

STRUCTURAL NOTES

A. GENERAL

1. THE STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION.
2. THE DESIGN GRANTY LOADS ARE AS FOLLOWS:

SUPERIMPOSED DEAD LOADS	5 PSF
MECHANICAL AND CEILING	20 PSF
FINISHES	AS REQUIRED
SPRINKLER SYSTEMS	AS REQUIRED
LIVE LOADS	20 PSF
ROOF GRADE SPACE	50 PSF
FOUNDATION COEFFICIENTS	1.0

3. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE WIND PRESSURES SPECIFIED IN SECTION 2311 OF THE URBAN BUILDING CODE, USING A BASIC WIND SPEED OF 90 MILES PER HOUR AT A STANDARD HEIGHT OF 30 FEET ABOVE THE GROUND.
4. METHODS, PROCEDURES AND SEQUENCES OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE STABILITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
5. THE GENERAL CONTRACTOR AND SUB-CONTRACTORS SHALL DETERMINE THE SCOPE OF THE STRUCTURAL WORK FROM THE CONTRACT DOCUMENTS TAKEN AS A WHOLE. THE STRUCTURAL DRAWINGS SHALL NOT BE CONSIDERED SEPARATELY FOR PURPOSES OF BRINGING THE STRUCTURAL WORK INTO CONFORMANCE WITH THE CITY OF HOUSTON BUILDING CODE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR INCLUDING NECESSARY COMBINATIONS DESCRIBED OR IMPLIED BY THE ARCHITECTURAL AND MECHANICAL DRAWINGS.
6. SCALES NOTED ON THE DRAWINGS ARE FOR GENERAL INFORMATION ONLY. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED BY DIRECT SCALING OF THE DRAWINGS.
7. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL RESULTING REVISIONS TO THE STRUCTURAL SYSTEM AS A RESULT OF ACCEPTANCE OF CONTRACTOR PROPOSALS, ALTERATIONS OR SUBSTITUTIONS.
8. PRINCIPAL OPENINGS IN THE STRUCTURE ARE INDICATED ON THE CONTRACT DRAWINGS. ALL OTHER OPENINGS SHALL BE INDICATED BY DIMENSIONS AND INDICATED OPENINGS IN SLABS WITH A MAXIMUM SIZE DIMENSION OR DIAMETER OF 12 INCHES OR LESS SHALL NOT BE LOCATED IN STREETS OR DRIVEWAYS. ALL OTHER OPENINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW.

B. FOUNDATION AND SLAB ON GRADE

1. THE SUBSURFACE INFORMATION AND FOUNDATION DESIGN ARE BASED ON A REPORT PREPARED BY GEORGETE E. THOMAS & ASSOCIATES, REPORT NUMBER 96-103, DATED JANUARY 1996. ALL FOUNDATION DESIGN SHALL BE IN ACCORDANCE WITH THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION, AND THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS.
2. THE FOUNDATION FOR THE STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING:
 - DEAD LOAD 4400 PSF
 - LIVE LOAD 6750 PSF
 - TOTAL LOAD 11150 PSF
3. GRADED PERS SHALL BE EXCAVATED, CLEANED, REINFORCED AND CONCRETE PLACED ON THE SAME DAY. GRADED PERS WITH LESS THAN 2" OF CLEARANCE SHALL BE EXCAVATED TO A MINIMUM OF 22 INCHES DEEP. BELLS CAN NOT BE FORMED WITHOUT CURING OF THE SOIL. THE ARCHITECT, STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER SHALL BE NOTIFIED BEFORE FURTHER CONSTRUCTION IS INITIATED.
4. FOUNDATION CONDITIONS NOTED DURING CONSTRUCTION, WHICH DIFFER FROM THOSE DESCRIBED IN THE GEOTECHNICAL REPORT SHALL BE REFERRED TO THE ARCHITECT, STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER BEFORE FURTHER CONSTRUCTION IS INITIATED.
5. SUPERIOR UNDER SLABS FULL SHALL HAVE A PLASTERED JOINT OF REINFORCED CONCRETE. THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION, SHALL BE FOLLOWED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT.
6. THE FLOOR SUPERIOR SHALL BE PROPERLY COMPACTED, PROPERLY CURED, PROTECTED FROM FREEZING WATER, AND PROTECTED FROM PLACEMENT OF CONCRETE. A VAPOR BARRIER SHALL BE PLACED ON TOP OF THE SUPERIOR FILL MATERIAL.
7. SLABS ON GRADE SHALL HAVE CONSTRUCTION JOINTS OR CHECK CONTROL JOINTS AT EACH COLUMN LINE IN EACH DIRECTION. JOINTS SHALL BE REINFORCED BY CONSTRUCTION AND/OR CHECK CONTROL JOINTS CONTAINS MORE THAN 40 SQUARE FEET OF SLAB AREA. PROVIDE NO. 4 X 4'-0" TOWELS AT 24 INCHES ON CENTER. PROVIDE NO. 4 X 4'-0" TOWELS AT 24 INCHES ON CENTER WITH REINFORCING BARS OR WELDED WIRE FABRIC SUPPLIED IN FLAT SHEETS. PROVIDE STANDARD CORROSION RESISTANT HIGH-CHANGERS WITH SPAN BEARING PLATES TO MAINTAIN THE REINFORCEMENT AT OR ABOVE THE MIN-DEPTH OF THE SLAB.

C. MEZZANINE FLOOR DECK

1. FLOOR DECK SHALL BE CAST-IN-PLACE CONCRETE 3 INCHES THICK. ON EXISTING CONCRETE. METAL FORMS SHALL BE USED TO FORM THE CONCRETE. METAL FORMS SHALL BE 28 GAUGE COATED STEEL CONFORMING TO ASTM A81, GRADE E. METAL FORMS SHALL BE 5/16 INCHES DEEP AND SHALL HAVE A MINIMUM SECTION MODULUS OF 0.03 INCHES⁴ PER FOOT OF WIDTH. REINFORCING SLAB WITH 8"X14" X 4" WELDED WIRE FABRIC.
2. REINFORCEMENT AND ALUMINUM CROSSES OF STEEL FLOOR DECK SHALL BE DESIGNED ON THE BASIS OF THE SPECIFICATION FOR THE DESIGN OF COOL-FORMED STEEL STRUCTURAL MEMBERS.
3. PLAC WELD DECK TO SUPPORTING STEEL AND ADDING DECK SHEETS USING STANDARD D1.3. DECK SHALL BE WELDED TO DECK ANGLES AT ENDS AND ALONG PERIMETER. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) D1.3. WELDING IS NOT SPECIFIED BY THE DECK MANUFACTURER UNLESS NOTED OTHERWISE. WELDING IS NOT SPECIFIED BY THE DECK MANUFACTURER UNLESS NOTED OTHERWISE. WELD DECK AT 1/2 INCHES ON CENTER AT SUPPORTS AND ALONG DECK PERIMETER.
4. IN ADDITION TO THE SPECIFICATIONS NOTED ELSEWHERE, THE DECK CONCRETE SHALL CONFORM TO THE FOLLOWING:
 - ANNUAL CLIMATE CONTROL 5-1/2" STAYS/FT
 - MINIMUM SLUMP PRIOR TO PLACING 4 INCHES
 - MAXIMUM AGGREGATE SIZE 1 INCH
5. METAL FORMS SHALL BE FREE FROM OIL, GREASE AND ANY OTHER DEBRIS. MATERIALS THAT WOULD TEND TO REDUCE THE BOND BETWEEN THE CONCRETE AND THE FORM.
6. PROVIDE SCHEDULED CHAIRS, BOLSTER BARS, ETC. TO MAINTAIN WELDED WIRE FABRIC AT DEPTH SPECIFIED.
7. REMOVE 7 DAY CURING OF DECK IMMEDIATELY AFTER FINISHING USING ONE OF THE FOLLOWING METHODS:
 - A. CONTINUOUSLY WATERED BURLAP
 - B. WATERPROOF MEMBRANES
 - C. SPRAVED-ON LIQUID MEMBRANE

8. REFER TO THE SPECIFICATIONS FOR REINFORCEMENT. PROTECT THE CONCRETE SURFACE BETWEEN FINISHING OPERATIONS ON HOT, DRY DAYS OR ANY TIME PLASTIC SHEETING CHECKS COULD BE DAMAGED BY WIND OR OTHER FACTORS. REMOVE PLASTIC SHEETING IMMEDIATELY AFTER FINISHING OPERATIONS ON ALL DAYS FROM WIND, HAIL, OR OTHER UNDESIRABLE EFFECTS.
- D. ROOF DECK
1. ROOF DECK SHALL BE CAST-IN-PLACE CONCRETE 3 INCHES THICK. ON EXISTING CONCRETE. METAL FORMS SHALL BE USED TO FORM THE CONCRETE. METAL FORMS SHALL BE 28 GAUGE COATED STEEL CONFORMING TO ASTM A81, GRADE E. METAL FORMS SHALL BE 5/16 INCHES DEEP AND SHALL HAVE A MINIMUM SECTION MODULUS OF 0.03 INCHES⁴ PER FOOT OF WIDTH. REINFORCING SLAB WITH 8"X14" X 4" WELDED WIRE FABRIC.
 2. REINFORCEMENT AND ALUMINUM CROSSES OF STEEL ROOF DECK SHALL BE DESIGNED ON THE BASIS OF THE SPECIFICATION FOR THE DESIGN OF COOL-FORMED STEEL STRUCTURAL MEMBERS.
 3. PLAC WELD DECK TO SUPPORTING STEEL AND ADDING DECK SHEETS IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY STANDARD D1.3. DECK SHALL BE WELDED TO DECK ANGLES AT ENDS AND ALONG PERIMETER. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) D1.3. WELDING IS NOT SPECIFIED BY THE DECK MANUFACTURER UNLESS NOTED OTHERWISE. WELD DECK AT 1/2 INCHES ON CENTER AT SUPPORTS AND ALONG DECK PERIMETER.
- E. CONCRETE
1. CONCRETE IN THE FOLLOWING AREAS SHALL HAVE MINIMUM 5000 PSI COMPRESSIVE STRENGTH CONFORMING TO ASTM C150 AND SHALL HAVE THE FOLLOWING PORTLAND CEMENT CONCENTRATION TO ASTM C150 AND SHALL HAVE THE FOLLOWING GRAVEL FILLING:
 - GRAVEL FILLING 3000 PSF
 - GRADE REINFORCEMENT 3000 PSF
 - SLABS AND PARTS 3000 PSF
 - TELL AND PARTS 3000 PSF
 2. ROOF FLOOR DECK RATES SHALL BE NON-REINFORCED, NON-METALLIC CORROSION RESISTANT. REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION, AND THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS.
 3. REINFORCEMENT OF CONCRETE REINFORCEMENT BARS AND ACCESSORIES SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 308, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT BARS AND ACCESSORIES," AND ACI 309, "CONCRETE REINFORCEMENT BARS AND ACCESSORIES FOR REINFORCED CONCRETE STRUCTURES," AND CITY MANUAL OF STANDARD PRACTICES.
 4. WIND, TRANSPORTING, AND PLACING OF CONCRETE SHALL CONFORM TO ACI 308.
 5. MINIMUM CONCRETE COVER PROTECTION FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS (SEE ACI 308 SECTION 7.7 FOR CONDITIONS NOT NOTED):

REINFORCEMENT BARS	3 INCHES
TOP OF SLABS	1-1/2 INCHES
BOARD FORMED SLABS	2 INCHES
BOTTOM FORMED SLABS	3 INCHES
SLABS ON GRADE	2 INCHES (TOP)
PLASTERED FINISHES	3/4 INCHES (TOP)
WALLS BELOW GRADE (BACKFILLED SOIL)	2 INCHES
WALLS BELOW GRADE (NO BACKFILL)	3/4 INCHES

 PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED.
 6. CONCRETE REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60. NO. 3 BARS MAY CONFORM TO ASTM A615, GRADE 40, UNLESS NOTED OTHERWISE. REINFORCEMENT BARS SHALL NOT BE HOT ROLLED OR WELDED. REINFORCEMENT BARS SHALL BE PROVIDED WITH THE CORNER BENDS AS NOTED ON THE CONTRACT DRAWINGS.
 7. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A653, FABRIC SHALL BE SUPPLIED IN FLAT SHEETS. FABRIC SHALL BE LAPPED TWO WELLS AT SPACES.
 8. REINFORCEMENT RESISTANCE TO CORROSION SHALL BE IN ACCORDANCE WITH THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION, AND THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS.
 9. PROVIDE 2" NO. 4 REINFORCEMENT BARS X 4'-0" AT RE-ENTRANCE CORNERS OF CONCRETE WALLS. PROVIDE 2" NO. 4 REINFORCEMENT BARS X 4'-0" AT RE-ENTRANCE CORNERS OF THE SLAB AND DIAGONAL TO THE CORNER WITH 1" CLEARANCE FROM THE SLAB AT THE CORNER.
- F. STRUCTURAL STEEL
1. STRUCTURAL STEEL ROLLED SHAPES AND PLATES SHALL CONFORM TO ASTM A36.
 2. STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S GRADE B. PROVIDE 10% OVERSIZE FOR THE STEEL PIPE. SHALL BE SUPPLIED TO THE CONTRACTOR.
 3. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500, GRADE B.
 4. ANCHOR BOLTS SHALL CONFORM TO ASTM A307, UNLESS NOTED OTHERWISE.
 5. CONNECTION BOLTS FOR STRUCTURAL STEEL MEMBERS SHALL BE HIGH STRENGTH BOLTS WHICH MEET OR EXCEED THE REQUIREMENTS OF ASTM A325, TYPE N, X OR F. BOLTS SHALL BE DESIGNED AS BEARING TYPE BOLTS, EXCEPT AS NOTED. BOLTS SHALL BE THE SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS. BOLTS SHALL HAVE A HARDENED WASHER PLACED UNDER THE ELEMENT TO BE JOINED. BOLTS IN BRACKING CONNECTIONS, MOMENT RESISTING CONNECTIONS, AND MOMENT RESISTING CONNECTIONS SHALL BE CONSIDERED TO BE "SLIP CRITICAL" BOLTS, AND SHALL BE DESIGNED AS SLIP CRITICAL BOLTS. REACTION TYPE CONNECTIONS SHALL BE NOTIFIED BY THE ARCHITECT, STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER. REACTION TYPE BOLTS, REACTION TYPE CONNECTIONS SHALL BE NOTIFIED BY THE ARCHITECT, STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER. REACTION TYPE BOLTS, REACTION TYPE CONNECTIONS SHALL BE NOTIFIED BY THE ARCHITECT, STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER.
 6. TYPICAL CONNECTION DETAILS ARE INDICATED ON THE DRAWINGS. THE FABRICATOR SHALL PREPARE THE SHOP DRAWINGS FOR THE PROJECT BASED ON THE REVISIONS TO THE DRAWINGS. THE FABRICATOR SHALL PREPARE THE CONNECTION DETAILS FOR THE PROJECT BASED ON THE REVISIONS TO THE DRAWINGS. THE FABRICATOR SHALL PREPARE THE CONNECTION DETAILS FOR THE PROJECT BASED ON THE REVISIONS TO THE DRAWINGS. THE FABRICATOR SHALL PREPARE THE CONNECTION DETAILS FOR THE PROJECT BASED ON THE REVISIONS TO THE DRAWINGS.

7. OPEN WEB STEEL JOISTS AND BRACING FOR JOISTS SHALL CONFORM TO THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION, AND THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS FOR OPEN WEB STEEL JOISTS. TOP CHORDS SHALL BE ANGLES OR TEES. JOISTS SHALL BE WELDED TO THE SUPPORTING STEEL MEMBERS USING THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY (AWS) D1.3. WELDING IS NOT SPECIFIED BY THE DECK MANUFACTURER UNLESS NOTED OTHERWISE. WELD DECK AT 1/2 INCHES ON CENTER AT SUPPORTS AND ALONG DECK PERIMETER.
 8. JOIST BRACING SHALL CONFORM TO THE CITY OF HOUSTON BUILDING CODE, 1988 EDITION, AND THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS FOR JOIST BRACING. JOIST BRACING SHALL BE WELDED TO THE JOIST CHORDS USING THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY (AWS) D1.3. WELDING IS NOT SPECIFIED BY THE DECK MANUFACTURER UNLESS NOTED OTHERWISE. WELD DECK AT 1/2 INCHES ON CENTER AT SUPPORTS AND ALONG DECK PERIMETER.
- ERECTOR AND WELDER IN FINAL POSITION. CARRIER ALL JOIST BRACING THE AMOUNT RECOMMENDED BY THE SA OR AS INDICATED IN THE DRAWINGS.
9. AS REQUIRED BY THE BUILDING OFFICIAL, THE OPEN WEB STEEL JOIST MANUFACTURER SHALL BE REQUIRED TO PROVIDE PROOF OF TESTING AND INSPECTION OF THE OPEN WEB JOISTS SHALL BE PERFORMED BY AN APPROVED AGENCY.
 10. WELDING SHALL CONFORM TO THE AMERICAN WELDING SOCIETY STANDARD D1.1, CLASS E70XX LOW HYDROGEN.
 11. SPACING OF STRUCTURAL STEEL MEMBERS SHALL NOT BE LESS THAN THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY (AWS) D1.1, CLASS E70XX LOW HYDROGEN.
 12. THE CONTRACTOR SHALL NOTIFY HANES WHALEY ASSOCIATES, INC. OF ANY MISAPPROPRIATE STRUCTURAL STEEL PRIOR TO ERECTION OF SAME.
 13. PENETRATIONS SHALL NOT BE CUT IN STRUCTURAL STEEL MEMBERS UNLESS SO INDICATED IN THE DRAWINGS OR AS REQUIRED BY THE ENGINEER.
 14. HEAVY CONCRETE ANCHORS SHALL BE NESTED OR FISH HEADED CONCRETE ANCHORS (OR ACCEPTABLE EQUAL), AND SHALL CONFORM TO ASTM A307, GRADES C-100 THROUGH C-120. ANCHORS SHALL BE AUTOMATICALLY GUN WELDED WITH E70XX LOW HYDROGEN WELDING METAL. WELDING SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY (AWS) D1.1, CLASS E70XX LOW HYDROGEN.
 15. PERFORM BAR ANCHORS (B.A.) SHALL BE NESTED OR FISH HEADED BAR ANCHORS (OR ACCEPTABLE EQUAL), AND SHALL BE MADE FROM COLD DRAWN WIRE PER ASTM A307 CONFORMING TO ASTM A307 WITH A MINIMUM FIELD STRENGTH OF 60,000 PSI. ANCHORS SHALL BE WELDED TO THE JOIST CHORDS USING THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY (AWS) D1.1, CLASS E70XX LOW HYDROGEN.
 16. BEAMS SHALL BE CARRIED UPWARD WHERE SHOWN ON THE CONTRACT DOCUMENTS. BEAMS NOT CARRIED UPWARD WHERE SHOWN, ANY WILL CARRIED SHALL BE DETAILED UPWARD IN THE BEAMS.

EMBEDDED PLATES AND ANGLES

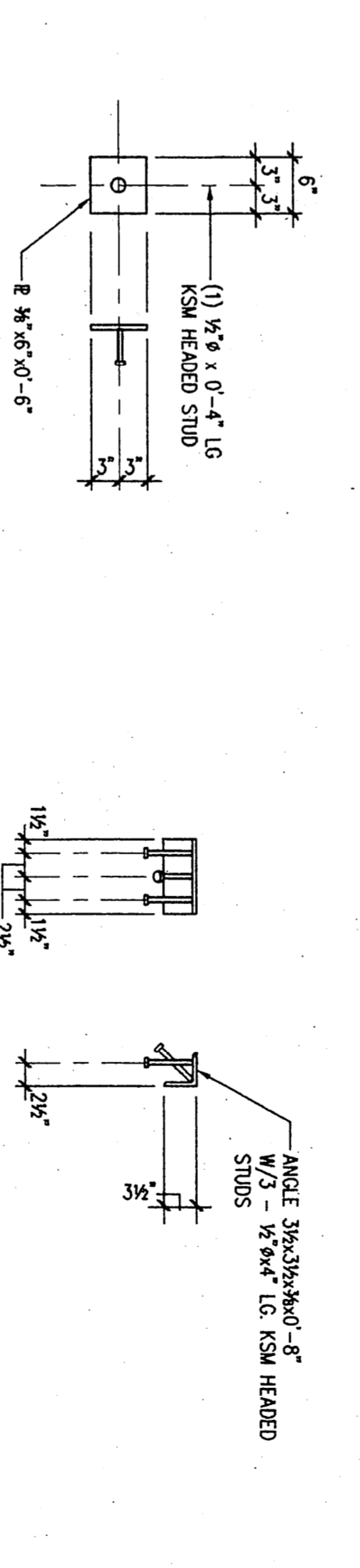


PLATE A

ANGLE C

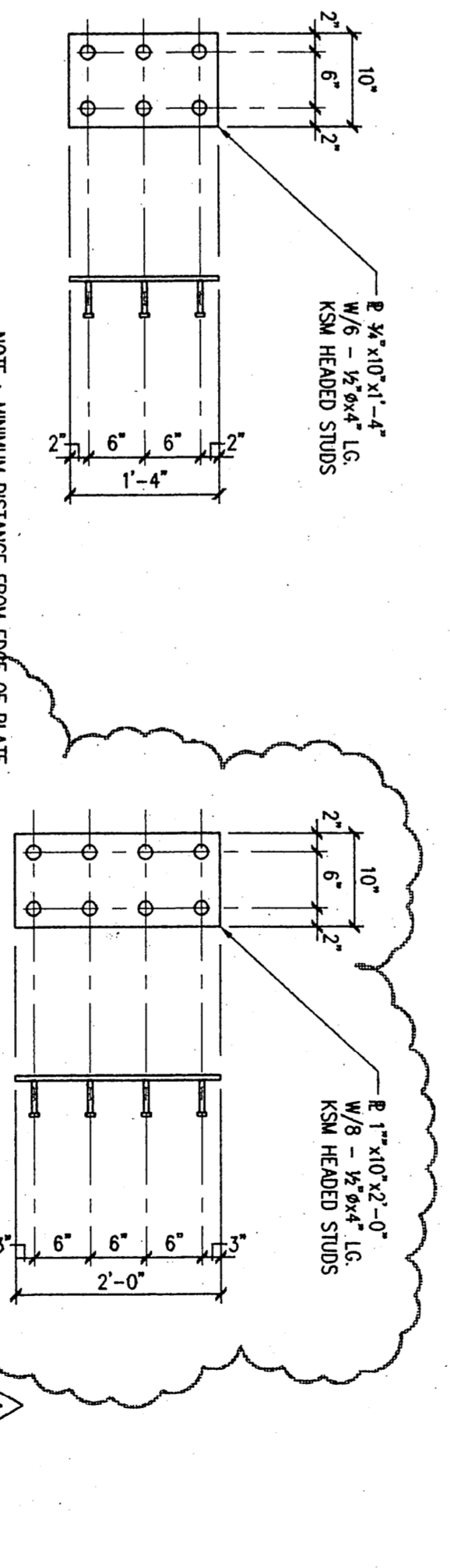


PLATE E

ANGLE J

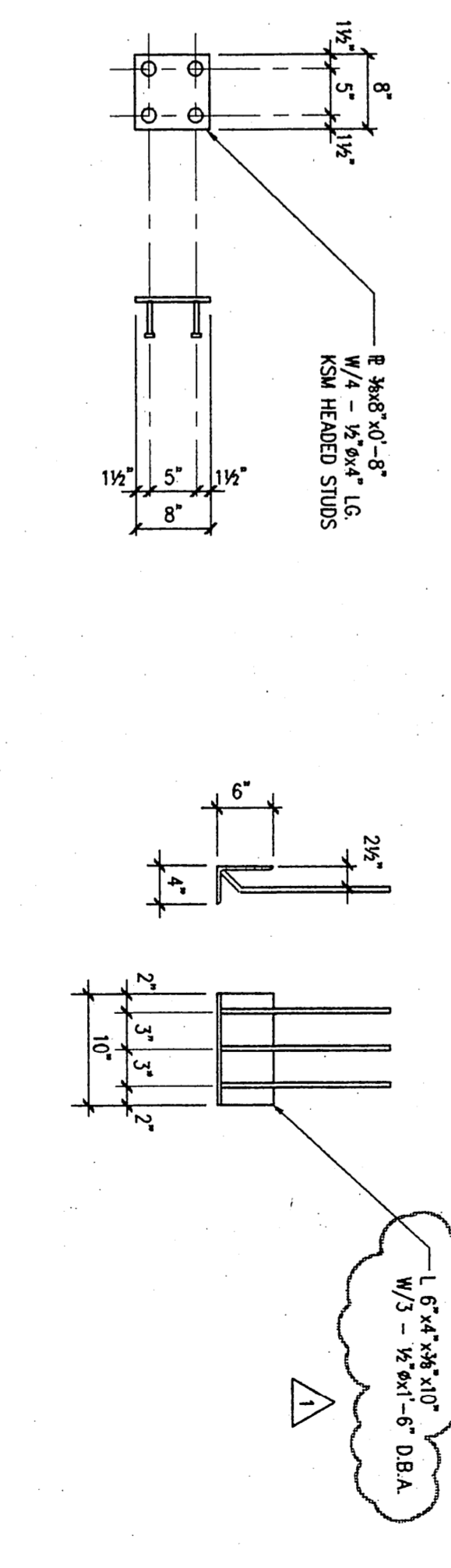
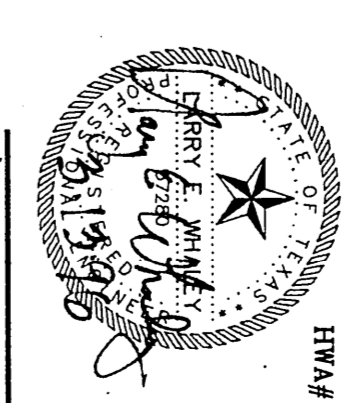
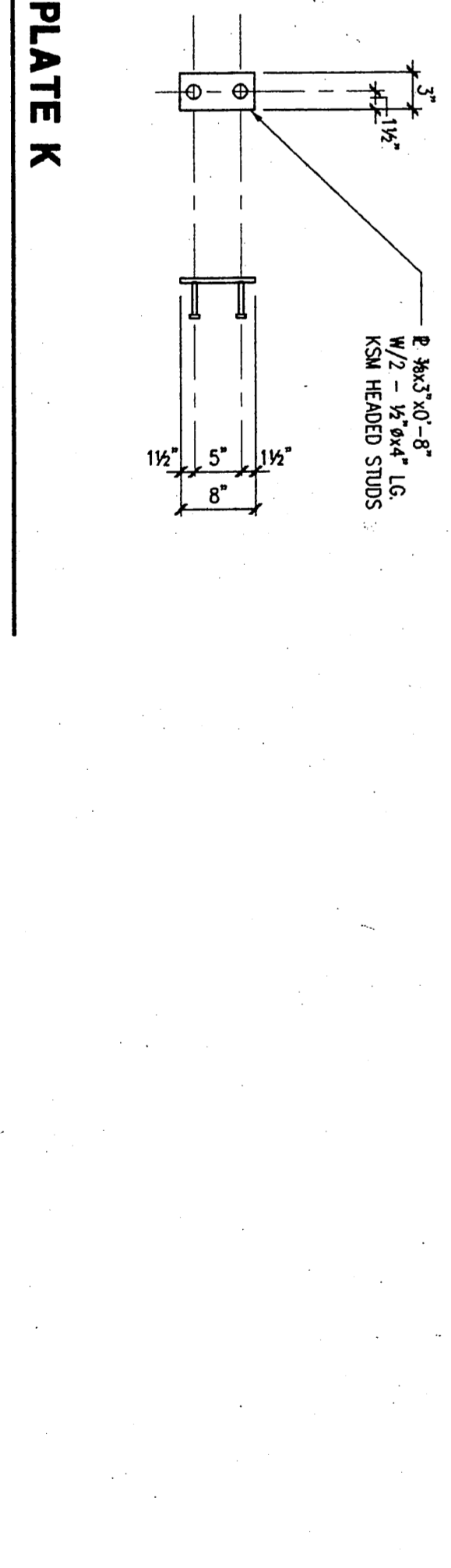


PLATE H

ANGLE J

PLATE K



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