.5 | 27.5 |
| S | 0.0 | 0.0 | 3.2 | 3.2 |
| E> | 1.9 | 1.9 | 0.0 | 0.0 |
| EG+ | 0.1 | 0.0 | 0.6 | 0.6 |
| <E | 1.9 | 1.9 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.6 | 0.6 |
| WP | 1.6 | 1.6 | 18.1 | 18.1 |
| WB1> | 0.0 | 0.0 | 0.0 | 6.0 |
| <WB1 | 0.0 | 0.0 | 0.0 | 6.0 |
| WB2> | 0.0 | 0.0 | 0.0 | 6.0 |
| <WB2 | 0.0 | 0.0 | 0.0 | 6.0 |
| EB> | 0.0 | 0.0 | 0.0 | 2.0 |
| <EB | 0.0 | 0.0 | 0.0 | 2.0 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 7-D | 1 | 0.375 | 9 | 13 | 4 | 1.000 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | 7-A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |
| 2 | 1 | S1 | 4.22 | 36.458 | 194.44 | 1.25 | 45.57 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 3 | 1 | S1 | 1.51 | 32.075 | 195.10 | 1.50 | 48.11 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 3 | 2 | S1 | 6.02 | 27.664 | 168.27 | 1.75 | 48.41 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 4 | 1 | S1 | 14.74 | 33.296 | 202.53 | 1.50 | 49.94 | 0.1875 | 2.000 | Both | F-OS-0.1875,W-OS-0.1875 |
| 5 | 1 | S1 | 3.97 | 38.009 | 202.72 | 1.50 | 57.01 | 0.1875 | 2.000 | Opposite Fillet | Std |
| 6 | 1 | S9 | 17.72 | 40.296 | 214.91 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.5000 | 3.500 | Opposite Fillet | W-BS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Outside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 3 | 2 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 4 | 1 | SP | 0.500 | 6.00 | 22.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 12 | Flush | 2.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 47.75 | 0.750 | A325X/ST | 3.00 | 31 | Extended | 3.50 | 31 | Extended | 3.50 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 16 | -9.9 | 14.7 | 2246.6 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.2 | 2320.4 | Thin plate | 159.0 | 2591.4 |
| 2 | 1 | 16 | -9.9 | 14.7 | 2246.6 | Thin plate | 159.0 | 2591.4 | 13 | 1.1 | 10.2 | 2320.4 | Thin plate | 159.0 | 2591.4 |
| 3 | 2 | 14 | 1.7 | 9.3 | 165.9 | Thin plate | 212.1 | 623.8 | 30 | 8.9 | 1.8 | 451.6 | Thin plate | 318.1 | 922.5 |
| 4 | 1 | 15 | 1.7 | 9.3 | 165.9 | Thin plate | 212.1 | 623.8 | 31 | 8.9 | 1.8 | 451.6 | Thin plate | 318.1 | 922.5 |
| 5 | 2 | 17 | -17.4 | 14.1 | 2383.5 | Thin plate | 159.0 | 2580.7 | 12 | 11.4 | 10.3 | 1895.8 | Thin plate | 159.0 | 2580.7 |
| 6 | 2 | 17 | -17.4 | 14.1 | 2383.5 | Thin plate | 159.0 | 2580.7 | 12 | 11.4 | 10.3 | 1895.8 | Thin plate | 159.0 | 2580.7 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/12 | 21/6/6 | FB4110 | |
| 3 | 3/10/7 | 11/6/6 | FB4030 | |
| 4 | 1/2/0 | 1/6/13 | FB3000 | |
| 4 | 11/2/0 | 11/6/13 | FB4030 | |
| 5 | 6/2/0 | 21/6/13 | FB4110 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.4 | 0.9 | -21.8 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.4 | -0.9 | -21.8 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.11 | 0.05 |
| 1 | 16.03 | 37.00 | 13 | 18 | 10.3 | -7.8 | 2154.5 | 0.0 | 422.3 | 14.6 | 2759.2 | 342.3 | 0.79 | 0.61 |
| 2 | 1.11 | 42.00 | 16 | 18 | -9.9 | 14.2 | -2246.6 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.66 | 1.01 |
| 3 | 0.00 | 34.00 | 9 | 16 | -5.1 | 13.0 | 1509.8 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.76 | 1.00 |
| 4 | 14.67 | 34.00 | 9 | 17 | -11.6 | -10.5 | -1547.0 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.80 | 0.94 |
| 5 | 6.87 | 42.00 | 17 | 17 | -17.4 | -12.7 | -2383.5 | 0.0 | 188.1 | 12.7 | 3520.9 | 183.2 | 0.72 | 0.90 |
| 6 | 19.24 | 42.00 | 17 | 17 | -24.5 | 9.1 | -2392.4 | 0.0 | 90.5 | 12.8 | 3209.6 | 343.3 | 0.83 | 0.71 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 16.03 | 230.86 | 230.9 | 230.9 | 12.80 | 12.80 | 2756.45 | 32.02 | 149.00 | 8.00 | 171.47 | 12.32 | 0.36 | 10737.80 | 1.44 | 1.00 | 1.00 | 0.90 | 1.00 |
| 2 | 1.11 | 258.48 | 27.0 | 27.0 | 11.51 | 11.51 | 2735.97 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.57 | 1.00 | 1.00 | 1.00 | 0.96 | 0.52 |
| 3 | 0.00 | 258.48 | 120.1 | 30.0 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.11 | 1.00 | 1.00 | 0.84 | 0.56 |
| 4 | 14.67 | 258.48 | 120.1 | 120.1 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.22 | 1.00 | 1.00 | 0.84 | 0.56 |
| 5 | 6.87 | 258.48 | 8.3 | 8.3 | 11.51 | 11.51 | 2735.96 | 11.27 | 130.28 | 3.76 | 158.41 | 5.99 | 0.21 | 4897.55 | 1.02 | 1.00 | 1.00 | 0.96 | 0.52 |
| 6 | 19.24 | 230.86 | 230.9 | 230.9 | 13.73 | 13.73 | 3695.74 | 32.02 | 175.99 | 8.01 | 204.64 | 12.36 | 0.37 | 13870.94 | 1.60 | 1.00 | 1.00 | 0.90 | 0.68 |



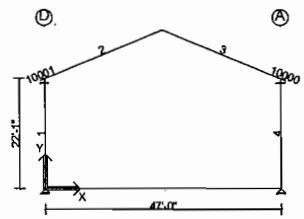


**User Defined Frame Point Loads for Cross Section: 7**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 4040.33 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 7130.00 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -5020.71 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1960.75 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -7130.00 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section: 7**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -53.47 | 0/0/0 | -53.47 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -69.07 | 0/0/0 | -69.07 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -148.54 | 0/0/0 | -148.54 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -594.17 | 0/0/0 | -594.17 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -68.21 | 0/0/0 | -68.21 | 8/5/3 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 25.05 | 0/0/0 | 25.05 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 33.13 | 0/0/0 | 33.13 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 7.27 | 0/0/0 | 7.27 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 15.35 | 0/0/0 | 15.35 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 351.60 | 0/0/0 | 351.60 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 465.01 | 0/0/0 | 465.01 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 102.06 | 0/0/0 | 102.06 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 215.47 | 0/0/0 | 215.47 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System Derived | 1.000 | 0 | 240 | 0.700 WB1> | WB1> |
| 11 | System Derived | 1.000 | 0 | 240 | 0.700 <WB1 | <WB1 |
| 12 | System Derived | 1.000 | 0 | 240 | 0.700 WB2> | WB2> |
| 13 | System Derived | 1.000 | 0 | 240 | 0.700 <WB2 | <WB2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 15 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 16 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 17 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 18 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 19 | System Derived | 1.000 | 200 | 0 | 0.700 WB1> | WB1> |
| 20 | System Derived | 1.000 | 200 | 0 | 0.700 <WB1 | <WB1 |
| 21 | System Derived | 1.000 | 200 | 0 | 0.700 WB2> | WB2> |
| 22 | System Derived | 1.000 | 200 | 0 | 0.700 <WB2 | <WB2 |
| 23 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 24 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |
| 25 | System Derived | 1.000 | 50 | 0 | 1.0 EB> | EB> |
| 26 | System Derived | 1.000 | 50 | 0 | 1.0 <EB | <EB |

**Controlling Frame Deflection Ratios for Cross Section: 7**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/207 ) | 1.178 | 1 | 2 | 16 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1977 ) | 0.249 | 4 | 2 | 7 | W2> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

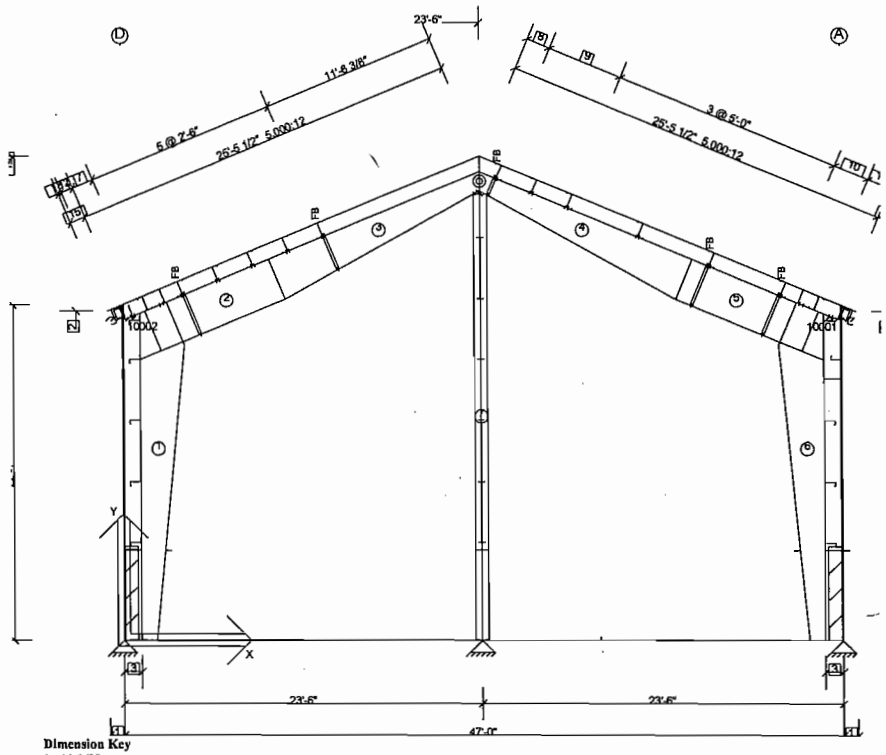
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 4, Frame at: 180/5/0**

Frame Cross Section:




**Dimension Key**

1 11 3/8"
2 21'-8 1/4"
3 1'-2"
4 5 3/4"
5 2'-6 9/16"
6 1'-0 11/16"
7 1'-5 1/8"
8 1'-6 13/16"
9 2 @ 2'-6"
10 2'-1 1/8"
11 1'-6 9/16"
12 9 7/16"
13 2 7/8"

14 31'-10 1/2" Ridge Ht.
15 1'-0 5/16" 5.000:12

**Frame Clearances**
Horiz. Clearance between members 1(CX312) and 6(CX313): 38'-9 7/8"
Vert. Clearance at member 1(CX312): 19'-5 3/16"
Vert. Clearance at member 6(CX313): 19'-5 3/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)



VP BUILDINGS YARCO PRUDEH

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**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 180/5/0 | 16/3/8 | Rigid Frame with Endposts | 90.0000 | | - | Stress Check |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 US1* | D + CG + US1* |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 *US1 | D + CG + *US1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 10 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 11 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 15 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 16 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 27 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 28 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 29 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 30 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 31 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 32 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.50 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 10002 | 5.00 | 0.1345 | 0.1345 | 11.50 | 11.50 | 1.50 | 32.5 | 55.00 | 55.00 | SS | SS | 3P |
| 1 | 8.00 | 0.2500 | 0.1644 | 12.00 | 34.00 | 21:53 | 622.0 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 6.00 | 0.2500 | 0.1644 | 34.00 | 34.00 | 9.19 | 233.3 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 6.00 | 0.1875 | 0.1644 | 34.00 | 14.00 | 15.00 | 316.0 | 55.00 | 55.00 | SS | SP | 3P |
| 4 | 6.00 | 0.1875 | 0.1644 | 14.00 | 34.00 | 15.00 | 316.0 | 55.00 | 55.00 | SP | SS | 3P |
| 5 | 6.00 | 0.2500 | 0.1644 | 34.00 | 34.00 | 9.19 | 233.4 | 55.00 | 55.00 | SS | KN | 3P |
| 6 | 8.00 | 0.2500 | 0.1644 | 12.00 | 34.00 | 21.53 | 622.0 | 55.00 | 55.00 | BP | KN | 3P |
| 7 | 10.00 | 0.5000 | 0.1875 | 13.00 | 13.00 | 31.88 | 1238.3 | 55.00 | 55.00 | BP | SS | 3P |

Total Frame Weight = 3645.9 (p) (Includes all plates)
Frame Pricing Weight = 3925.0 (p) (Includes all pieces)

**Frame Member Releases**

| Member | Joint 1 | Joint 2 |
|---|---|---|
| 7 | No | Yes |

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 6 | 47/0/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 7 | 23/6/0 | 0/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 0 | 23/6/0 | 31/10/8 | Yes | No | No | 0/0/0 | 0/0/0 | 0.0000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10001 | 47/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |
| 10002 | 0/0/0 | 22/1/0 | Yes | Yes | Yes | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Interior Column | | | Exterior Column | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 23/6/0 | | | 47/0/0 | | | |
| Grid1 - Grid2 | | -D | | B-9 | | | -A | | | |
| Base Plate W x L (in.) | | 9 x 13 | | 11 x 14 | | | 9 x 13 | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | 0.375 | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | 4 - 0.750 | | | |
| Column Base Elev. | | 100'-0" | | 100'-0" | | | 100'-0" | | | |
| Load Type | Desc. | Hx | Vy | Hx | Hz | Vy | Hx | Vy | | |
| D | Frm | 0.6 | 2.8 | - | - | 1.3 | -0.6 | 2.7 | - | - |
| CG | Frm | 1.6 | 5.1 | - | - | - | -1.6 | 3.6 | - | - |
| L> | Frm | 2.2 | 7.8 | - | - | - | -2.2 | 8.2 | - | - |
| <L | Frm | 2.2 | 7.8 | - | - | - | -2.2 | 8.2 | - | - |
| S> | Frm | 0.3 | 0.9 | - | - | - | -0.3 | 1.0 | - | - |
| <S | Frm | 0.3 | 0.9 | - | - | - | -0.3 | 1.0 | - | - |
| US1* | Frm | 0.4 | 0.8 | - | - | - | -0.4 | 1.2 | - | - |
| *US1 | Frm | 0.2 | 0.8 | - | - | - | -0.2 | 0.4 | - | - |
| W1> | Frm | -7.7 | -10.0 | - | 9.1 | - | -4.6 | -2.8 | - | - |
| <W1 | Frm | 5.3 | -2.6 | - | -8.2 | - | 7.3 | -10.2 | - | - |
| W2> | Frm | -9.7 | -7.3 | - | - | - | -4.3 | 1.5 | - | - |
| <W2 | Frm | 3.4 | 0.0 | - | - | - | 7.6 | -6.0 | - | - |
| WP | Frm | 1.8 | -7.5 | - | - | - | -3.0 | -6.4 | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 2.2 | 7.8 | - | - | - | -2.2 | 8.2 | - | - |
| S | Frm | 0.3 | 0.9 | - | - | - | -0.3 | 1.0 | - | - |
| E> | Frm | -0.5 | -0.4 | - | 0.3 | - | -0.5 | 0.4 | - | - |
| EG+ | Frm | 0.1 | 0.2 | - | - | - | -0.1 | 0.1 | - | - |
| <E | Frm | 0.5 | 0.4 | - | -0.3 | - | 0.5 | -0.4 | - | - |
| EG- | Frm | -0.1 | -0.2 | - | - | - | 0.1 | -0.1 | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -D | 9.3 | 14 | 7.9 | 18 | - | - | - | - | 8.3 | 12 | 15.8 | 1 | - | - | - | - |
| 23/6/0 | B-9 | - | - | - | - | 8.2 | 8 | 9.1 | 7 | - | - | 1.3 | 1 | - | - | - | - |
| 23/6/0 | 31/10/8 | - | - | - | - | 6.1 | 8 | 6.8 | 7 | 1.3 | 1 | - | - | - | - | - | - |
| 47/0/0 | -A | 7.3 | 17 | 7.2 | 15 | - | - | - | - | 8.6 | 13 | 14.5 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 7.1 | 5.6 |
| CG | 0.0 | 0.0 | 8.8 | 8.8 |
| L> | 0.0 | 0.0 | 16.0 | 16.0 |
| <L | 0.0 | 0.0 | 16.0 | 16.0 |
| S> | 0.0 | 0.0 | 1.9 | 1.9 |
| <S | 0.0 | 0.0 | 1.9 | 1.9 |
| US1* | 0.0 | 0.0 | 2.0 | 2.0 |
| *US1 | 0.0 | 0.0 | 1.2 | 1.2 |
| W1> | 12.3 | 12.3 | 12.7 | 12.7 |
| <W1 | 12.7 | 12.7 | 12.8 | 12.8 |
| W2> | 14.0 | 14.0 | 5.8 | 5.8 |
| <W2 | 11.0 | 11.0 | 5.9 | 5.9 |
| WP | 1.2 | 1.2 | 13.8 | 13.9 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 16.0 | 16.0 |
| S | 0.0 | 0.0 | 1.9 | 1.9 |
| E> | 1.1 | 1.1 | 0.0 | 0.0 |





| | | | | |
|---|---|---|---|---|
| EG+ | 0.1 | 0.0 | 0.3 | 0.3 |
| <E | 1.1 | 1.1 | 0.0 | 0.0 |
| EG- | 0.1 | 0.0 | 0.3 | 0.3 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | -D | 1 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 23/6/0 | B-9 | 7 | 0.375 | 11 | 14 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 47/0/0 | -A | 6 | 0.375 | 9 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S9 | 18.44 | 33.236 | 202.17 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 1 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.2500 | 0.3125 | 3.500 | Opposite Fillet | W-OS-0.1875 |
| 6 | 1 | S9 | 18.44 | 33.236 | 202.17 | N/A | N/A | 0.3125 | 3.500 | Both | W-OS-0.1875 |
| 6 | 2 | S11 (S10) | | Alternate | Web | Thick.= | 0.1875 | 0.3125 | 3.500 | Opposite Fillet | W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.500 | 8.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |
| 2 | 1 | KN(Face) | 0.500 | 6.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |
| 3 | 2 | SP | 0.375 | 6.00 | 15.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush (0) | 0.00 |
| 4 | 1 | SP | 0.375 | 6.00 | 15.72 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush (0) | 0.00 |
| 5 | 2 | KN(Face) | 0.500 | 6.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |
| 6 | 2 | KN(Face) | 0.500 | 8.00 | 36.75 | 0.750 | A325X/ST | 3.00 | 12 | Flush (0) | 2.00 | 31 | Extended | 3.25 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Jt. | Ld | Axial | Shear | Moment | Design | Shear | Moment | Ld | Axial | Shear | Moment | Design | Shear | Moment |
| No. | No. | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) | Cs | (k) | (k) | (in-k) | Proc. | (k) | (in-k) |
| 1 | 2 | 21 | -5.3 | 8.7 | 1313.9 | Thin plate | 318.1 | 1498.5 | 17 | 0.4 | 5.8 | 1313.5 | Thin plate | 318.1 | 2132.2 |
| 2 | 1 | 22 | -5.3 | 8.7 | 1313.9 | Thin plate | 318.1 | 1498.5 | 18 | 0.4 | 5.8 | 1313.5 | Thin plate | 318.1 | 2132.2 |
| 3 | 2 | 14 | 1.2 | 5.0 | 89.2 | Thin plate | 106.0 | 270.5 | 21 | 2.6 | 1.8 | 273.3 | Thin plate | 106.0 | 290.2 |
| 4 | 1 | 14 | 1.2 | 5.0 | 89.2 | Thin plate | 106.0 | 270.5 | 21 | 2.6 | 1.8 | 273.3 | Thin plate | 106.0 | 290.2 |
| 5 | 2 | 22 | -9.5 | 8.7 | 1400.2 | Thin plate | 318.1 | 1498.5 | 16 | 6.0 | 6.2 | 1070.4 | Thin plate | 318.1 | 2132.2 |
| 6 | 2 | 21 | -9.5 | 8.7 | 1400.2 | Thin plate | 318.1 | 1498.5 | 15 | 6.0 | 6.2 | 1070.4 | Thin plate | 318.1 | 2132.2 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 1/2/1 | 21/6/6 | FB4060 | |
| 3 | 3/10/7 | 11/6/6 | FB4020 | |
| 4 | 1/2/0 | 1/6/13 | FB2080 | |
| 5 | 1/2/0 | 16/6/13 | FB4060 | |
| 5 | 6/2/0 | 21/6/13 | FB4060 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. | Loc. | Depth | Axial + | Shear | Axial Pr | Shear Vr | Mom-x Mrx | Mom-y Mry | Axial Pc | Shear Vc | Mom-x Mcx | Mom-y Mcy | Axial + | Shear |
| No. | ft | in. | Flexure | | k | k | in-k | in-k | k | k | in-k | in-k | Flexure | |
| 10001 | 2.29 | 11.50 | 1 | 1 | 0.2 | 0.5 | -12.8 | 0.0 | 94.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 10002 | 2.29 | 11.50 | 1 | 1 | 0.2 | -0.5 | -12.8 | 0.0 | 88.2 | 17.5 | 204.7 | 39.0 | 0.06 | 0.03 |
| 1 | 19.66 | 34.00 | 18 | 20 | -12.1 | -4.5 | -1336.3 | 0.0 | 57.7 | 10.6 | 1635.9 | 250.3 | 0.88 | 0.42 |
| 2 | 0.90 | 34.00 | 18 | 2 | -5.3 | 10.2 | -1313.9 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.66 | 0.96 |
| 3 | 6.07 | 25.66 | 9 | 18 | -2.4 | 7.2 | 656.3 | 0.0 | 85.1 | 14.1 | 978.4 | 105.7 | 0.68 | 0.69 |
| 4 | 14.79 | 34.00 | 9 | 19 | -6.4 | -6.3 | -835.2 | 0.0 | 31.3 | 10.5 | 943.2 | 105.7 | 0.99 | 0.60 |
| 5 | 7.31 | 34.00 | 19 | 1 | -9.5 | -9.1 | -1400.2 | 0.0 | 131.3 | 10.6 | 2043.7 | 113.7 | 0.72 | 0.86 |
| 6 | 19.66 | 34.00 | 19 | 19 | -14.0 | 5.3 | -1407.0 | 0.0 | 57.7 | 10.6 | 1712.0 | 250.3 | 0.92 | 0.50 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 15.94 | 13.00 | 7 | 7 | -1.3 | -9.1 | -843.4 | 0.0 | 85.8 | 42.6 | 968.4 | 770.3 | 0.77 | 0.21 | | | | |

| Mem. No. | Loc. ft | Lx in. | Ly/L1 in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10001 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 10002 | 2.29 | 27.49 | 27.5 | 27.5 | 2.86 | 2.86 | 59.32 | 2.80 | 10.32 | 1.12 | 11.88 | 1.73 | 0.02 | 90.56 | 1.00 | 1.00 | 1.15 | 0.60 | 1.00 |
| 1 | 19.66 | 235.96 | 236.0 | 236.0 | 9.51 | 9.51 | 1654.14 | 21.35 | 97.30 | 5.34 | 113.62 | 8.23 | 0.13 | 6078.53 | 1.52 | 1.00 | 1.00 | 0.65 | 0.74 |
| 2 | 0.90 | 265.11 | 22.3 | 22.3 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.00 | 1.00 | 1.00 | 0.84 | 0.56 |
| 3 | 6.07 | 265.11 | 142.1 | 142.1 | 6.41 | 6.41 | 586.21 | 6.76 | 45.70 | 2.25 | 54.92 | 3.55 | 0.06 | 1096.08 | 1.63 | 1.00 | 1.00 | 0.65 | 0.64 |
| 4 | 14.79 | 265.11 | 180.3 | 180.3 | 7.78 | 7.78 | 1163.95 | 6.76 | 68.47 | 2.25 | 84.51 | 3.60 | 0.08 | 1932.85 | 1.57 | 1.00 | 1.00 | 0.65 | 0.76 |
| 5 | 7.31 | 265.11 | 13.7 | 13.7 | 8.51 | 8.51 | 1369.37 | 9.01 | 80.55 | 3.00 | 96.75 | 4.73 | 0.11 | 2566.42 | 1.03 | 1.00 | 1.00 | 0.84 | 0.56 |
| 6 | 19.66 | 235.96 | 236.0 | 236.0 | 9.51 | 9.51 | 1654.14 | 21.35 | 97.30 | 5.34 | 113.62 | 8.23 | 0.13 | 6078.53 | 1.60 | 1.00 | 1.00 | 0.65 | 0.74 |
| 7 | 15.94 | 382.50 | 382.5 | 382.5 | 12.25 | 12.25 | 417.83 | 83.34 | 64.28 | 16.67 | 69.25 | 25.11 | 0.86 | 3255.47 | 1.00 | 1.00 | 1.08 | 1.00 | 1.00 |



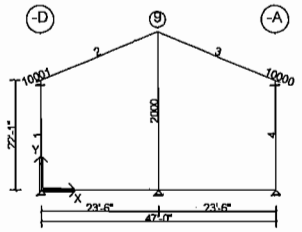


**User Defined Frame Point Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Offset | H or V | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | W1> | Clerestory->Resolved From Plane | 2221.46 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | W2> | Clerestory->Resolved From Plane | 3920.23 | 21/0/0 | NA | NA | N | RIGHT | 1.000 | OF |
| 1 | p | <W1 | Clerestory->Resolved From Plane | -2760.49 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 1 | p | <W2 | Clerestory->Resolved From Plane | -1078.06 | 21/0/0 | NA | NA | N | LEFT | 1.000 | OF |
| 2 | p | CG | Clerestory->Resolved From Plane | -3932.47 | 8/6/0 | NA | NA | N | DOWN | 1.000 | OF |

**User Defined Frame Line Loads for Cross Section:**

| Side | Units | Type | Description | Mag1 | Loc1 | Mag2 | Loc2 | Supp. | Dir. | Coef. | Loc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 0/0/0 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -29.40 | 8/5/5 | -29.40 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 0/0/0 | -37.98 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | D | Upper Roof->Resolved From Plane | -37.98 | 8/5/5 | -37.97 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 0/0/0 | -81.67 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | CG | Upper Roof->Resolved From Plane | -81.67 | 8/5/5 | -81.65 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L> | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 0/0/0 | -326.69 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | L | Upper Roof->Resolved From Plane | -326.69 | 8/5/5 | -326.62 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S> | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | <S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | US1* | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | *US1 | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 0/0/0 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | S | Upper Roof->Resolved From Plane | -37.50 | 8/5/5 | -37.50 | 8/5/5 | N | DOWN | 1.000 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.25 | 0/0/0 | 132.25 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 132.25 | 8/5/5 | 132.25 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.91 | 0/0/0 | 174.91 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 174.91 | 8/5/5 | 174.91 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.39 | 0/0/0 | 38.39 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 38.39 | 8/5/5 | 38.39 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 81.05 | 0/0/0 | 81.05 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 81.05 | 8/5/5 | 81.05 | 9/1/1 | N | UP | 0.311 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 0/0/0 | 74.84 | 8/5/5 | N | UP | 0.507 | OF |
| 2 | plf | W1> | Upper Roof->Resolved From Plane | 74.84 | 8/5/5 | 74.84 | 9/1/1 | N | UP | 0.507 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 0/0/0 | 98.97 | 8/5/5 | N | UP | 0.671 | OF |
| 2 | plf | <W1 | Upper Roof->Resolved From Plane | 98.97 | 8/5/5 | 98.97 | 9/1/1 | N | UP | 0.671 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 0/0/0 | 21.72 | 8/5/5 | N | UP | 0.147 | OF |
| 2 | plf | W2> | Upper Roof->Resolved From Plane | 21.72 | 8/5/5 | 21.72 | 9/1/1 | N | UP | 0.147 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 0/0/0 | 45.86 | 8/5/5 | N | UP | 0.311 | OF |
| 2 | plf | <W2 | Upper Roof->Resolved From Plane | 45.86 | 8/5/5 | 45.86 | 9/1/1 | N | UP | 0.311 | OF |




**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 1.0 US1* | US1* |
| 4 | System | 1.000 | 0 | 240 | 1.0 *US1 | *US1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 7 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 8 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 9 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 10 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 12 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 13 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 14 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 15 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 16 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/201 ) | 1.226 | 1 | 2 | 12 | W2> |
| Max. Vertical Deflection for Span 1 | ( L/1779 ) | -0.281 | 4 | 1 | 1 | L |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Loads and Codes - Shape: Clerestory A**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code
Building Use: Standard Occupancy Structure
Built Up: 05AISC - ASD
Cold Form: 04AISI - ASD
Rainfall: 10.00 inches per hour

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.741)
Parts Wind Exposure Factor: 0.741

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 30/0/0
Primary Zone Strip Width: 18/2/12
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 27.24 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): I Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

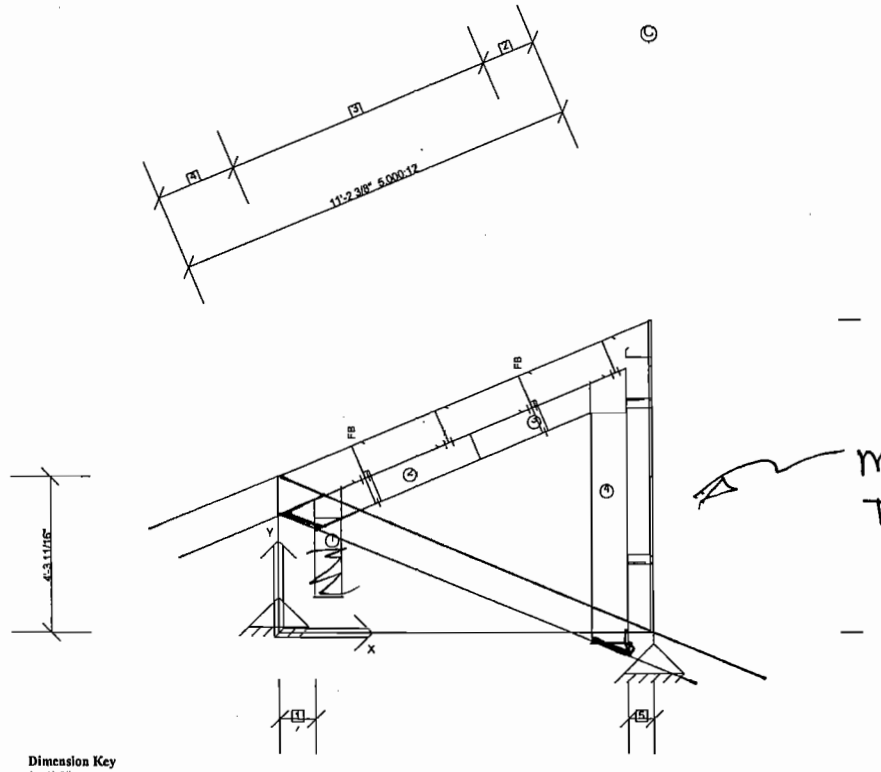
**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group I

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4973
Bracing Seismic Period: 0.2968
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Wall: 2, Frame at: 177.0**
Frame Cross Section:




MODIFY ALL THESE TO SIT ATOP RF'S

**Dimension Key**
1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX314) and 4(CX315): 6'-10 9/16"





Vert. Clearance at member 1(CX314): 3'-1 3/4"
Vert. Clearance at member 4(CX315): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 1/7/0 | 16/3/8 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 28 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 241.1 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 10/4/1 | | | | |
| Grid1 - Grid2 | | - | | -C | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | 8 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 132'-1 1/2" | | 130'-9 13/16" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 0.4 | -0.1 | 0.5 | - | - | - |
| CG | Frm | 0.1 | 0.4 | -0.1 | 0.4 | - | - | - |
| L> | Frm | 0.2 | 1.8 | -0.2 | 1.8 | - | - | - |





| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| <L | Frm | 0.2 | 1.8 | -0.2 | 1.8 | - | - | - |
| S> | Frm | 0.0 | 0.2 | -0.0 | 0.2 | - | - | - |
| <S | Frm | 0.0 | 0.2 | -0.0 | 0.2 | - | - | - |
| W1> | Frm | 2.7 | 0.5 | 1.3 | -3.7 | - | - | - |
| <W1 | Frm | -1.1 | -1.8 | -0.7 | -0.8 | - | - | - |
| W2> | Frm | 2.5 | 1.4 | 1.7 | -2.9 | - | - | - |
| <W2 | Frm | -1.3 | -0.9 | -0.4 | -0.1 | - | - | - |
| WP | Frm | 0.5 | -2.0 | -0.6 | -2.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 0.2 | 1.8 | -0.2 | 1.8 | - | - | - |
| S | Frm | 0.0 | 0.2 | -0.0 | 0.2 | - | - | - |
| E> | Frm | 0.1 | 0.1 | 0.0 | -0.0 | - | - | - |
| EG+ | Frm | - | 0.0 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | -0.1 | -0.0 | 0.0 | - | - | - |
| EG- | Frm | - | -0.0 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | - | 1.3 | 13 | 2.8 | 5 | - | - | - | - | 1.7 | 14 | 3.2 | 17 | - | - | - | - |
| 10/4/1 | -C | 0.8 | 6 | 1.6 | 12 | - | - | - | - | 3.4 | 10 | 2.7 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.0 | 0.9 |
| CG | 0.0 | 0.0 | 0.9 | 0.9 |
| L> | 0.0 | 0.0 | 3.6 | 3.6 |
| <L | 0.0 | 0.0 | 3.6 | 3.6 |
| S> | 0.0 | 0.0 | 0.4 | 0.4 |
| <S | 0.0 | 0.0 | 0.4 | 0.4 |
| W1> | 4.0 | 4.0 | 3.2 | 3.2 |
| <W1 | 1.8 | 1.8 | 2.7 | 2.7 |
| W2> | 4.2 | 4.2 | 1.6 | 1.6 |
| <W2 | 1.7 | 1.7 | 1.0 | 1.0 |
| WP | 0.1 | 0.1 | 4.1 | 4.1 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 3.6 | 3.6 |
| S | 0.0 | 0.0 | 0.4 | 0.4 |
| E> | 0.1 | 0.1 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.1 | 0.1 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | - | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | -C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. | Jt. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. | Width | Length | Diam. | Spec/Joint | Gages In/Out | Configuration | | Pitches 1st/2nd | Configuration | | Pitches 1st/2nd |
| No. | No. | | (in.) | (in.) | (in.) | (in.) | | (in.) | ID | Desc. | (in.) | ID | Desc. | (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 5 | -2.2 | 0.6 | 71.5 | Thin plate | 106.0 | 143.5 | 11 | 1.0 | 1.0 | 23.7 | Thin plate | 106.0 | 143.5 |
| 2 | 1 | 5 | -2.2 | 0.6 | 71.5 | Thin plate | 106.0 | 143.5 | 11 | 1.0 | 1.0 | 23.7 | Thin plate | 106.0 | 143.5 |
| 3 | 2 | 18 | 0.6 | 1.4 | 17.8 | Thin plate | 106.0 | 143.5 | 10 | -1.8 | 2.3 | 44.9 | Thin plate | 106.0 | 154.6 |
| 4 | 2 | 18 | 0.6 | 1.4 | 17.8 | Thin plate | 106.0 | 143.5 | 10 | -1.8 | 2.3 | 44.9 | Thin plate | 106.0 | 154.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | FB2050 | |
| 3 | 1/10/5 | 3/11/13 | FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 2.19 | 9.00 | 7 | 5 | -2.2 | -2.8 | -66.3 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.41 | 0.13 |
| 2 | 0.25 | 9.00 | 7 | 17 | -2.9 | 1.8 | -71.6 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.45 | 0.08 |
| 3 | 3.28 | 9.00 | 10 | 10 | -1.8 | 2.3 | 44.9 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.28 | 0.11 |
| 4 | 6.36 | 12.00 | 10 | 12 | 3.4 | -1.6 | 54.0 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.27 | 0.10 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.65 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.32 | 1.00 | 1.15 | 0.59 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/465 ) | -0.063 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/3966 ) | 0.023 | 2 | 2 | 3 | W1> |

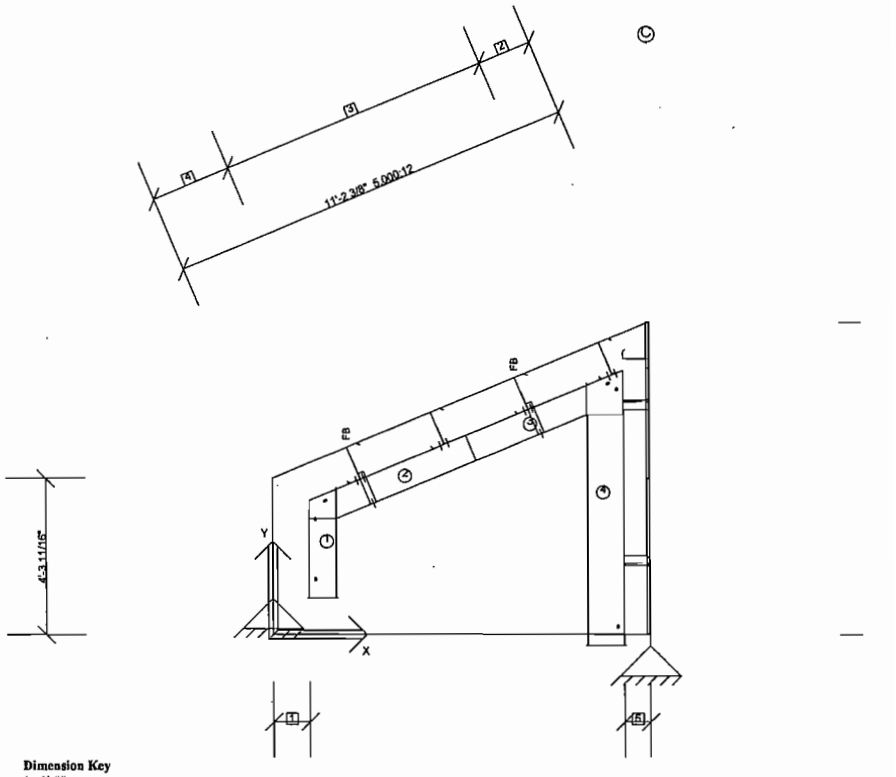
* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 2, Frame at: 31/0/0**
Frame Cross Section: 7




**Dimension Key**
1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX316) and 4(CX317): 6'-10 9/16"

Vert. Clearance at member 1(CX316): 3'-1 3/4"
Vert. Clearance at member 4(CX317): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 31/0/0 | 29/8/8 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 241.1 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 7**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 10/4/1 | | | | | |
| Grid1 - Grid2 | | 7- | | | 7-C | | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 132'-1 1/2" | | | 130'-9 13/16" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 0.1 | - | 0.7 | -0.1 | - | 0.7 | - | - | - |
| CG | Frm | 0.1 | - | 0.8 | -0.1 | - | 0.8 | - | - | - |
| L> | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| <L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S> | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| <S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| W1> | Frm | 4.8 | - | 0.9 | 2.4 | - | -6.5 | - | - | - |
| <W1 | Frm | -2.2 | - | -3.2 | -1.4 | - | -1.1 | - | - | - |
| W2> | Frm | 4.5 | - | 2.5 | 3.0 | - | -5.1 | - | - | - |
| <W2 | Frm | -2.5 | - | -1.6 | -0.8 | - | 0.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| E> | Frm | 0.1 | - | 0.1 | 0.0 | - | -0.1 | - | - | - |
| EG+ | Frm | - | - | 0.0 | - | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | - | -0.1 | -0.0 | - | 0.1 | - | - | - |
| EG- | Frm | - | - | -0.0 | - | - | -0.0 | - | - | - |
| WP | Frm | 0.3 | - | -3.2 | -1.3 | - | -2.1 | - | - | - |
| WB1> | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| <WB1 | Brc | - | -0.3 | -0.0 | - | -0.3 | -0.1 | - | - | - |
| WB2> | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| <WB2 | Brc | - | -0.3 | -0.0 | - | -0.3 | -0.1 | - | - | - |
| EB> | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| <EB | Brc | - | -0.3 | -0.0 | - | -0.2 | -0.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 7- | 2.5 | 12 | 5.0 | 5 | 0.3 | 39 | - | - | 2.8 | 40 | 5.7 | 15 | - | - | - | - |
| 10/4/1 | 7-C | 1.5 | 6 | 2.9 | 11 | 0.3 | 39 | - | - | 6.1 | 9 | 4.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.6 | 1.4 |
| CG | 0.0 | 0.0 | 1.5 | 1.5 |
| L> | 0.0 | 0.0 | 6.1 | 6.1 |
| <L | 0.0 | 0.0 | 6.1 | 6.1 |
| S> | 0.0 | 0.0 | 0.7 | 0.7 |
| <S | 0.0 | 0.0 | 0.7 | 0.7 |
| W1> | 7.2 | 7.2 | 5.6 | 5.6 |
| <W1 | 3.6 | 3.6 | 4.2 | 4.2 |
| W2> | 7.5 | 7.5 | 2.6 | 2.6 |
| <W2 | 3.3 | 3.3 | 1.2 | 1.2 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 6.1 | 6.1 |
| S | 0.0 | 0.0 | 0.7 | 0.7 |





| | | | | |
|---|---|---|---|---|
| E> | 0.2 | 0.2 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.2 | 0.2 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |
| WP | 1.0 | 1.0 | 5.3 | 5.3 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.1 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.1 |
| EB> | 0.0 | 0.0 | 0.0 | 0.1 |
| <EB | 0.0 | 0.0 | 0.0 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 7- | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | 7-C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 5 | -3.8 | 1.1 | 127.7 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.0 | Thin plate | 106.0 | 143.5 |
| 2 | 1 | 5 | -3.8 | 1.1 | 127.7 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.0 | Thin plate | 106.0 | 143.5 |
| 3 | 2 | 16 | 1.2 | 2.6 | 34.8 | Thin plate | 106.0 | 143.5 | 9 | -3.2 | 4.1 | 79.7 | Thin plate | 106.0 | 154.6 |
| 4 | 2 | 16 | 1.2 | 2.6 | 34.8 | Thin plate | 106.0 | 143.5 | 9 | -3.2 | 4.1 | 79.7 | Thin plate | 106.0 | 154.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | FB2050 | |
| 3 | 1/10/5 | 3/11/13 | FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 2.19 | 9.00 | 7 | 5 | -3.9 | -5.0 | -118.5 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.74 | 0.24 |
| 2 | 0.25 | 9.00 | 7 | 15 | -5.1 | 3.1 | -128.0 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.81 | 0.15 |
| 3 | 3.28 | 9.00 | 9 | 9 | -3.2 | 4.1 | 79.7 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.50 | 0.19 |
| 4 | 6.36 | 12.00 | 9 | 11 | 6.1 | -2.9 | 95.9 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.49 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.64 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.31 | 1.00 | 1.15 | 0.59 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 7**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/261 ) | -0.112 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/2244 ) | 0.041 | 2 | 2 | 3 | W1> |

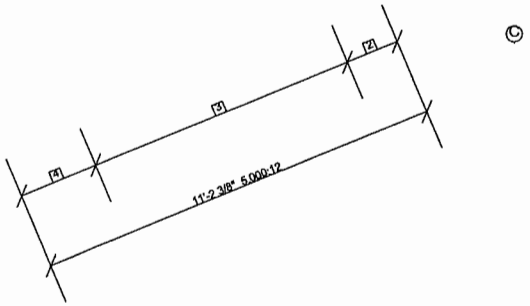
* Negative horizontal deflection is left
* Negative vertical deflection is down

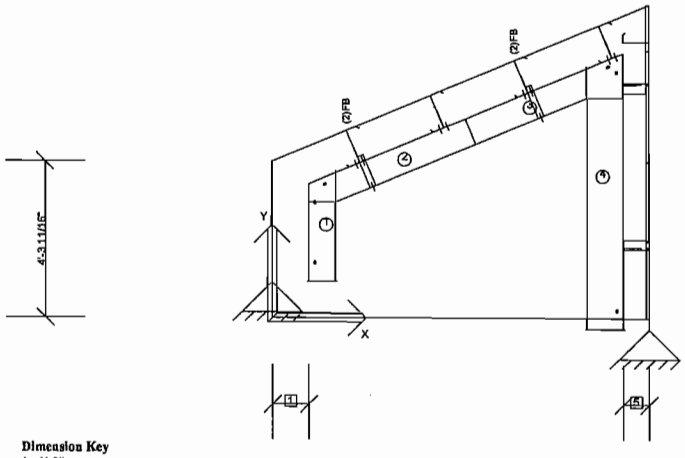
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 2, Frame at: 61/0/0**
Frame Cross Section: 6




**Dimension Key**
1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX316) and 4(CX317): 6'-10 9/16"

Vert. Clearance at member 1(CX316): 3'-1 3/4"
Vert. Clearance at member 4(CX317): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 61/0/0 | 30/0/0 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 249.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 6**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 10/4/1 | | | | | |
| Grid1 - Grid2 | | 6- | | | 6-C | | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 132'-1 1/2" | | | 130'-9 13/16" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 0.1 | - | 0.7 | -0.1 | - | 0.7 | - | - | - |
| CG | Frm | 0.1 | - | 0.8 | -0.1 | - | 0.8 | - | - | - |
| L> | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| <L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S> | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| <S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| W1> | Frm | 4.8 | - | 0.9 | 2.4 | - | -6.6 | - | - | - |
| <W1 | Frm | -2.3 | - | -3.2 | -1.4 | - | -1.1 | - | - | - |
| W2> | Frm | 4.6 | - | 2.6 | 3.0 | - | -5.2 | - | - | - |
| <W2 | Frm | -2.5 | - | -1.6 | -0.8 | - | 0.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| E> | Frm | 0.1 | - | 0.1 | 0.0 | - | -0.1 | - | - | - |
| EG+ | Frm | - | - | 0.0 | - | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | - | -0.1 | -0.0 | - | 0.1 | - | - | - |
| EG- | Frm | - | - | -0.0 | - | - | -0.0 | - | - | - |
| WP | Frm | 0.2 | - | -3.1 | -1.4 | - | -1.8 | - | - | - |
| WB1> | Brc | - | 0.3 | -0.0 | - | 0.2 | -0.1 | - | - | - |
| <WB1 | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| WB2> | Brc | - | 0.3 | -0.0 | - | 0.2 | -0.1 | - | - | - |
| <WB2 | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| EB> | Brc | - | 0.2 | -0.0 | - | 0.2 | -0.1 | - | - | - |
| <EB | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 6- | 2.5 | 12 | 5.0 | 5 | - | - | 0.3 | 27 | 2.8 | 10 | 5.7 | 15 | - | - | - | - |
| 10/4/1 | 6-C | 1.6 | 27 | 3.0 | 11 | - | - | 0.2 | 27 | 6.2 | 9 | 4.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.6 | 1.4 |
| CG | 0.0 | 0.0 | 1.6 | 1.6 |
| L> | 0.0 | 0.0 | 6.2 | 6.2 |
| <L | 0.0 | 0.0 | 6.2 | 6.2 |
| S> | 0.0 | 0.0 | 0.7 | 0.7 |
| <S | 0.0 | 0.0 | 0.7 | 0.7 |
| W1> | 7.3 | 7.3 | 5.7 | 5.7 |
| <W1 | 3.6 | 3.6 | 4.3 | 4.3 |
| W2> | 7.6 | 7.6 | 2.6 | 2.6 |
| <W2 | 3.3 | 3.3 | 1.2 | 1.2 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 6.2 | 6.2 |
| S | 0.0 | 0.0 | 0.7 | 0.7 |





| | | | | |
|---|---|---|---|---|
| E> | 0.2 | 0.2 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.2 | 0.2 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |
| WP | 1.2 | 1.2 | 5.0 | 5.0 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.1 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.1 |
| EB> | 0.0 | 0.0 | 0.0 | 0.1 |
| <EB | 0.0 | 0.0 | 0.0 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 6- | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | 6-C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| | | | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Type | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 5 | -3.9 | 1.1 | 128.9 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.5 | Thin plate | 106.0 | 143.5 |
| 2 | 1 | 5 | -3.9 | 1.1 | 128.9 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.5 | Thin plate | 106.0 | 143.5 |
| 3 | 2 | 16 | 1.2 | 2.6 | 35.2 | Thin plate | 106.0 | 143.5 | 9 | -3.3 | 4.1 | 80.5 | Thin plate | 106.0 | 154.6 |
| 4 | 2 | 16 | 1.2 | 2.6 | 35.2 | Thin plate | 106.0 | 143.5 | 9 | -3.3 | 4.1 | 80.5 | Thin plate | 106.0 | 154.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | (2)FB2050 | |
| 3 | 1/10/5 | 3/11/13 | (2)FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 2.19 | 9.00 | 7 | 5 | -4.0 | -5.0 | -119.6 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.75 | 0.24 |
| 2 | 0.25 | 9.00 | 7 | 15 | -5.2 | 3.1 | -129.3 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.82 | 0.15 |
| 3 | 3.28 | 9.00 | 9 | 9 | -3.3 | 4.1 | 80.5 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.51 | 0.20 |
| 4 | 6.36 | 12.00 | 9 | 11 | 6.1 | -3.0 | 96.9 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.49 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.64 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.31 | 1.00 | 1.15 | 0.59 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section: 6**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/259 ) | -0.113 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/2222 ) | 0.042 | 2 | 2 | 3 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

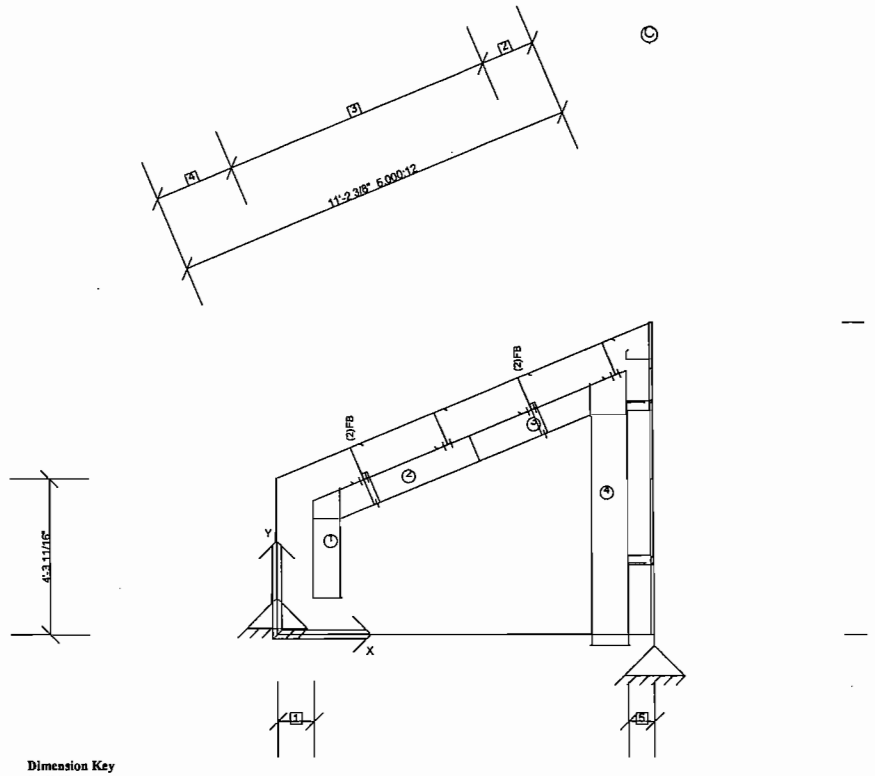
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Wall: 2, Frame at: 91/0/0**

Frame Cross Section: 5




**Dimension Key**

1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**

Horiz. Clearance between members 1(CX314) and 4(CX315): 6'-10 9/16"

Vert. Clearance at member 1(CX314): 3'-1 3/4"
Vert. Clearance at member 4(CX315): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)





**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 91/0/0 | 30/0/0 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 28 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 249.8 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.
**Reactions - Unfactored Load Type at Frame Cross Section: 5**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 10/4/1 | | | | |
| Grid1 - Grid2 | | 5- | | 5-C | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | 8 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 132'-1 1/2" | | 130'-9 13/16" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 0.7 | -0.1 | 0.7 | - | - | - |
| CG | Frm | 0.1 | 0.8 | -0.1 | 0.8 | - | - | - |
| L> | Frm | 0.4 | 3.1 | -0.4 | 3.1 | - | - | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| <L | Frm | 0.4 | 3.1 | -0.4 | 3.1 | - | - | - |
| S> | Frm | 0.0 | 0.4 | -0.0 | 0.4 | - | - | - |
| <S | Frm | 0.0 | 0.4 | -0.0 | 0.4 | - | - | - |
| W1> | Frm | 4.8 | 0.9 | 2.4 | -6.6 | - | - | - |
| <W1 | Frm | -2.3 | -3.2 | -1.4 | -1.1 | - | - | - |
| W2> | Frm | 4.6 | 2.6 | 3.0 | -5.2 | - | - | - |
| <W2 | Frm | -2.5 | -1.6 | -0.8 | 0.3 | - | - | - |
| WP | Frm | 0.2 | -3.1 | -1.4 | -1.8 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 0.4 | 3.1 | -0.4 | 3.1 | - | - | - |
| S | Frm | 0.0 | 0.4 | -0.0 | 0.4 | - | - | - |
| E> | Frm | 0.1 | 0.1 | 0.0 | -0.1 | - | - | - |
| EG+ | Frm | - | 0.0 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | -0.1 | -0.0 | 0.1 | - | - | - |
| EG- | Frm | - | -0.0 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5- | 2.5 | 13 | 5.0 | 5 | - | - | - | - | 2.8 | 11 | 5.7 | 17 | - | - | - | - |
| 10/4/1 | 5-C | 1.6 | 9 | 3.0 | 12 | - | - | - | - | 6.2 | 10 | 4.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.6 | 1.4 |
| CG | 0.0 | 0.0 | 1.6 | 1.6 |
| L> | 0.0 | 0.0 | 6.2 | 6.2 |
| <L | 0.0 | 0.0 | 6.2 | 6.2 |
| S> | 0.0 | 0.0 | 0.7 | 0.7 |
| <S | 0.0 | 0.0 | 0.7 | 0.7 |
| W1> | 7.3 | 7.3 | 5.7 | 5.7 |
| <W1 | 3.6 | 3.6 | 4.3 | 4.3 |
| W2> | 7.6 | 7.6 | 2.6 | 2.6 |
| <W2 | 3.3 | 3.3 | 1.2 | 1.2 |
| WP | 1.2 | 1.2 | 5.0 | 5.0 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 6.2 | 6.2 |
| S | 0.0 | 0.0 | 0.7 | 0.7 |
| E> | 0.2 | 0.2 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.2 | 0.2 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 5- | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | 5-C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |





| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| Mem. No. | Jt. No. | Required Strength - Out | | | | Available Strength - Out | | | Required Strength - In | | | | Available Strength - In | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 5 | -3.9 | 1.1 | 128.9 | Thin plate | 106.0 | 143.5 | 11 | 2.0 | 1.8 | 48.5 | Thin plate | 106.0 | 143.5 |
| 2 | 1 | 5 | -3.9 | 1.1 | 128.9 | Thin plate | 106.0 | 143.5 | 11 | 2.0 | 1.8 | 48.5 | Thin plate | 106.0 | 143.5 |
| 3 | 2 | 18 | 1.2 | 2.6 | 35.2 | Thin plate | 106.0 | 143.5 | 10 | -3.3 | 4.1 | 80.5 | Thin plate | 106.0 | 154.6 |
| 4 | 2 | 18 | 1.2 | 2.6 | 35.2 | Thin plate | 106.0 | 143.5 | 10 | -3.3 | 4.1 | 80.5 | Thin plate | 106.0 | 154.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | (2)FB2050 | |
| 3 | 1/10/5 | 3/11/13 | (2)FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Controlling Cases Shear | Required Strength Axial Pr k | Required Strength Shear Vr k | Required Strength Mom-x Mrx in-k | Required Strength Mom-y Mry in-k | Available Strength Axial Pc k | Available Strength Shear Vc k | Available Strength Mom-x Mcx in-k | Available Strength Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Strength Ratios Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 9.00 | 7 | 5 | -4.0 | -5.0 | -119.6 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.75 | 0.24 |
| 2 | 0.25 | 9.00 | 7 | 17 | -5.2 | 3.1 | -129.3 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.82 | 0.15 |
| 3 | 3.28 | 9.00 | 10 | 10 | -3.3 | 4.1 | 80.5 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.51 | 0.20 |
| 4 | 6.36 | 12.00 | 10 | 12 | 6.1 | -3.0 | 96.9 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.49 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.64 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.31 | 1.00 | 1.15 | 0.59 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

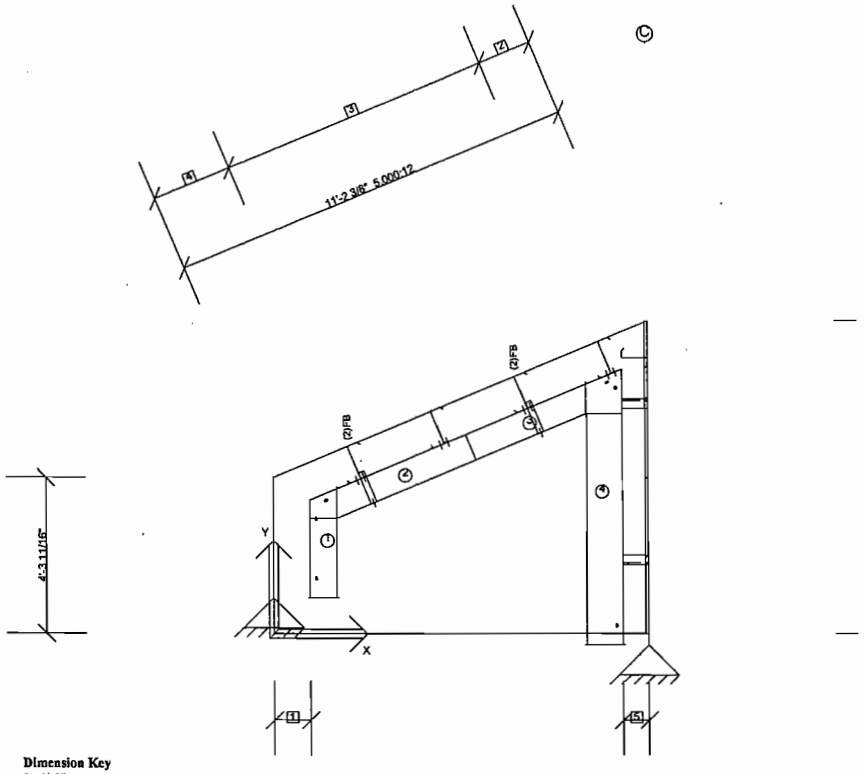
**Controlling Frame Deflection Ratios for Cross Section: 5**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/259 ) | -0.113 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/2222 ) | 0.042 | 2 | 2 | 3 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2, Frame at: 121/0/0**
Frame Cross Section: 4




**Dimension Key**
1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX316) and 4(CX317): 6'-10 9/16"





Vert. Clearance at member 1(CX316): 3'-1 3/4"
Vert. Clearance at member 4(CX317): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 121/0/0 | 30/0/0 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 249.8 (p) (Includes all pieces)





**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 4**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 10/4/1 | | | | | |
| Grid1 - Grid2 | | 4- | | | 4-C | | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 132'-1 1/2" | | | 130'-9 13/16" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 0.1 | - | 0.7 | -0.1 | - | 0.7 | - | - | - |
| CG | Frm | 0.1 | - | 0.8 | -0.1 | - | 0.8 | - | - | - |
| L> | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| <L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S> | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| <S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| W1> | Frm | 4.8 | - | 0.9 | 2.4 | - | -6.6 | - | - | - |
| <W1 | Frm | -2.3 | - | -3.2 | -1.4 | - | -1.1 | - | - | - |
| W2> | Frm | 4.6 | - | 2.6 | 3.0 | - | -5.2 | - | - | - |
| <W2 | Frm | -2.5 | - | -1.6 | -0.8 | - | 0.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| E> | Frm | 0.1 | - | 0.1 | 0.0 | - | -0.1 | - | - | - |
| EG+ | Frm | - | - | 0.0 | - | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | - | -0.1 | -0.0 | - | 0.1 | - | - | - |
| EG- | Frm | - | - | -0.0 | - | - | -0.0 | - | - | - |
| WP | Frm | 0.2 | - | -3.1 | -1.4 | - | -1.8 | - | - | - |
| WB1> | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| <WB1 | Brc | - | -0.3 | -0.0 | - | -0.2 | -0.1 | - | - | - |
| WB2> | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| <WB2 | Brc | - | -0.3 | -0.0 | - | -0.2 | -0.1 | - | - | - |
| EB> | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| <EB | Brc | - | -0.2 | -0.0 | - | -0.2 | -0.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 4- | 2.5 | 12 | 5.0 | 5 | 0.3 | 31 | - | - | 2.8 | 10 | 5.7 | 15 | - | - | - | - |
| 10/4/1 | 4-C | 1.6 | 27 | 3.0 | 11 | 0.2 | 31 | - | - | 6.2 | 9 | 4.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.6 | 1.6 |
| CG | 0.0 | 0.0 | 1.6 | 1.6 |
| L> | 0.0 | 0.0 | 6.2 | 6.2 |
| <L | 0.0 | 0.0 | 6.2 | 6.2 |
| S> | 0.0 | 0.0 | 0.7 | 0.7 |
| <S | 0.0 | 0.0 | 0.7 | 0.7 |
| W1> | 7.3 | 7.3 | 5.7 | 5.7 |
| <W1 | 3.6 | 3.6 | 4.3 | 4.3 |
| W2> | 7.6 | 7.6 | 2.6 | 2.6 |
| <W2 | 3.3 | 3.3 | 1.2 | 1.2 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 6.2 | 6.2 |
| S | 0.0 | 0.0 | 0.7 | 0.7 |

| | | | | |
|---|---|---|---|---|
| E> | 0.2 | 0.2 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.2 | 0.2 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |
| WP | 1.2 | 1.2 | 5.0 | 5.0 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.1 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.1 |
| EB> | 0.0 | 0.0 | 0.0 | 0.1 |
| <EB | 0.0 | 0.0 | 0.0 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 4- | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | 4-C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions Thick. (in.) | Width (in.) | Length (in.) | Bolt Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Outside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Inside Flange Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| Mem. No. | Jt. No. | Required Strength - Out Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - Out Design Proc. | Shear (k) | Moment (in-k) | Required Strength - In Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Available Strength - In Design Proc. | Shear (k) | Moment (in-k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 5 | -3.9 | 1.1 | 128.9 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.5 | Thin plate | 106.0 | 143.5 |
| 2 | 1 | 5 | -3.9 | 1.1 | 128.9 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.5 | Thin plate | 106.0 | 143.5 |
| 3 | 2 | 16 | 1.2 | 2.6 | 35.2 | Thin plate | 106.0 | 143.5 | 9 | -3.3 | 4.1 | 80.5 | Thin plate | 106.0 | 154.6 |
| 4 | 2 | 16 | 1.2 | 2.6 | 35.2 | Thin plate | 106.0 | 143.5 | 9 | -3.3 | 4.1 | 80.5 | Thin plate | 106.0 | 154.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | (2)FB2050 | |
| 3 | 1/10/5 | 3/11/13 | (2)FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1 )**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Shear | Required Strength Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Available Strength Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 9.00 | 7 | 5 | -4.0 | -5.0 | -119.6 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.75 | 0.24 |
| 2 | 0.25 | 9.00 | 7 | 15 | -5.2 | 3.1 | -129.3 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.82 | 0.15 |
| 3 | 3.28 | 9.00 | 9 | 9 | -3.3 | 4.1 | 80.5 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.51 | 0.20 |
| 4 | 6.36 | 12.00 | 9 | 11 | 6.1 | -3.0 | 96.9 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.49 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.64 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.31 | 1.00 | 1.15 | 0.59 | 1.00 |





**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

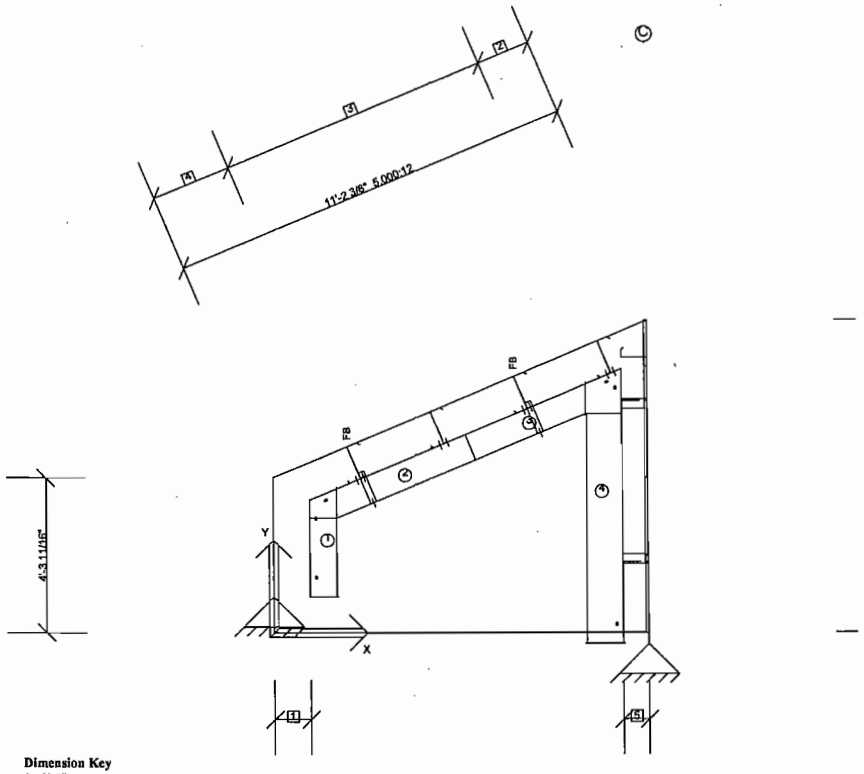
**Controlling Frame Deflection Ratios for Cross Section: 4**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/259 ) | -0.113 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/2222 ) | 0.042 | 2 | 2 | 3 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably oversized.

**Wall: 2, Frame at: 151/0/0**
Frame Cross Section: 3




**Dimension Key**
1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX316) and 4(CX317): 6'-10 9/16"



*Design Reports - mde - 6 Apr 09*



Vert. Clearance at member 1(CX316): 3'-1 3/4"
Vert. Clearance at member 4(CX317): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 151/0/0 | 29/8/8 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 13 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 14 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 23 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 24 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |
| 27 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB1> | D + CG + WP + WB1> |
| 28 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB1> | D + CU + WP + WB1> |
| 29 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB1> | D + CG + L + WP + WB1> |
| 30 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB1> | D + CG + S + WP + WB1> |
| 31 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB1 | D + CG + WP + <WB1 |
| 32 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB1 | D + CU + WP + <WB1 |
| 33 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB1 | D + CG + L + WP + <WB1 |
| 34 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB1 | D + CG + S + WP + <WB1 |
| 35 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 WB2> | D + CG + WP + WB2> |
| 36 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 WB2> | D + CU + WP + WB2> |
| 37 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 WB2> | D + CG + L + WP + WB2> |
| 38 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 WB2> | D + CG + S + WP + WB2> |
| 39 | System Derived | 1.000 | 1.0 D + 1.0 CG + 1.0 WP + 1.0 <WB2 | D + CG + WP + <WB2 |
| 40 | System Derived | 1.000 | 0.600 D + 0.600 CU + 1.0 WP + 1.0 <WB2 | D + CU + WP + <WB2 |
| 41 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP + 0.750 <WB2 | D + CG + L + WP + <WB2 |
| 42 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP + 0.750 <WB2 | D + CG + S + WP + <WB2 |
| 43 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 EB> + 0.700 EG+ | D + CG + EB> + EG+ |
| 44 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 EB> + 0.700 EG- | D + CU + EB> + EG- |
| 45 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 EB> + 0.525 EG+ | D + CG + EB> + EG+ |
| 46 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.700 <EB + 0.700 EG+ | D + CG + <EB + EG+ |
| 47 | System Derived | 1.000 | 0.600 D + 0.600 CU + 0.700 <EB + 0.700 EG- | D + CU + <EB + EG- |
| 48 | System Derived | 1.000 | 1.0 D + 1.0 CG + 0.525 <EB + 0.525 EG+ | D + CG + <EB + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 241.1 (p) (Includes all pieces)



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**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section: 3**

| Type | | Exterior Column | | | Exterior Column | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | | 10/4/1 | | | | | |
| Grid1 - Grid2 | | 3- | | | 3-C | | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | | 8 x 13 | | | | | |
| Base Plate Thickness (in.) | | 0.375 | | | 0.375 | | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | | 4 - 0.750 | | | | | |
| Column Base Elev. | | 132'-1 1/2" | | | 130'-9 13/16" | | | | | |
| Load Type | Desc. | Hx | Hz | Vy | Hx | Hz | Vy | | | |
| D | Frm | 0.1 | - | 0.7 | -0.1 | - | 0.7 | - | - | - |
| CG | Frm | 0.1 | - | 0.8 | -0.1 | - | 0.8 | - | - | - |
| L> | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| <L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S> | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| <S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| W1> | Frm | 4.8 | - | 0.9 | 2.4 | - | -6.5 | - | - | - |
| <W1 | Frm | -2.2 | - | -3.2 | -1.4 | - | -1.1 | - | - | - |
| W2> | Frm | 4.5 | - | 2.5 | 3.0 | - | -5.1 | - | - | - |
| <W2 | Frm | -2.5 | - | -1.6 | -0.8 | - | 0.3 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - | - | - |
| L | Frm | 0.4 | - | 3.1 | -0.4 | - | 3.1 | - | - | - |
| S | Frm | 0.0 | - | 0.4 | -0.0 | - | 0.4 | - | - | - |
| E> | Frm | 0.1 | - | 0.1 | 0.0 | - | -0.1 | - | - | - |
| EG+ | Frm | - | - | 0.0 | - | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | - | -0.1 | -0.0 | - | 0.1 | - | - | - |
| EG- | Frm | - | - | -0.0 | - | - | -0.0 | - | - | - |
| WP | Frm | 0.3 | - | -3.2 | -1.3 | - | -2.1 | - | - | - |
| WB1> | Brc | - | 0.3 | -0.0 | - | 0.3 | -0.1 | - | - | - |
| <WB1 | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| WB2> | Brc | - | 0.3 | -0.0 | - | 0.3 | -0.1 | - | - | - |
| <WB2 | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |
| EB> | Brc | - | 0.3 | -0.0 | - | 0.2 | -0.1 | - | - | - |
| <EB | Brc | - | - | 0.0 | - | - | 0.1 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3- | 2.5 | 12 | 5.0 | 5 | - | - | 0.3 | 35 | 2.8 | 36 | 5.7 | 15 | - | - | - | - |
| 10/4/1 | 3-C | 1.5 | 6 | 2.9 | 11 | - | - | 0.3 | 35 | 6.1 | 9 | 4.6 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.6 | 1.4 |
| CG | 0.0 | 0.0 | 1.5 | 1.5 |
| L> | 0.0 | 0.0 | 6.1 | 6.1 |
| <L | 0.0 | 0.0 | 6.1 | 6.1 |
| S> | 0.0 | 0.0 | 0.7 | 0.7 |
| <S | 0.0 | 0.0 | 0.7 | 0.7 |
| W1> | 7.2 | 7.2 | 5.6 | 5.6 |
| <W1 | 3.6 | 3.6 | 4.2 | 4.2 |
| W2> | 7.5 | 7.5 | 2.6 | 2.6 |
| <W2 | 3.3 | 3.3 | 1.2 | 1.2 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 6.1 | 6.1 |
| S | 0.0 | 0.0 | 0.7 | 0.7 |

| | | | | |
|---|---|---|---|---|
| E> | 0.2 | 0.2 | 0.0 | 0.1 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.2 | 0.2 | 0.0 | 0.1 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |
| WP | 1.0 | 1.0 | 5.3 | 5.3 |
| WB1> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB1 | 0.0 | 0.0 | 0.0 | 0.1 |
| WB2> | 0.0 | 0.0 | 0.0 | 0.1 |
| <WB2 | 0.0 | 0.0 | 0.0 | 0.1 |
| EB> | 0.0 | 0.0 | 0.0 | 0.1 |
| <EB | 0.0 | 0.0 | 0.0 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | 3- | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | 3-C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | | |
| 1 | 2 | 5 | -3.8 | 1.1 | 127.7 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.0 | Thin plate | 106.0 | 143.5 | | |
| 2 | 1 | 5 | -3.8 | 1.1 | 127.7 | Thin plate | 106.0 | 143.5 | 10 | 2.0 | 1.8 | 48.0 | Thin plate | 106.0 | 143.5 | | |
| 3 | 2 | 16 | 1.2 | 2.6 | 34.8 | Thin plate | 106.0 | 143.5 | 9 | -3.2 | 4.1 | 79.7 | Thin plate | 106.0 | 154.6 | | |
| 4 | 2 | 16 | 1.2 | 2.6 | 34.8 | Thin plate | 106.0 | 143.5 | 9 | -3.2 | 4.1 | 79.7 | Thin plate | 106.0 | 154.6 | | |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | FB2050 | |
| 3 | 1/10/5 | 3/11/13 | FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| Mem. No. | Loc. ft | Depth in. | Controlling Cases Axial + Flexure | Controlling Cases Shear | Required Strength Axial Pr k | Required Strength Shear Vr k | Required Strength Mom-x Mrx in-k | Required Strength Mom-y Mry in-k | Available Strength Axial Pc k | Available Strength Shear Vc k | Available Strength Mom-x Mcx in-k | Available Strength Mom-y Mcy in-k | Strength Ratios Axial + Flexure | Strength Ratios Shear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 9.00 | 7 | 5 | -3.9 | -5.0 | -118.5 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.74 | 0.24 |
| 2 | 0.25 | 9.00 | 7 | 15 | -5.1 | 3.1 | -128.0 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.81 | 0.15 |
| 3 | 3.28 | 9.00 | 9 | 9 | -3.2 | 4.1 | 79.7 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.50 | 0.19 |
| 4 | 6.36 | 12.00 | 9 | 11 | 6.1 | -2.9 | 95.9 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.49 | 0.18 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.64 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.31 | 1.00 | 1.15 | 0.59 | 1.00 |





**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

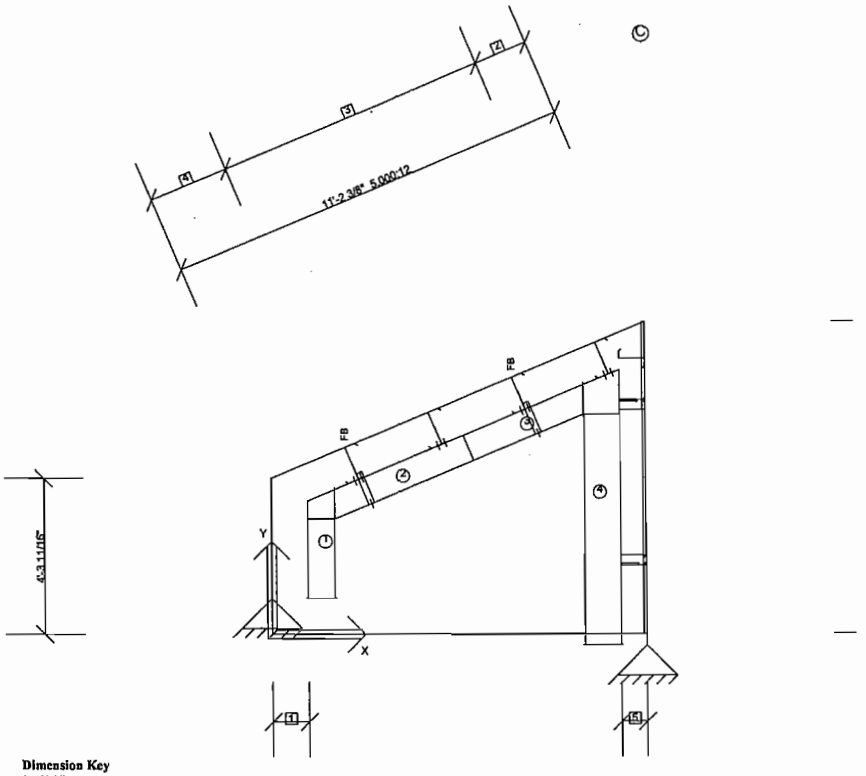
**Controlling Frame Deflection Ratios for Cross Section: 3**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/261 ) | -0.112 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/2244 ) | 0.041 | 2 | 2 | 3 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.

**Wall: 2, Frame at: 180/5/0**
Frame Cross Section:




**Dimension Key**
1 1'-0"
2 1'-5 13/16"
3 3 @ 2'-6"
4 2'-2 9/16"
5 8 1/2"
6 2'-2"
7 4'-0 1/4"
8 1'-4 7/8"
9 1'-0 1/4"

**Frame Clearances**
Horiz. Clearance between members 1(CX314) and 4(CX315): 6'-10 9/16"





Vert. Clearance at member 1(CX314): 3'-1 3/4"
Vert. Clearance at member 4(CX315): 6'-0 1/8"
Finished Floor Elevation = 131'-1 1/2" (Unless Noted Otherwise)

**Frame Location Design Parameters:**

| Location | Avg. Bay Space | Description | Angle | Group | Trib. Override | Design Status |
|---|---|---|---|---|---|---|
| 180/5/0 | 16/3/8 | Clerestory Frame | 90.0000 | | - | Automatic Design |

**Design Load Combinations - Framing**

| No. | Origin | Factor | Application | Description |
|---|---|---|---|---|
| 1 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 L> | D + CG + L> |
| 2 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <L | D + CG + <L |
| 3 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 S> | D + CG + S> |
| 4 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <S | D + CG + <S |
| 5 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W1> | D + CG + W1> |
| 6 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W1 | D + CG + <W1 |
| 7 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 W2> | D + CG + W2> |
| 8 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 <W2 | D + CG + <W2 |
| 9 | System | 1.000 | 1.0 D + 1.0 CG + 1.0 WP | D + CG + WP |
| 10 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W1> | D + CU + W1> |
| 11 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W1 | D + CU + <W1 |
| 12 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 W2> | D + CU + W2> |
| 13 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 <W2 | D + CU + <W2 |
| 14 | System | 1.000 | 0.600 D + 0.600 CU + 1.0 WP | D + CU + WP |
| 15 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W1> | D + CG + L + W1> |
| 16 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W1 | D + CG + L + <W1 |
| 17 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 W2> | D + CG + L + W2> |
| 18 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 <W2 | D + CG + L + <W2 |
| 19 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 L + 0.750 WP | D + CG + L + WP |
| 20 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W1> | D + CG + S + W1> |
| 21 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W1 | D + CG + S + <W1 |
| 22 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 W2> | D + CG + S + W2> |
| 23 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 <W2 | D + CG + S + <W2 |
| 24 | System | 1.000 | 1.0 D + 1.0 CG + 0.750 S + 0.750 WP | D + CG + S + WP |
| 25 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 E> + 0.700 EG+ | D + CG + E> + EG+ |
| 26 | System | 1.000 | 1.0 D + 1.0 CG + 0.700 <E + 0.700 EG+ | D + CG + <E + EG+ |
| 27 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 E> + 0.700 EG- | D + CU + E> + EG- |
| 28 | System | 1.000 | 0.600 D + 0.600 CU + 0.700 <E + 0.700 EG- | D + CU + <E + EG- |
| 29 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 E> + 0.525 EG+ | D + CG + E> + EG+ |
| 30 | System | 1.000 | 1.0 D + 1.0 CG + 0.525 <E + 0.525 EG+ | D + CG + <E + EG+ |

**Frame Member Sizes**

| Mem. No. | Flg Width (in.) | Flg Thk (in.) | Web Thk (in.) | Depth1 (in.) | Depth2 (in.) | Length (ft) | Weight (p) | Flg Fy (ksi) | Web Fy (ksi) | Splice Jt.1 | Codes Jt.2 | Shape |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 2.69 | 38.9 | 55.00 | 55.00 | BP | KN | 3P |
| 2 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 41.1 | 55.00 | 55.00 | KN | SS | 3P |
| 3 | 5.00 | 0.1345 | 0.1345 | 9.00 | 9.00 | 4.67 | 35.9 | 55.00 | 55.00 | SS | KN | 3P |
| 4 | 5.00 | 0.1345 | 0.1345 | 12.00 | 12.00 | 7.59 | 91.0 | 55.00 | 55.00 | BP | KN | 3P |

Total Frame Weight = 206.9 (p) (Includes all plates)
Frame Pricing Weight = 241.1 (p) (Includes all pieces)

**Boundary Condition Summary**

| Member | X-Loc | Y-Loc | Supp. X | Supp. Y | Moment | Displacement X(in.) | Displacement Y(in.) | Displacement ZZ(rad.) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0/0/0 | 1/0/0 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |
| 4 | 10/4/1 | -0/3/11 | Yes | Yes | No | 0/0/0 | 0/0/0 | 0.0000 |

Values shown are resisting forces of the foundation.

**Reactions - Unfactored Load Type at Frame Cross Section:**

| Type | | Exterior Column | | Exterior Column | | | | |
|---|---|---|---|---|---|---|---|---|
| X-Loc | | 0/0/0 | | 10/4/1 | | | | |
| Grid1 - Grid2 | | - | | -C | | | | |
| Base Plate W x L (in.) | | 8 x 10 | | 8 x 13 | | | | |
| Base Plate Thickness (in.) | | 0.375 | | 0.375 | | | | |
| Anchor Rod Qty/Diam. (in.) | | 4 - 0.750 | | 4 - 0.750 | | | | |
| Column Base Elev. | | 132'-1 1/2" | | 130'-9 13/16" | | | | |
| Load Type | Desc. | Hx | Vy | Hx | Vy | | | |
| D | Frm | 0.1 | 0.4 | -0.1 | 0.5 | - | - | - |
| CG | Frm | 0.1 | 0.4 | -0.1 | 0.4 | - | - | - |
| L> | Frm | 0.2 | 1.8 | -0.2 | 1.8 | - | - | - |





| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| <L | Frm | 0.2 | 1.8 | -0.2 | 1.8 | - | - | - |
| S> | Frm | 0.0 | 0.2 | -0.0 | 0.2 | - | - | - |
| <S | Frm | 0.0 | 0.2 | -0.0 | 0.2 | - | - | - |
| W1> | Frm | 2.7 | 0.5 | 1.3 | -3.7 | - | - | - |
| <W1 | Frm | -1.1 | -1.8 | -0.7 | -0.8 | - | - | - |
| W2> | Frm | 2.5 | 1.4 | 1.7 | -2.9 | - | - | - |
| <W2 | Frm | -1.3 | -0.9 | -0.4 | -0.1 | - | - | - |
| WP | Frm | 0.5 | -2.0 | -0.6 | -2.1 | - | - | - |
| CU | Frm | - | - | - | - | - | - | - |
| L | Frm | 0.2 | 1.8 | -0.2 | 1.8 | - | - | - |
| S | Frm | 0.0 | 0.2 | -0.0 | 0.2 | - | - | - |
| E> | Frm | 0.1 | 0.1 | 0.0 | -0.0 | - | - | - |
| EG+ | Frm | - | 0.0 | - | 0.0 | - | - | - |
| <E | Frm | -0.1 | -0.1 | -0.0 | 0.0 | - | - | - |
| EG- | Frm | - | -0.0 | - | -0.0 | - | - | - |

**Maximum Combined Reactions Summary with Factored Loads - Framing**

Note: All reactions based on 2nd order structural analysis using the Direct Analysis Method

| X-Loc | Grid | Hrz left (-Hx) (k) | Load Case | Hrz Right (Hx) (k) | Load Case | Hrz In (-Hz) (k) | Load Case | Hrz Out (Hz) (k) | Load Case | Uplift (-Vy) (k) | Load Case | Vrt Down (Vy) (k) | Load Case | Mom cw (-Mzz) (in-k) | Load Case | Mom ccw (Mzz) (in-k) | Load Case |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | - | 1.3 | 13 | 2.8 | 5 | - | - | - | - | 1.7 | 14 | 3.2 | 17 | - | - | - | - |
| 10/4/1 | -C | 0.8 | 6 | 1.6 | 12 | - | - | - | - | 3.4 | 10 | 2.7 | 1 | - | - | - | - |

**Sum of Forces with Reactions Check - Framing**

| Load Type | Horizontal | | Vertical | |
|---|---|---|---|---|
| | Load (k) | Reaction (k) | Load (k) | Reaction (k) |
| D | 0.0 | 0.0 | 1.0 | 0.9 |
| CG | 0.0 | 0.0 | 0.9 | 0.9 |
| L> | 0.0 | 0.0 | 3.6 | 3.6 |
| <L | 0.0 | 0.0 | 3.6 | 3.6 |
| S> | 0.0 | 0.0 | 0.4 | 0.4 |
| <S | 0.0 | 0.0 | 0.4 | 0.4 |
| W1> | 4.0 | 4.0 | 3.2 | 3.2 |
| <W1 | 1.8 | 1.8 | 2.7 | 2.7 |
| W2> | 4.2 | 4.2 | 1.6 | 1.6 |
| <W2 | 1.7 | 1.7 | 1.0 | 1.0 |
| WP | 0.1 | 0.1 | 4.1 | 4.1 |
| CU | 0.0 | 0.0 | 0.0 | 0.0 |
| L | 0.0 | 0.0 | 3.6 | 3.6 |
| S | 0.0 | 0.0 | 0.4 | 0.4 |
| E> | 0.1 | 0.1 | 0.0 | 0.0 |
| EG+ | 0.0 | 0.0 | 0.1 | 0.1 |
| <E | 0.1 | 0.1 | 0.0 | 0.0 |
| EG- | 0.0 | 0.0 | 0.1 | 0.1 |

**Base Plate Summary**

| X-Loc | Grid | Mem. No. | Thickness (in.) | Width (in.) | Length (in.) | Num. Of Bolts | Bolt Diam. (in.) | Type | Welds to Flange | Welds to Web |
|---|---|---|---|---|---|---|---|---|---|---|
| 0/0/0 | - | 1 | 0.375 | 8 | 10 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |
| 10/4/1 | -C | 4 | 0.375 | 8 | 13 | 4 | 0.750 | A36 | OS-0.1875 | OS-0.1875 |

**Web Stiffener Summary**

| Mem. No. | Stiff. No. | Desc. | Loc. (ft) | Web Depth (in.) | h/t | a/h | a (in.) | Thick. (in.) | Width (in.) | Side | Welding Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | S3 | 2.15 | 8.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |
| 4 | 1 | S3 | 6.33 | 11.731 | N/A | N/A | N/A | 0.1875 | 2.000 | Both | F-FP,W-OS-0.1875 |

**Bolted End-Plate Moment Connections (AISC DG-16) - Fy = 55 ksi**

| Mem. No. | Jt. No. | Type | End-Plate Dimensions | | | Bolt | | | Outside Flange | | | Inside Flange | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Thick. (in.) | Width (in.) | Length (in.) | Diam. (in.) | Spec/Joint | Gages In/Out (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) | Configuration ID | Configuration Desc. | Pitches 1st/2nd (in.) |
| 1 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 2.00 | 11 | Flush | 2.00 |
| 3 | 2 | KN(Face) | 0.375 | 6.00 | 10.59 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |
| 4 | 2 | KN(Face) | 0.375 | 6.00 | 10.91 | 0.750 | A325X/ST | 3.00 | 11 | Flush | 0.00 | 11 | Flush | 0.00 |

| | | Required Strength - Out | | | | Available Strength - Out | | | | Required Strength - In | | | | Available Strength - In | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Jt. No. | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) | Ld Cs | Axial (k) | Shear (k) | Moment (in-k) | Design Proc. | Shear (k) | Moment (in-k) |
| 1 | 2 | 5 | -2.2 | 0.6 | 71.5 | Thin plate | 106.0 | 143.5 | 11 | 1.0 | 1.0 | 23.7 | Thin plate | 106.0 | 143.5 |
| 2 | 1 | 5 | -2.2 | 0.6 | 71.5 | Thin plate | 106.0 | 143.5 | 11 | 1.0 | 1.0 | 23.7 | Thin plate | 106.0 | 143.5 |
| 3 | 2 | 18 | 0.6 | 1.4 | 17.8 | Thin plate | 106.0 | 143.5 | 10 | -1.8 | 2.3 | 44.9 | Thin plate | 106.0 | 154.6 |
| 4 | 2 | 18 | 0.6 | 1.4 | 17.8 | Thin plate | 106.0 | 143.5 | 10 | -1.8 | 2.3 | 44.9 | Thin plate | 106.0 | 154.6 |

**Flange Brace Summary**

| Member | From Member Joint 1 | From Side Point 1 | Part | Design Note |
|---|---|---|---|---|
| 2 | 0/8/10 | 8/11/13 | FB2050 | |
| 3 | 1/10/5 | 3/11/13 | FB2050 | |

**Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)**

| | | | Controlling Cases | | Required Strength | | | | Available Strength | | | | Strength Ratios | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mem. No. | Loc. ft | Depth in. | Axial + Flexure | Shear | Axial Pr k | Shear Vr k | Mom-x Mrx in-k | Mom-y Mry in-k | Axial Pc k | Shear Vc k | Mom-x Mcx in-k | Mom-y Mcy in-k | Axial + Flexure | Shear |
| 1 | 2.19 | 9.00 | 7 | 5 | -2.2 | -2.8 | -66.3 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.41 | 0.13 |
| 2 | 0.25 | 9.00 | 7 | 17 | -2.9 | 1.8 | -71.6 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.45 | 0.08 |
| 3 | 3.28 | 9.00 | 10 | 10 | -1.8 | 2.3 | 44.9 | 0.0 | 49.1 | 20.9 | 169.5 | 39.0 | 0.28 | 0.11 |
| 4 | 6.36 | 12.00 | 10 | 12 | 3.4 | -1.6 | 54.0 | 0.0 | 90.5 | 16.7 | 211.7 | 39.0 | 0.27 | 0.10 |

| Mem. No. | Loc. ft | Lx in. | Ly/Lt in. | Lb in. | Ag in.2 | Afn in.2 | Ixx in.4 | Iyy in.4 | Sx in.3 | Sy in.3 | Zx in.3 | Zy in.3 | J in.4 | Cw in.6 | Cb | Rpg | Rpc | Qs | Qa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.19 | 26.22 | 26.2 | 26.2 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.65 | 1.00 | 1.13 | 0.67 | 0.88 |
| 2 | 0.25 | 89.44 | 6.0 | 6.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.00 | 1.00 | 1.13 | 0.67 | 0.88 |
| 3 | 3.28 | 89.44 | 17.0 | 17.0 | 2.52 | 2.52 | 33.89 | 2.80 | 7.53 | 1.12 | 8.53 | 1.72 | 0.02 | 55.09 | 1.49 | 1.00 | 1.13 | 0.67 | 0.88 |
| 4 | 6.36 | 76.31 | 76.3 | 76.3 | 2.92 | 2.92 | 65.44 | 2.80 | 10.91 | 1.12 | 12.61 | 1.73 | 0.02 | 98.71 | 1.32 | 1.00 | 1.15 | 0.59 | 1.00 |

**Deflection Load Combinations - Framing**

| No. | Origin | Factor | Def H | Def V | Application | Description |
|---|---|---|---|---|---|---|
| 1 | System | 1.000 | 0 | 240 | 1.0 L | L |
| 2 | System | 1.000 | 0 | 240 | 1.0 S | S |
| 3 | System | 1.000 | 0 | 240 | 0.700 W1> | W1> |
| 4 | System | 1.000 | 0 | 240 | 0.700 <W1 | <W1 |
| 5 | System | 1.000 | 0 | 240 | 0.700 W2> | W2> |
| 6 | System | 1.000 | 0 | 240 | 0.700 <W2 | <W2 |
| 7 | System | 1.000 | 0 | 240 | 0.700 WP | WP |
| 8 | System | 1.000 | 200 | 0 | 0.700 W1> | W1> |
| 9 | System | 1.000 | 200 | 0 | 0.700 <W1 | <W1 |
| 10 | System | 1.000 | 200 | 0 | 0.700 W2> | W2> |
| 11 | System | 1.000 | 200 | 0 | 0.700 <W2 | <W2 |
| 12 | System | 1.000 | 200 | 0 | 0.700 WP | WP |
| 13 | System | 1.000 | 50 | 0 | 1.0 E> + 1.0 EG- | E> + EG- |
| 14 | System | 1.000 | 50 | 0 | 1.0 <E + 1.0 EG- | <E + EG- |

**Controlling Frame Deflection Ratios for Cross Section:**

| Description | Ratio | Deflection (in.) | Member | Joint | Load Case | Load Case Description |
|---|---|---|---|---|---|---|
| Max. Horizontal Deflection | ( H/465 ) | -0.063 | 1 | 2 | 8 | W1> |
| Max. Vertical Deflection for Span 1 | ( L/3966 ) | 0.023 | 2 | 2 | 3 | W1> |

* Negative horizontal deflection is left
* Negative vertical deflection is down

Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms. Therefore, these deflections may be considerably overstated.





**Covering - Expanded Report**

**Shape: Boat Storage Building**

**Loads and Codes - Shape: Boat Storage Building**

**City:** Stennis Space Center **County:** Hancock **State:** Mississippi **Country:** United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf

Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Primaries Wind Exposure (Factor): B (0.680)
Parts Wind Exposure Factor: 0.701

Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region
Impact Resistant Covering
Base Elevation: 0/0/0
Primary Zone Strip Width: N/A
Parts / Portions Zone Strip Width: N/A
Basic Wind Pressure: 24.99,(Parts) 25.76 psf

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Unobstructed, Slippery Roof

**Seismic Load**
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Hazard / Use Group: Group 1

Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.3330
Bracing Seismic Period: 0.2037
Framing R-Factor: 3.0000
Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Covering Design Loads - Roof: A**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -0/11/6 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 2.30 | -0/11/6 | 86.000 | 0.03 | IN | 1.000 |
| Entire Surface | psf | *US1 | Standard Spacing is Adequate | 2.30 | -0/11/6 | 86.000 | 0.03 | IN | 1.000 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | -1/1/8 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | -1/1/8 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | -1/1/8 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | -1/1/8 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 0/0/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | -1/1/8 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -1/1/8 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 178/5/2 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 178/5/2 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 182/0/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 182/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | -1/1/8 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | -1/1/8 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 3/6/14 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 3/6/14 | 86.000 | 0.22 | IN | 0.680 |



UFC's REQUIRE 36" MAX SSR CLIP SPACING @ ALL CZ, EDGE Z's ⇒

5) 12/10/8
12/6/4 = 4

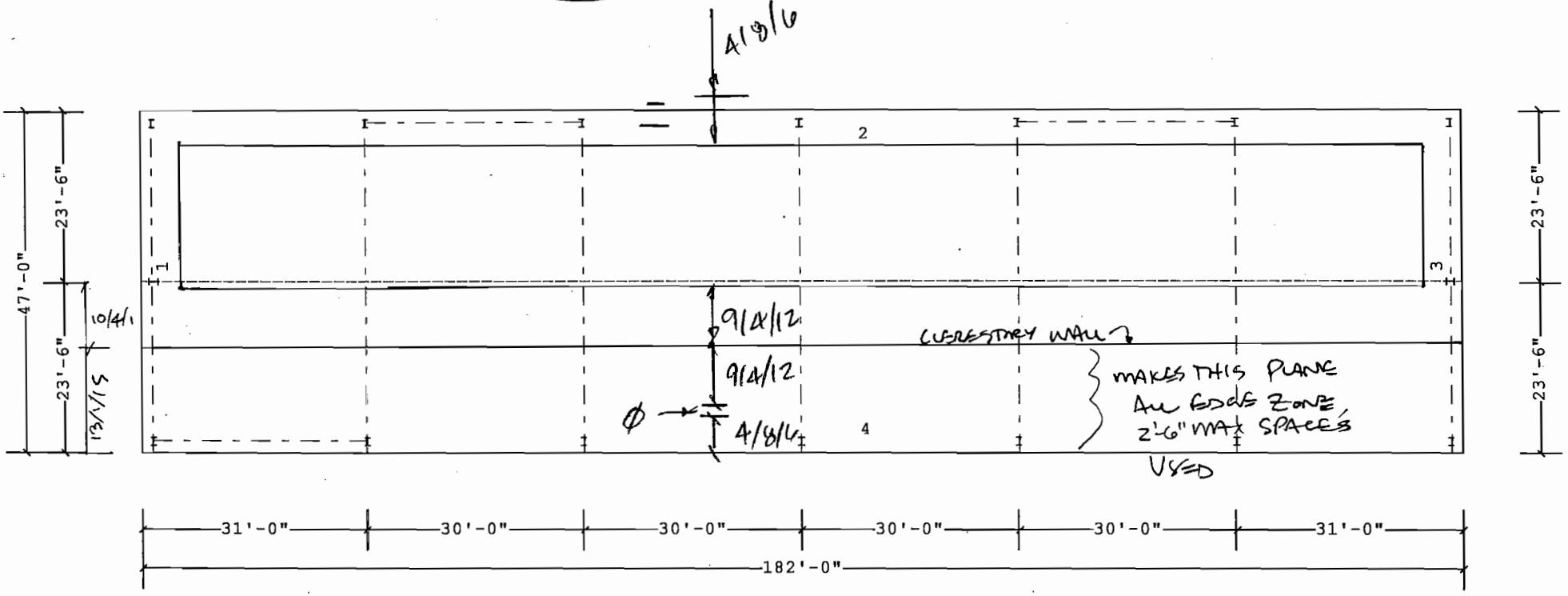
$a = 4/8/6 = 10\%\ (47')$

$2a = 9/4/12$

$14/11/2$

ZONE CALC FOR MODIFIED ZONE DIMS

SEE: UFC 3-110-03
4-8 ( PG 26, 27)




6/10/10
4/8
1/9/7
9/0/9 ( 3 =

3/0/5
10/7
9/7
4/0/3

9/4/12

1/5/2
9/7
2/2/9

**Covering Design Loads - Roof: B**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -0/11/6 | 86.000 | 0.25 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 4.10 | -0/11/6 | 86.000 | 0.05 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 4.10 | -0/11/6 | 86.000 | 0.05 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 15.11 | -0/11/6 | 86.000 | 0.18 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 3/9/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 3/9/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | -0/11/6 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | -0/11/6 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 0/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 0/0/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 0/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 0/0/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 178/3/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 178/3/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 178/3/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 178/3/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 182/0/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 182/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 182/0/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 182/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 54.88 | 182/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 182/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/6/0 Required | 74.98 | 182/0/0 | 75.000 | 1.00 | OUT | -2.980 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 182/0/0 | 86.000 | 0.22 | IN | 0.680 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 93.53 | 182/0/0 | 99.000 | 0.94 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 14.68 | 182/0/0 | 86.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.64 | 178/3/0 | 57.000 | 0.82 | OUT | -1.880 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 19.32 | 178/3/0 | 86.000 | 0.22 | IN | 0.680 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 26.02 | 3/9/0 | 57.000 | 0.46 | OUT | -1.080 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 19.32 | 3/9/0 | 86.000 | 0.22 | IN | 0.680 |

**Covering Design Loads - Wall: 2 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 0/0/0 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |
| Corner Zone | psf | W1> | No Resolution Available | 93.53 | 179/2/6 | -1.000 | | OUT | -3.700 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 179/2/6 | 74.000 | 0.20 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 54.88 | 4/8/6 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 4/8/6 | 74.000 | 0.20 | IN | 0.500 |

**Covering Design Loads - Wall: 4 - Canopy: 1**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | 0/0/0 | 74.000 | 0.29 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Entire Surface | psf | US1* | Standard Spacing is Adequate | 5.06 | 0/0/0 | 74.000 | 0.07 | IN | 1.000 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 54.88 | 0/0/0 | 57.000 | 0.96 | OUT | -2.200 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 14.68 | 0/0/0 | 74.000 | 0.20 | IN | 0.500 |





**Panel Data**

| Wall/Roof | Type | Thickness | Finish | Color | Direction | Gable Dir | Max. Length |
|---|---|---|---|---|---|---|---|
| Wall: 1 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Wall: 2 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Canopy: 1 | SLR2 | 22 | Galvalume | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Wall: 3 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Wall: 4 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Location: 2 | NBVP - Masonry | 11 1/4" | | Supported by others=no | | | |
| Canopy: 2 | SLR2 | 22 | Galvalume | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Roof: A | SLR2 | 22 | Galvalume | Standard Color | System Generated | Not Applicable | 40/0/0 |
| Roof: B | SLR2 | 22 | Galvalume | Standard Color | System Generated | Not Applicable | 40/0/0 |

**Abbreviation Definitions**

| Codes | Definition |
|---|---|
| LE | From Left Edge |
| RE | From Right Edge |
| FL | From Frame |
| FS | From Start Dim |

**Location Data**

| Wall/Roof | Start Dim. | Bottom Elev. | Top Elev. | End Dim. | Bottom Elev. | Top Elev. | First Pitch | Second Pitch | Ridge Distance | Ridge Height | psf |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wall: 1 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |
| Wall: 2 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |
| Wall: 3 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |
| Wall: 4 Location: 2 | Full Width | 0/0/0 | 6/2/12 | | 0/0/0 | 6/2/12 | | | | | 50.00 |

**Fastener Data**

| Wall/Roof | Type | Length | Spacing | Washers | Insul. Block | Mod. Ctrl. | Ice Damming |
|---|---|---|---|---|---|---|---|
| Wall: 1 | Not Applicable | | | | | | |
| Location: 2 | Not Applicable | | | | | | |
| Wall: 2 | Not Applicable | | | | | | |
| Location: 2 | Not Applicable | | | | | | |
| Canopy: 1 | Stainless Steel Cupped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Wall: 3 | Not Applicable | | | | | | |
| Location: 2 | Not Applicable | | | | | | |
| Wall: 4 | Not Applicable | | | | | | |
| Location: 2 | Not Applicable | | | | | | |
| Canopy: 2 | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Roof: A | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |
| Roof: B | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |

## Shape: Clerestory A

**Loads and Codes - Shape: Clerestory A**

City: Stennis Space Center County: Hancock State: Mississippi Country: United States
Building Code: 2006 International Building Code Built Up: 05AISC - ASD Rainfall: 10.00 inches per hour
Building Use: Standard Occupancy Structure Cold Form: 04AISI - ASD

**Dead and Collateral Loads**
Collateral Gravity:5.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

**Live Load**
Live Load: 20.00 psf Not Reducible

**Wind Load**
Wind Speed: 130.00 mph
Wind Exposure (Factor): B (0.741)
Parts Wind Exposure Factor: 0.741
Wind Enclosure: Enclosed
Wind Importance Factor: 1.000
Topographic Factor: 1.0000
Hurricane Prone Region
Windborne Debris Region

**Snow Load**
Ground Snow Load: 5.00 psf
Design Snow (Sloped): 2.30 psf
Snow Exposure Category (Factor): 1 Fully Exposed (0.90)
Snow Importance: 1.000
Thermal Category (Factor): Heated (1.00)
Ground / Roof Conversion: 0.70
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf

**Seismic Load**
Seismic Hazard / Use Group: Group 1
Mapped Spectral Response - Ss:11.80 %g
Mapped Spectral Response - S1:5.10 %g
Seismic Importance: 1.000
Seismic Performance / Design Category: B
Framing Seismic Period: 0.4973
Bracing Seismic Period: 0.2968
Framing R-Factor: 3.0000

Impact Resistant Covering
Base Elevation: 30/0/0
Primary Zone Strip Width: 18/2/12
Parts / Portions Zone Strip Width: 3/0/0
Basic Wind Pressure: 27.24 psf

Unobstructed, Slippery Roof

Bracing R-Factor: 3.0000
Soil Profile Type: Stiff soil (D, 4)
Diaphragm Condition: Flexible
Frame Redundancy Factor:1.0000
Brace Redundancy Factor:1.0000
Frame Seismic Factor (Cs): 0.0420 x W
Brace Seismic Factor (Cs): 0.0420 x W

**Deflection Conditions**
Frames are vertically supporting:Ceiling with Flexible Finish
Frames are laterally supporting:Unreinforced Masonry Wall
Purlins are supporting:Ceiling with Flexible Finish
Girts are supporting:Metal Wall Panels
Deflection Limit Override H/150

Per Article 2.9 in the Builder Agreement, VP Buildings assumes that the Builder has called the local Building Official or Project Engineer to obtain all code and loading information for this specific building site.

**Covering Design Loads - Roof: A**

| Zone | Units | Type | Description | Actual | Loc1 | Allow. | Ratio | Dir. | Coef. |
|---|---|---|---|---|---|---|---|---|---|
| Entire Surface | psf | L | Standard Spacing is Adequate | 21.80 | -0/11/6 | 91.000 | 0.24 | IN | 1.000 |
| Entire Surface | psf | S | Standard Spacing is Adequate | 4.10 | -0/11/6 | 91.000 | 0.05 | IN | 1.000 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 82.10 | 0/0/0 | 80.000 | 1.03 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 0/0/0 | 91.000 | 0.19 | IN | 0.580 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 98.99 | 0/0/0 | 99.000 | 1.00 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 15.42 | 0/0/0 | 91.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.69 | 0/0/0 | 57.000 | 0.82 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 0/0/0 | 91.000 | 0.19 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 58.13 | 0/0/0 | 57.000 | 1.02 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 15.42 | 0/0/0 | 91.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.69 | 179/11/6 | 57.000 | 0.82 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 179/11/6 | 91.000 | 0.19 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 58.13 | 182/0/0 | 57.000 | 1.02 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 15.42 | 182/0/0 | 91.000 | 0.17 | IN | 0.500 |
| Corner Zone | psf | W1> | Non-std Spacing: 3/3/0 Required | 82.10 | 182/0/0 | 80.000 | 1.03 | OUT | -3.080 |
| Corner Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 182/0/0 | 91.000 | 0.19 | IN | 0.580 |
| Corner Zone in Extension | psf | W1> | Non-std Spacing: 2/6/0 Required | 98.99 | 182/0/0 | 99.000 | 1.00 | OUT | -3.700 |
| Corner Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 15.42 | 182/0/0 | 91.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.69 | 0/0/0 | 57.000 | 0.82 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 0/0/0 | 91.000 | 0.19 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 58.13 | 0/0/0 | 57.000 | 1.02 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 15.42 | 0/0/0 | 91.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.69 | 179/11/6 | 57.000 | 0.82 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 179/11/6 | 91.000 | 0.19 | IN | 0.580 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.69 | 182/0/0 | 57.000 | 0.82 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 182/0/0 | 91.000 | 0.19 | IN | 0.580 |
| Side Zone in Extension | psf | W1> | Standard Spacing is Adequate | 58.13 | 182/0/0 | 57.000 | 1.02 | OUT | -2.200 |
| Side Zone in Extension | psf | <W2 | Standard Spacing is Adequate | 15.42 | 182/0/0 | 91.000 | 0.17 | IN | 0.500 |
| Side Zone | psf | W1> | Standard Spacing is Adequate | 46.69 | 11/0/10 | 57.000 | 0.82 | OUT | -1.780 |
| Side Zone | psf | <W2 | Standard Spacing is Adequate | 17.60 | 11/0/10 | 91.000 | 0.19 | IN | 0.580 |
| Interior Area | psf | W1> | Standard Spacing is Adequate | 38.52 | 2/0/10 | 57.000 | 0.68 | OUT | -1.480 |
| Interior Area | psf | <W2 | Standard Spacing is Adequate | 17.60 | 2/0/10 | 91.000 | 0.19 | IN | 0.580 |

**Panel Data**

| Wall/Roof | Type | Thickness | Finish | Color | Direction | Gable Dir | Max. Length |
|---|---|---|---|---|---|---|---|
| Wall: 1 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Wall: 2 | NBVP - Panel | 1/16" | psf = 1.00 | Supported by others=no | | | |
| Wall: 3 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Wall: 4 | NBVP - Panel | 1" | psf = 1.25 | Supported by others=no | | | |
| Location: 2 | NBVP - Panel | 1/16" | | Supported by others=no | | | |





| Roof: A | SLR2 | 22 | Galvalume | Standard Color | System Generated | Not Applicable | 40/0/0 |
|---|---|---|---|---|---|---|---|

**Abbreviation Definitions**

| Codes | Definition |
|---|---|
| LE | From Left Edge |
| RE | From Right Edge |
| FL | From Frame |
| FS | From Start Dim |

**Location Data**

| Wall/Roof | Start Dim. | Bottom Elev. | Top Elev. | End Dim. | Bottom Elev. | Top Elev. | First Pitch | Second Pitch | Ridge Distance | Ridge Height | psf |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wall: 4 Location: 2 | 5/6/0 LE | 2/2/0 | 6/2/4 | 5/6/0 RE | 2/2/0 | 6/2/4 | | | | | 1.00 |

**Fastener Data**

| Wall/Roof | Type | Length | Spacing | Washers | Insul. Block | Mod. Ctrl. | Ice Damming |
|---|---|---|---|---|---|---|---|
| Wall: 1 | Not Applicable | | | | | | |
| Wall: 2 | Not Applicable | | | | | | |
| Wall: 3 | Not Applicable | | | | | | |
| Wall: 4 | Not Applicable | | | | | | |
| Location: 2 | Not Applicable | | | | | | |
| Roof: A | Stainless Steel Capped | Standard Option | UL90 Uplift | Yes | Thermal Block | No | No |

LIGHT PANELS ARE TO BE SOME UNKNOWN TYPE OF INSULATED (SANDWICH) PANEL.