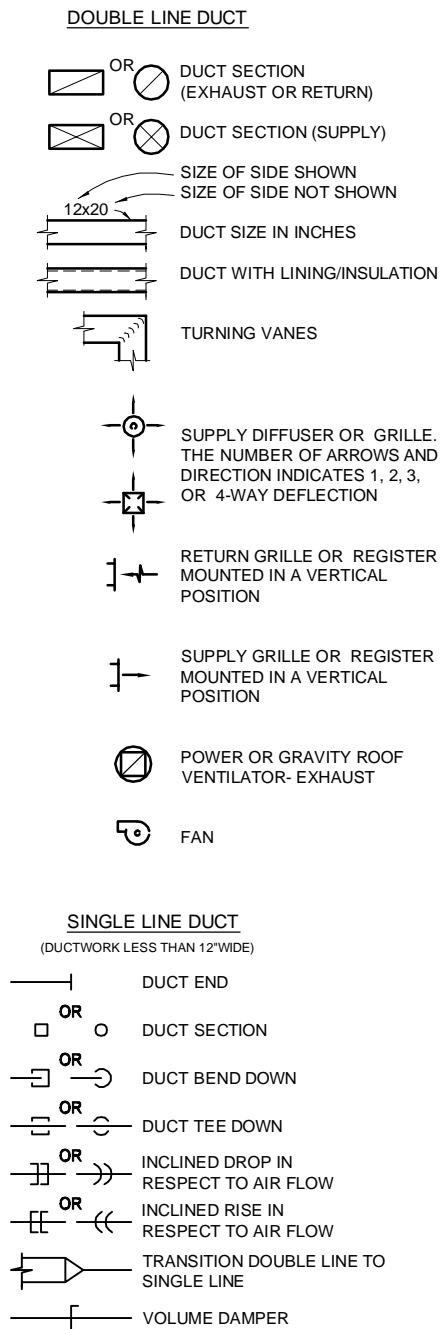


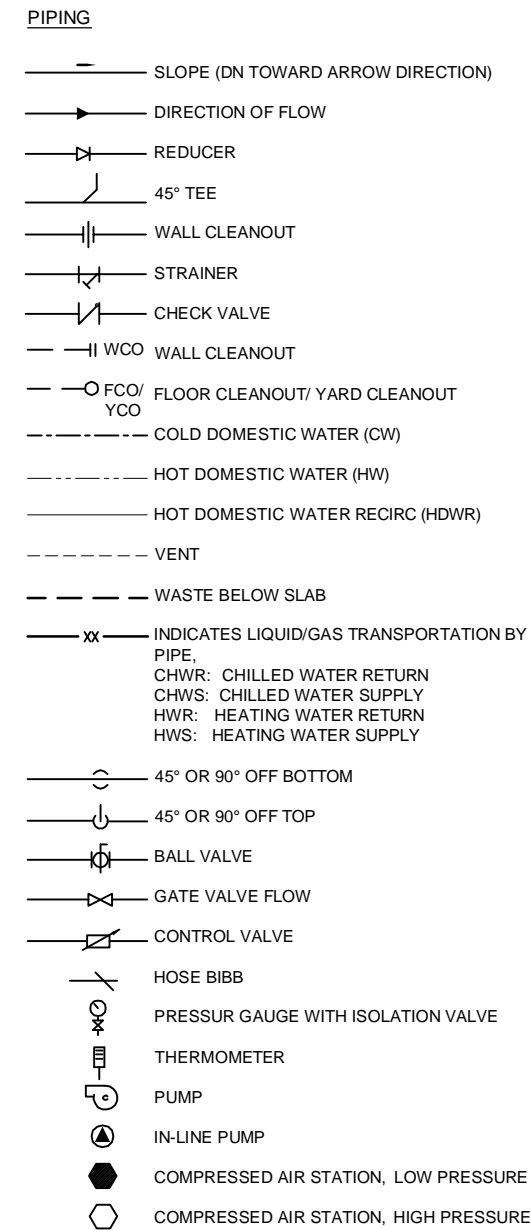
## MECHANICAL/PIPING ABBREVIATIONS

A		O	
AAV	AUTOMATIC AIR VENT	OA	OUTSIDE AIR
AC	AIR COMPRESSOR	ORD	OVERFLOW ROOF DRAIN
AD	AIR DRYER, AUTOMATIC DRAIN	P	
AFF	ABOVE FINISHED FLOOR	P	PUMP
ATF	AUTOMATIC TRANSMISSION FLUID	Q	
B		R	
B	BOILER	RA	RETURN AIR
BFF	BELOW FINISHED FLOOR	RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR
BTUH	BRITISH THERMAL UNITS PER HOUR	RD	ROOF DRAIN
BW	BOOT WASH	RF	RETURN FAN
C		RG	RETURN GRILLE
CA	COMPRESSED AIR, LOW PRESSURE, 100PSIG	S	
CW	COLD DOMESTIC WATER	S	SINK
CFM	CUBIC FEET PER MINUTE	SA	SUPPLY AIR
CO	CLEANOUT	SCF	SOURCE CAPTURE FAN
D		SD	SUPPLY DIFFUSER
E		SF	SUPPLY FAN
E	EXHAUST	SHR	SHOWER
EA	EXHAUST AIR	SL	SLOPE
EB	ELECTRIC BASEBOARD	SR	SUPPLY REGISTER
EC	ELECTRIC CEILING PANEL	SS	STAINLESS STEEL
EF	EXHAUST FAN	T	
EO1	ENGINE OIL, 15W40	T	TANK
EO2	ENGINE OIL, 5W20	TD	TRENCH DRAIN
EVP	EVAPORATOR	TYP	TYPICAL
EWC	ELECTRIC WATER COOLER	U	
EXH	EXHAUST	UH	UNIT HEATER
EXST	EXISTING	UR	URINAL
EW	EYEWASH	V	
F		V	VENT
FCO	FLOOR CLEANOUT	VFD	VARIABLE FREQUENCY DRIVE
FD	FLOOR DRAIN	VL	VEHICLE LIFT
FTU	FAN TERMINAL UNIT	VTR	VENT THRU ROOF
FRL	FILTER, REGULATOR, LUBRICATOR	W	
G		W	WASTE
GPM	GALLONS PER MINUTE	WC	WATER CLOSET, WATER COLUMN
GR	GREASE	WH	WATER HEATER
H		WM	WASH MACHINE
H	HEADER	X	
HB	HOSE BIBB	Y	
HC	HEATING COIL	Y	YARD CLEANOUT
HW	HOT DOMESTIC WATER	Z	
HF	HYDRAULIC FLUID		
HP	HIGH PRESSURE COMPRESSED AIR, 150PSIG		
HWR	HEATING WATER RETURN		
HWS	HEATING WATER SUPPLY		
HV	HEATING AND VENTILATION UNIT		
HX	HEAT EXCHANGER		
I			
IA	INTAKE AIR		
IW	INDUSTRIAL WATER (NON-POTABLE)		
K			
L			
L	LAVATORY		
M			
MAX	MAXIMUM		
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR		
MIN	MINIMUM		
MS	MIXING STATION		
MSB	MOP SERVICE BASIN		
MU	MAKE UP		
N			

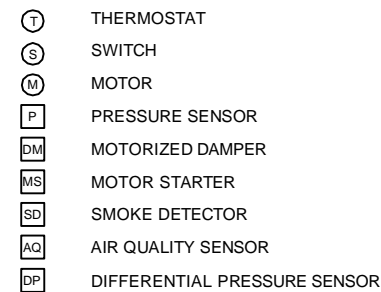
## DUCTWORK SYMBOLS



## PIPING SYMBOLS



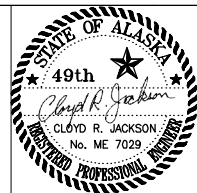
## CONTROL SYMBOLS



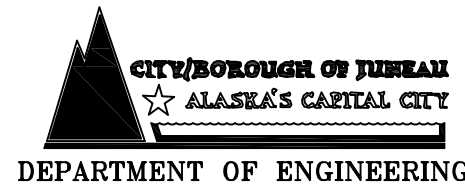
## MECHANICAL/PIPING GENERAL NOTES

- THESE NOTES APPLY TO ALL M, FP & P DRAWINGS UNLESS NOTED OTHERWISE
- SEE SPECIFICATION DIVISION 15 FOR INSTALLATION AND OTHER REQUIREMENTS FOR MECHANICAL WORK SHOWN ON "M", "FP" AND "P" SERIES DRAWINGS.
- THE DESIGN SHOWN ON THE DRAWINGS IS BASED ON THE EQUIPMENT MANUFACTURERS LISTED IN THE MECHANICAL EQUIPMENT SCHEDULES. EQUIPMENT PROPOSED BY THE CONTRACTOR THAT IS NOT LISTED IN THE SCHEDULES SHALL BE SUBMITTED TO CITY/BOROUGH OF JUNEAU AS A REQUEST FOR SUBSTITUTION IN ACCORDANCE WITH DIVISION 1.
  - PROVIDE ALL MECHANICAL SYSTEMS IN ACCORDANCE WITH THE FIRE WALL, FIRE BLOCKING AND FIRE STOP PROVISIONS SHOWN ON THE ARCHITECTURAL DRAWINGS.
  - COORDINATE SUPPLY AIR DIFFUSERS AND RETURN/EXHAUST AIR GRILLE LOCATIONS WITH ARCHITECTURAL DRAWINGS. COORDINATE DUCT ROUTING WITH LIGHT FIXTURE LOCATIONS.
  - MECHANICAL WORK SHOWN IS DIAGRAMMATIC. PROVIDE OFFSETS, TRANSITIONS, AND OTHER DUCTWORK, PIPING AND ASSOCIATED CONSTRUCTION WHERE REQUIRED TO AVOID BUILDING STRUCTURAL ELEMENTS OR THE WORK OF OTHER TRADES.
  - DUCTWORK DIMENSIONS SHOWN ARE NET INSIDE DIMENSIONS. ENLARGE DUCT DIMENSIONS AS REQUIRED FOR INTERNALLY LINED DUCTWORK, SEE SPECIFICATIONS.
  - PAINT EXTERIOR PIPING, DUCTWORK, FANS, CURBS AND SHEET METAL WITH URETHANE FINISH, COLOR AS SELECTED BY ARCHITECT. PAINT UNFINISHED STEEL, GALVANIZED, ALUMINUM OR SST EXTERIOR SURFACES, MATERIALS OR EQUIPMENT, PROVIDED UNDER DIVISION 15, COLOR AS SELECTED BY ARCHITECT.
  - TEMPERATURE SENSORS SHALL BE LOCATED WHERE SHOWN 48 INCHES ABOVE FINISHED FLOOR.
  - PROVIDE BIRDSCREENS FOR ALL LOUVERS AND ALL OUTSIDE AIR INTAKES.
  - PENETRATE ROOF DECKS AS REQUIRED TO INSTALL MECHANICAL WORK. PROVIDE BLOCKING AROUND PENETRATIONS AND AS NOTED ON STRUCTURAL DRAWINGS. SEAL ALL PENETRATIONS AIR AND WATER TIGHT.
  - PROVIDE ACCESS PANELS FOR ALL MECHANICAL EQUIPMENT OR VALVES ENCLOSED IN PERMANENT CONSTRUCTION OR DUCTWORK.
  - INSTALL DUCTWORK TO MAINTAIN SERVICE CLEARANCES, ACCESS DOOR CLEARANCES AND COIL PULL CLEARANCES AT ALL HVAC EQUIPMENT.
  - COORDINATE FLOOR AND WALL CLEANOUT LOCATIONS WITH OFFICE CASEWORK VENDOR DRAWINGS AND OTHER FURNISHINGS, RELOCATE AS REQUIRED.
  - PROVIDE FINAL LOCATIONS FOR ROUGH-IN AND FINISH OF WASTE, VENT, AND WATER SUPPLY. CONNECTIONS AND LOCATIONS PER CASEWORK VENDOR DRAWINGS.
  - PROVIDE ALL FLOOR DRAINS, FLOOR SINKS, INDIRECT WASTE CONNECTIONS, AND OPEN HUB DRAINS WITH VENTS AND TRAP PRIMERS, EXCLUDING THE MAINTENANCE AREAS AND FUEL BAY.
  - SURVEY AND FIELD VERIFY ALL INVERT ELEVATIONS SHOWN ON PLUMBING DRAWINGS. INVERT ELEVATIONS SHOWN ARE APPROXIMATE, PROVIDE BUILDING WASTE PLUMBING TO PROPERLY INTERCONNECT WITH SITE WASTE PLUMBING. SEE CIVIL DRAWINGS.
  - T-PULL BRANCH PIPING NOT ALLOWED. ALL CHANGES IN DIRECTION SHALL BE MADE WITH FITTINGS.
  - ALL PENETRATIONS AND SLEEVES THRU FLOORS/ WALLS SHALL BE SEALED WEATHERTIGHT.
  - ALL CONDENSATE DRAINS SHALL BE ROUTED FULLSIZE TO NEAREST WASTE LINE OR APPROVED EXTERIOR LOCATION.
  - ALL UNDER BUILDING PIPING SHALL BE SLOPED AT 2%, FOR YARD PIPING SLOPES SEE CIVIL DRAWINGS.
  - EXTEND VTR PIPING AS REQUIRED TO MAINTAIN 10' MINIMUM CLEARANCE TO OUTSIDE AIR INTAKE LOUVERS.

ONE INCH AT FULL SIZE  
1"  
IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

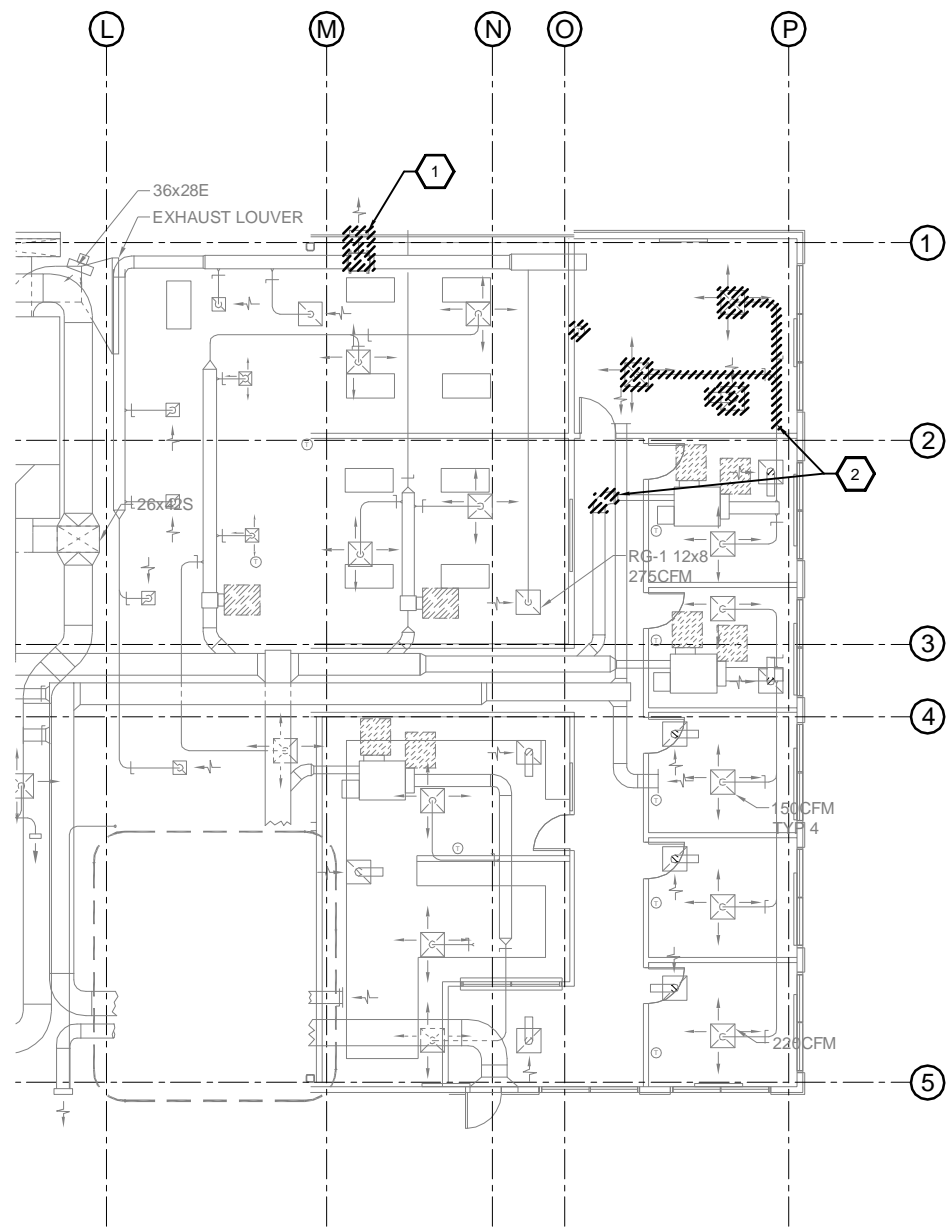


CONSOLIDATED PUBLIC WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

MECHANICAL ABBREVIATIONS & SYMBOLS

SHEET NO.  
M0.01  
TOTAL SHEETS  
31 - 72

Path: S:\Active\3010019 - CBU PW Facility\Mechanical\CBU CO M1.01-DEM.Dwg Plot date: May 21, 2010-03:57:43pm CAD User: vince.vila.  
 Xref Filename: | C:\P\W-Ord-125 Scale | C:\P\W-Building\Working | M1.03 - Mech Lower Level Plan | M1.04 - Mech Upper Level Plan | M1.05R - Add Alt. Emerged Mechanical Floor Plan | CPMF\_TB BE | ser-1111 |



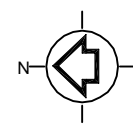
**NOTES:**

1. DRAWINGS SHOW GENERAL INTENT OF THE DEMOLITION WORK. DEMOLITION OF EQUIPMENT AND COMPONENTS SHALL INCLUDE ALL SUPPORTS, PADS, HANGERS, INSULATION, CONTRLS, STARTERS, ACCESSORIES AND APPURTENANCES NOT REQUIRED FOR THE INSTALLATION OF THE NEW SYSTEM.
2. SEE DWG M1.02 FOR LOCATION OF RELOCATED EQUIPMENT.
3. ALL OPENINGS CREATED BY THE ABANDONMENT OR REMOVAL OF EXISTING SYSTEMS SHALL BE PATCHED TO MATCH EXISTING.

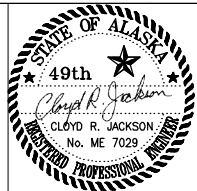
**KEY NOTES:**

1. RELOCATE EF-3, LOUVER AND ALL RELATED APPURTENANCES AND PATCH 14E DUCTWORK FOR CONTINUITY. PATCH WALL OPENING TO MATCH EXISTING.
2. COMPLETELY REMOVE INDICATED DUCTWORK AND RELATED APPURTENANCES AND COORDINATE WITH INSTALLATION OF NEW WORK INDICATED IN DWG M1.02.

**HVAC DEMOLITION PLAN** ①  
 SCALE: 1/8" = 1'-0"  
 8' 0 8' 16'  
 SCALE: 1/8"=1'-0"



ONE INCH AT FULL SIZE  
 1"  
 IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

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 Juneau, Alaska 99801  
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 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

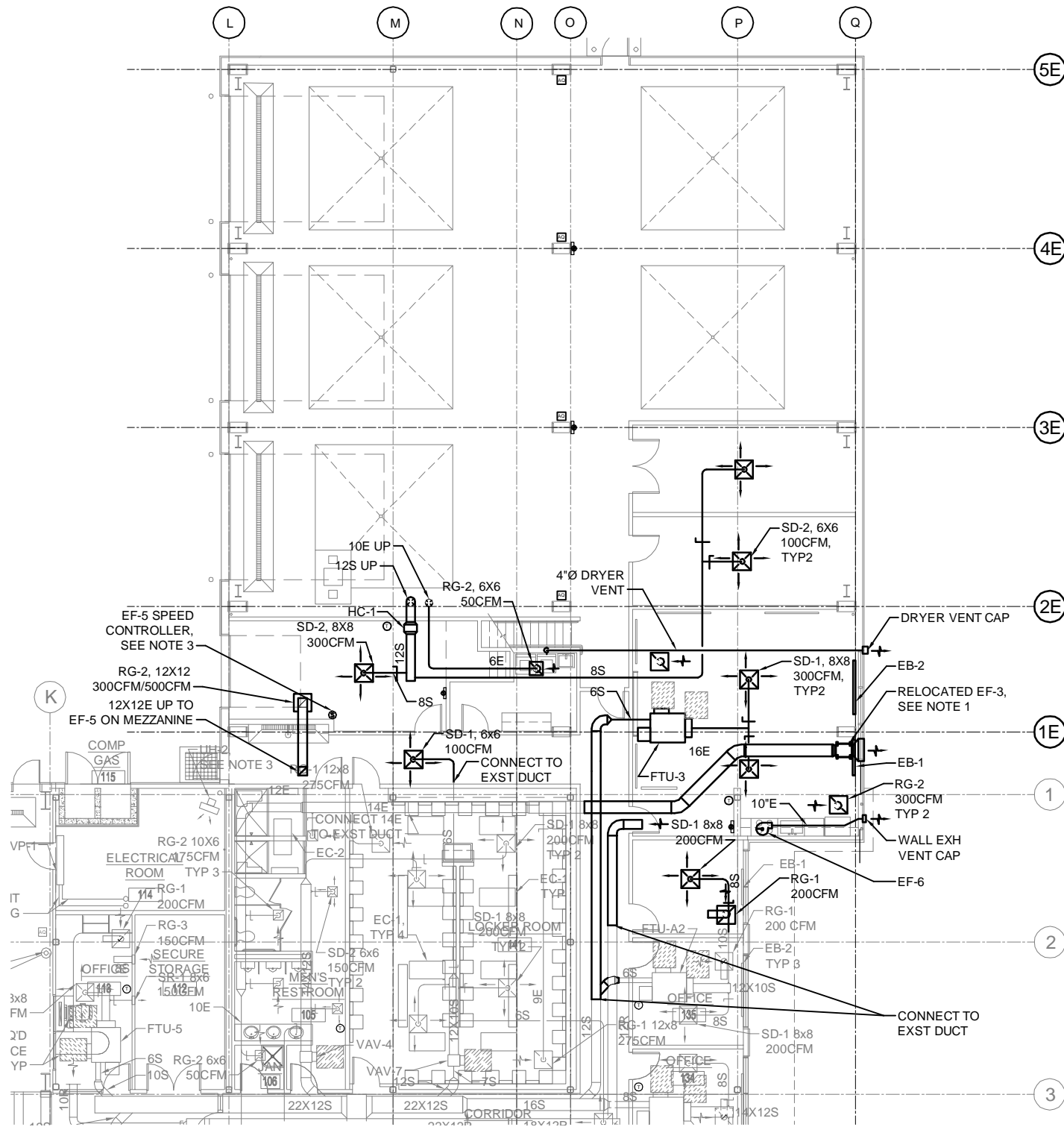
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 STREETS WING ADDITION,  
 E10-273

MECHANICAL  
 HVAC DEMOLITION  
 PLAN

SHEET NO.  
**M1.01**  
 TOTAL SHEETS  
 32 - 72

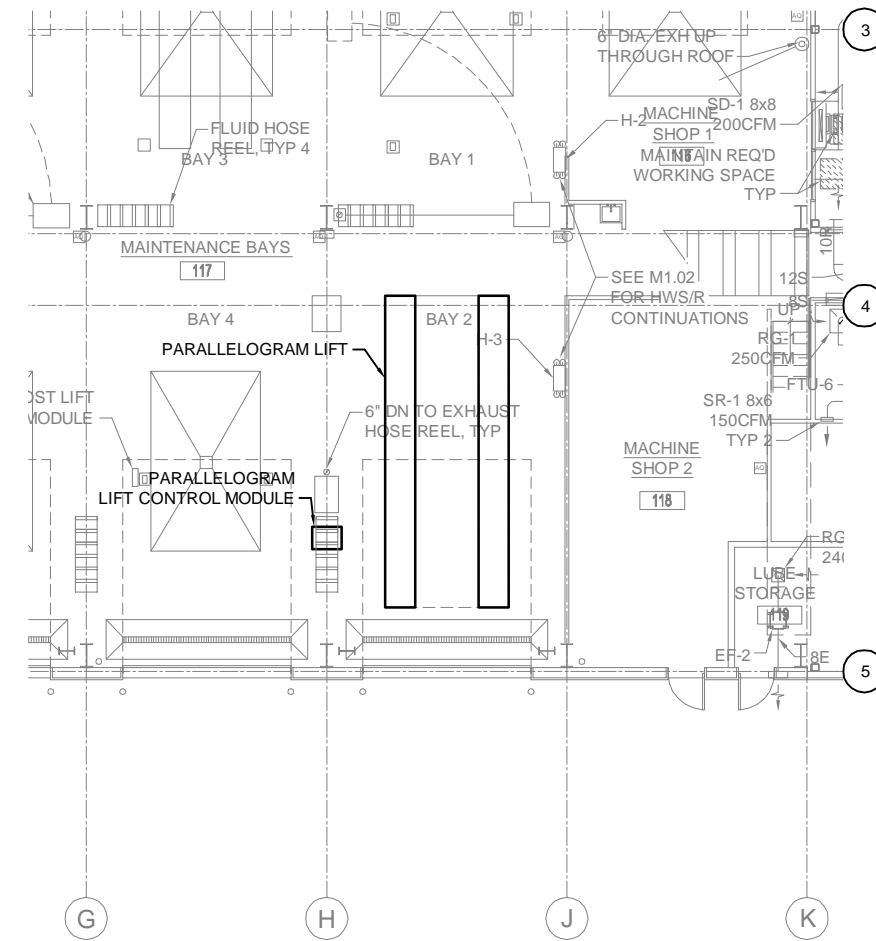
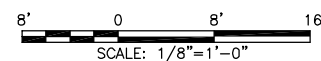
**NOTES:**

1. RELOCATE EF-3, LOUVER AND RELATED APPURTENANCES. BALANCE EF-3 TO 1325CFM.
2. SEE P1.02 FOR RADIANT FLOOR ZONING.
3. PROVIDE WALL SPEED CONTROLLER WITH 300CFM IN LOW SPEED POSITION AND 500CFM IN HIGH SPEED POSITION.
4. PROVIDE RIGID GALVANIZED DRYER DUCT WITH MAXIMUM NUMBER OF BENDS TO NOT EXCEED TWO 90° ELBOWS. USE TYPE A VENT HOOD WITH NO MESH SCREEN.
5. REBALANCE FTU-A2 TO 400CFM
6. PER ADDITIVE ALTERNATE #1, INSTALL PARALLELOGRAM VEHICLE LIFT IN ROOM 117, BAY 2 OF THE EXISTING MAINTENANCE BAYS AREA.



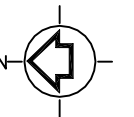
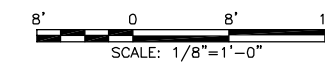
**1ST FLOOR HVAC PLAN**

SCALE: 1/8" = 1'-0"

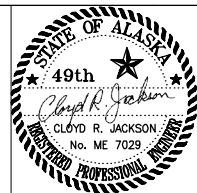


**ADD. ALTERNATE #1**

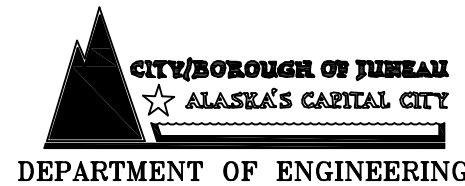
SCALE: 1/8" = 1'-0"



ONE INCH AT FULL SIZE  
1" = 1'  
IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

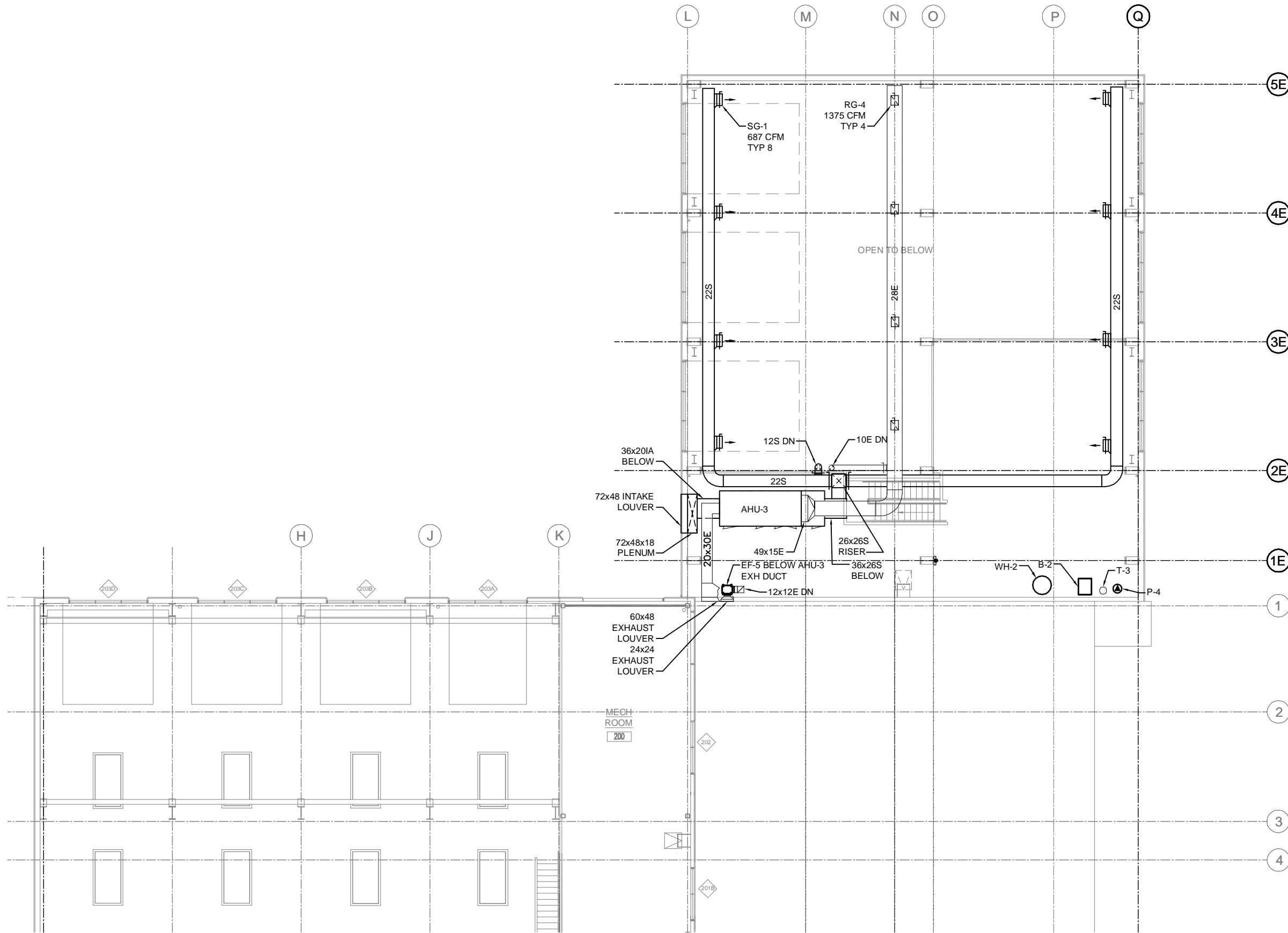


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E10-273

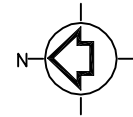
MECHANICAL  
FIRST FLOOR  
HVAC PLAN

SHEET NO.  
**M1.02**  
TOTAL SHEETS  
33 - 72

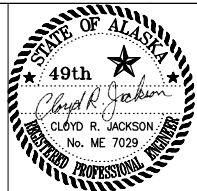
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**2ND FLOOR HVAC PLAN** 1  
 SCALE: 1/8" = 1'-0"  
 8' 0 8' 16'  
 SCALE: 1/8"=1'-0"



ONE INCH AT FULL SIZE  
 1"  
 IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

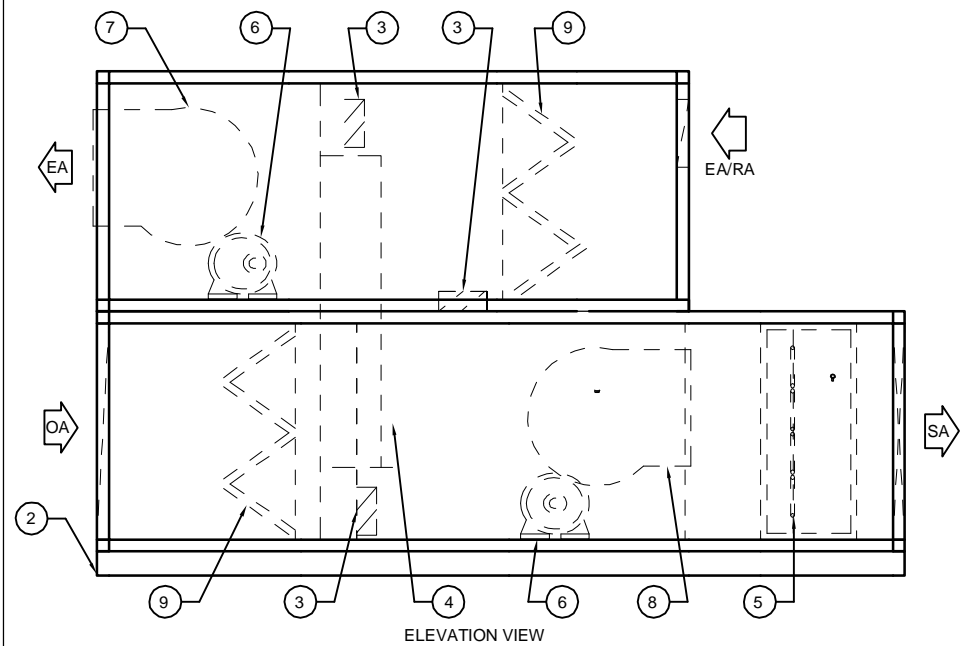
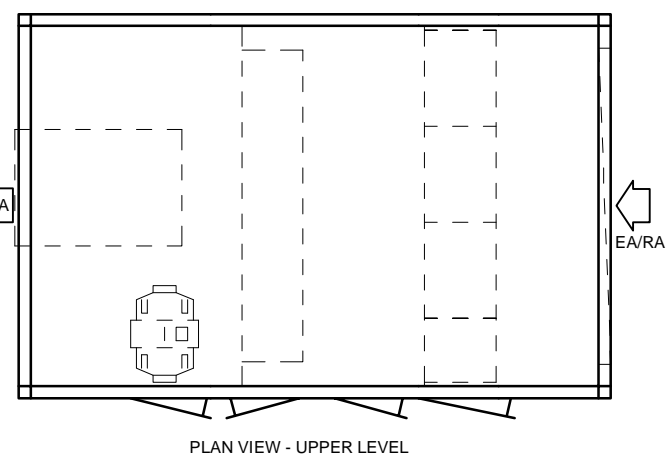
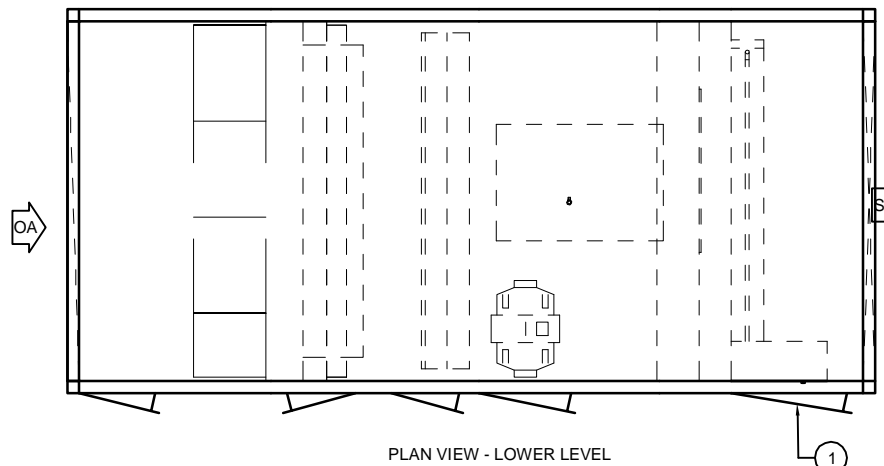
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 230 South Franklin, Suite 212  
 Juneau, Alaska 99801  
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**CITY/BOROUGH OF JUNEAU**  
 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

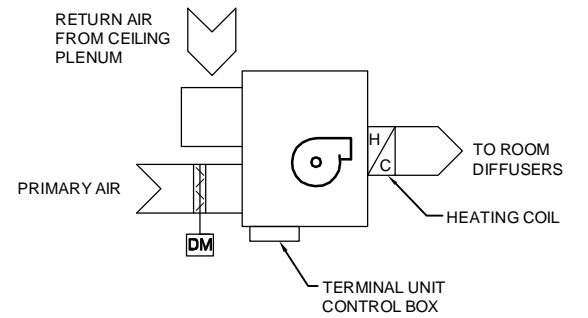
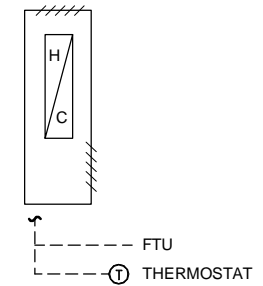
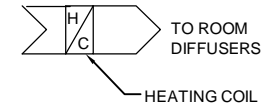
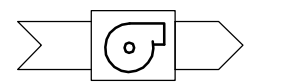
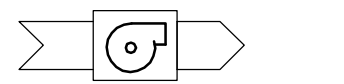
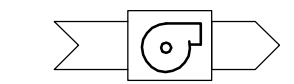
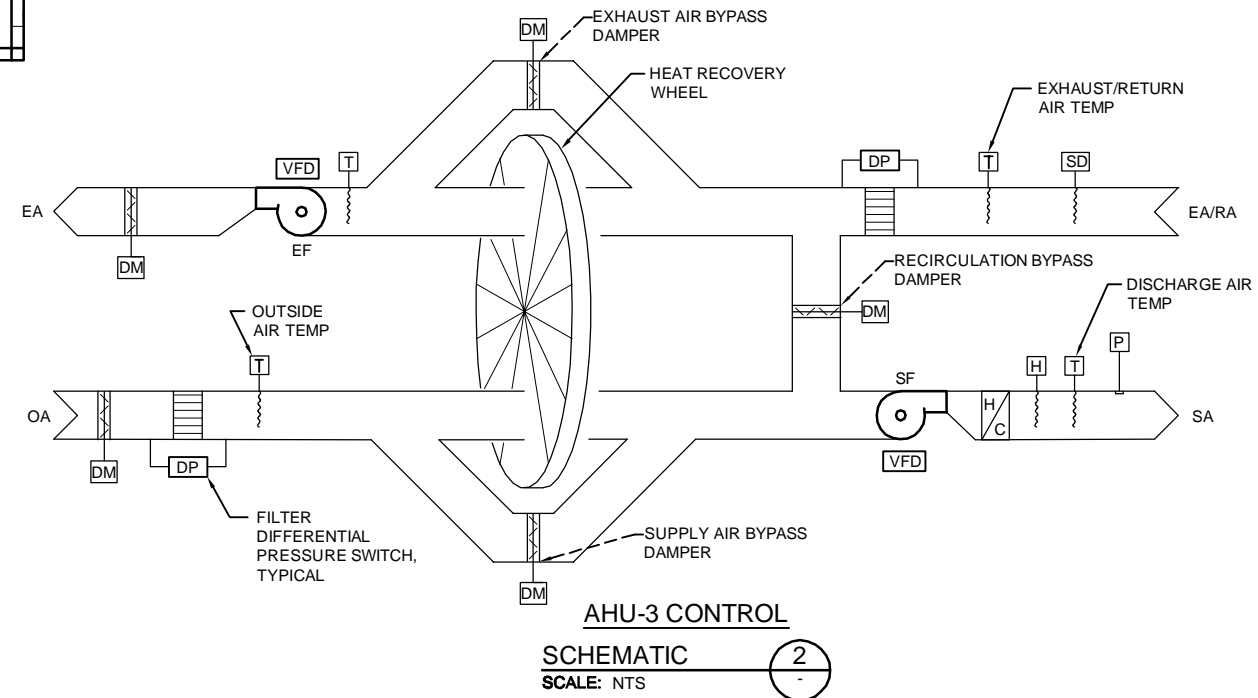
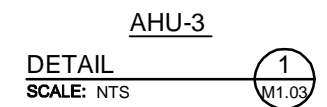
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 E10-273

MECHANICAL  
 SECOND FLOOR  
 HVAC PLAN

SHEET NO.  
**M1.03**  
 TOTAL SHEETS  
 34 - 72



- LEGEND**
- ① ACCESS DOORS
  - ② BASE RAIL
  - ③ DAMPER
  - ④ HEAT RECOVERY WHEEL
  - ⑤ HEATING COIL
  - ⑥ MOTOR
  - ⑦ RETURN OR EXHAUST FAN
  - ⑧ SUPPLY FAN
  - ⑨ FILTER BANK



NOTES:  
1. CONTINUOUS OPERATION

③ SPEED CONTROLLER IN ROOM  
LOW (300CFM)/HIGH(500CFM)

⑤ LOCAL VARIABLE SPEED CONTROL

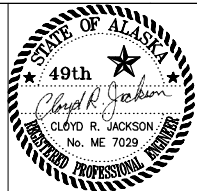
① ROOM SENSOR

NOTES:  
1. INTERLOCK WITH FTU AS  
SECOND STAGE OF HEATING

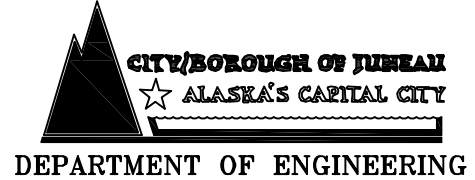
① ROOM SENSOR

ONE INCH AT FULL  
SIZE  
1" = 1'  
IF NOT ONE INCH,  
SCALE ACCORDINGLY

Path: S:\Active\3010019 - CBU PW Facility Mechanical\CBU CO M501-DETAILS.dwg Plot date: May 21, 2010 - 03:58:55pm CAD User: vmoosville  
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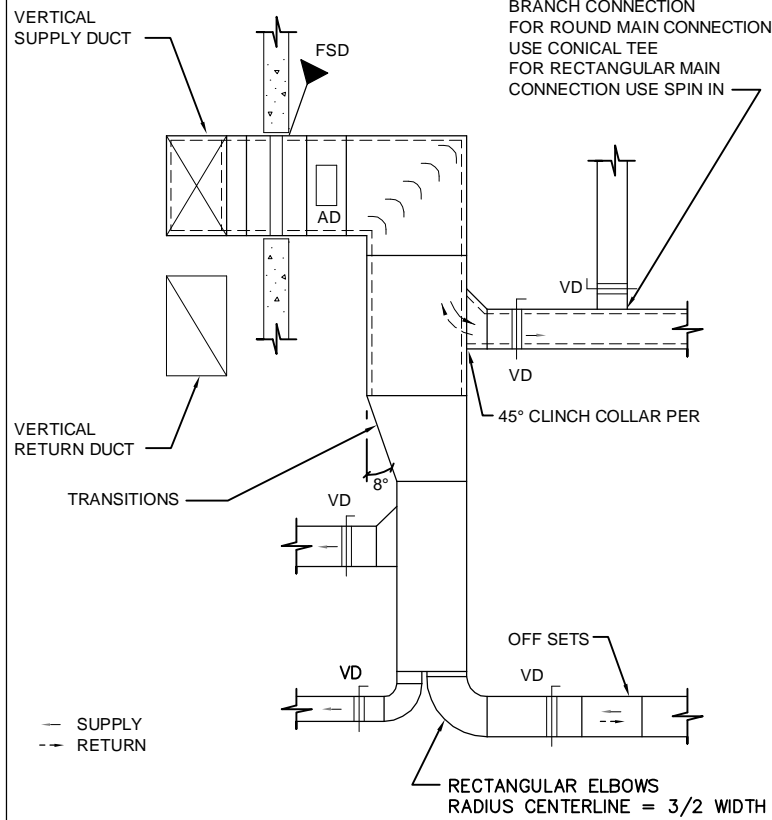
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WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

MECHANICAL  
HVAC DETAILS AND  
SCHEMATICS

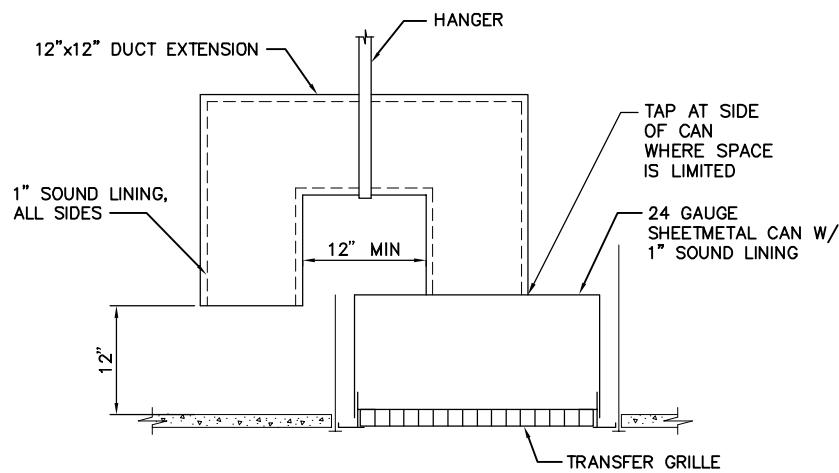
SHEET NO.  
**M5.01**  
TOTAL SHEETS  
35 - 72



REFERENCED FIGURES REFER TO FIGURES IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS

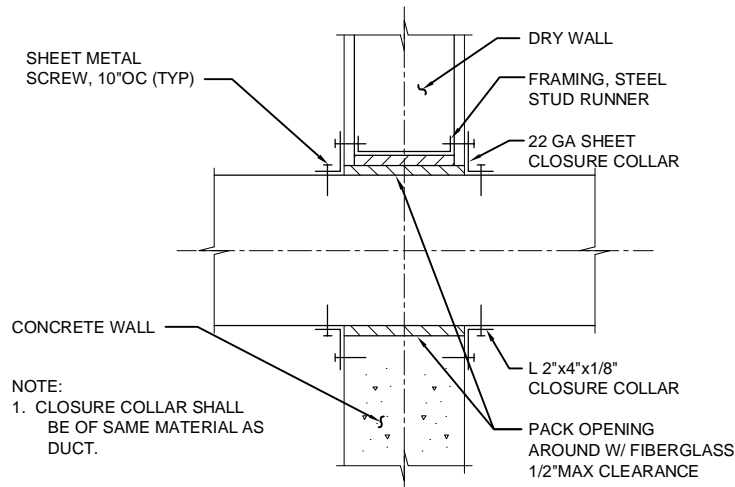
**TYPICAL SUPPLY OR RETURN DUCT**

DETAIL SCALE: NTS **1** TYP



**TRANSFER GRILLE**

DETAIL SCALE: NTS **5** TYP

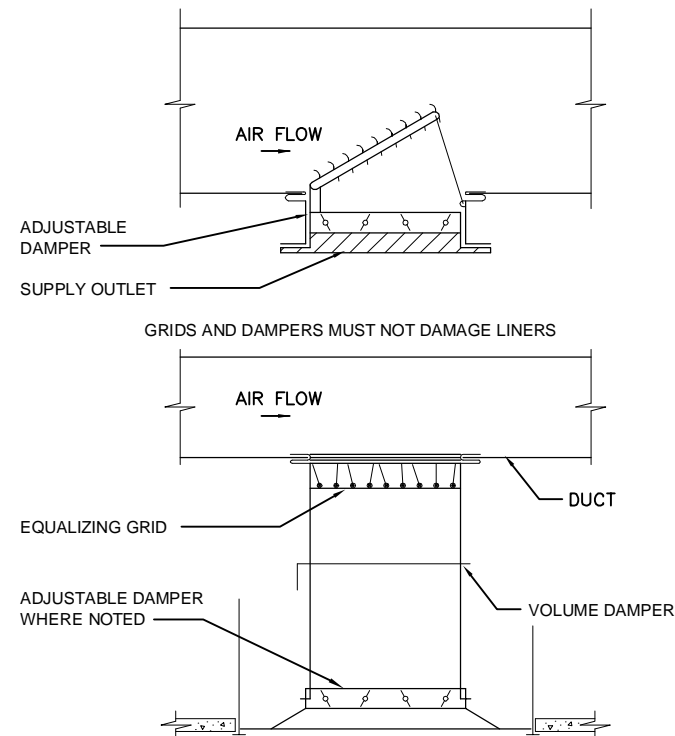


NOTE:

1. CLOSURE COLLAR SHALL BE OF SAME MATERIAL AS DUCT.

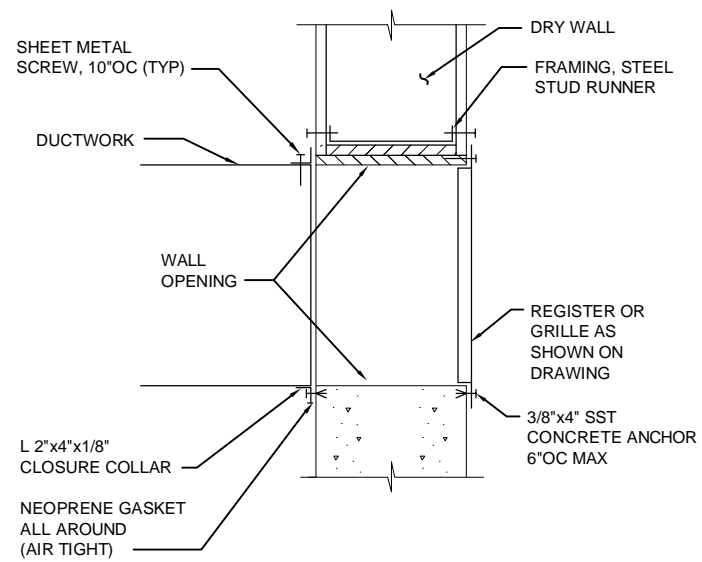
**WALL PENETRATION**

DETAIL SCALE: NTS **2** TYP



**TYPICAL DUCT MOUNTED DIFFUSERS**

DETAIL SCALE: NTS **6** TYP

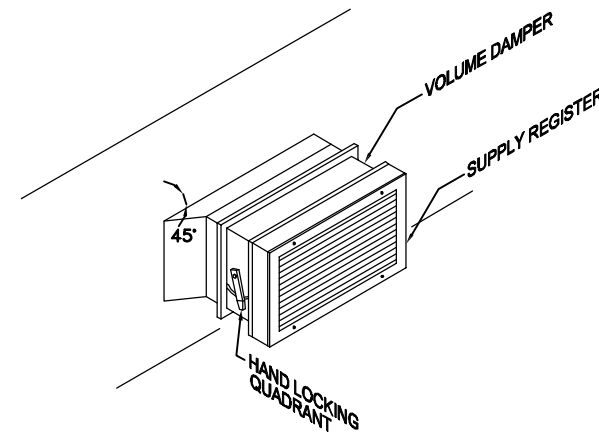


NOTES:

1. SIMILAR INSTALLATION FOR: BACK TO BACK GRILLE, DUCTWORK ATTACHED TO WALL OPENING, AND SINGLE WALL OPENING.
2. PROVIDE FIRE DAMPERS AND VOLUME DAMPERS WHERE SHOWN ON FLOOR PLANS.
3. CLOSURE COLLAR SHALL BE OF SAME MATERIAL AS DUCT.

**WALL MOUNTED GRILLE AND REGISTER**

DETAIL SCALE: NTS **3** TYP

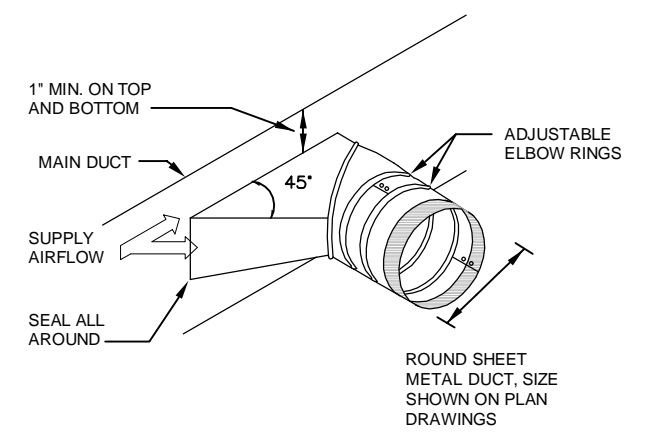


NOTES:

1. REFER TO PLAN DRAWINGS FOR MOUNTING ANGLE ON ROUND DUCT.

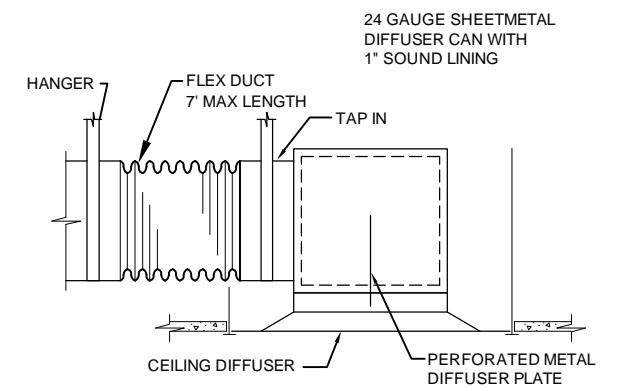
**SUPPLY GRILLE (SG-1)**

DETAIL SCALE: NTS **7** TYP



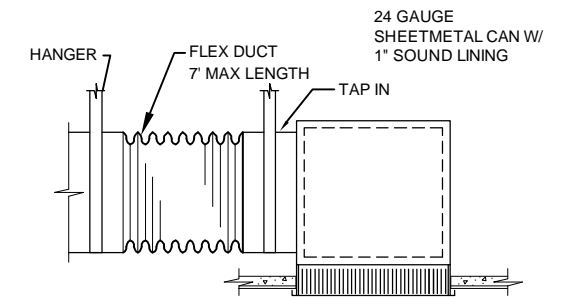
**TYP FTU SUPPLY DUCT TAKE OFF**

DETAIL SCALE: NTS **4** TYP



**TYP CEILING MOUNTED SQUARE NECK DIFFUSER**

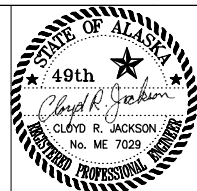
DETAIL SCALE: NTS **8** TYP



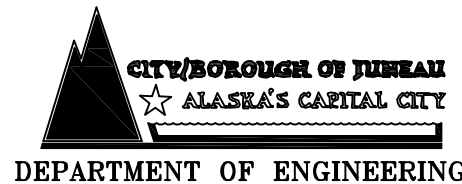
**TYP CEILING MOUNTED RETURN/EXHAUST GRILLE**

DETAIL SCALE: NTS **8** TYP

ONE INCH AT FULL SIZE  
1"  
IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

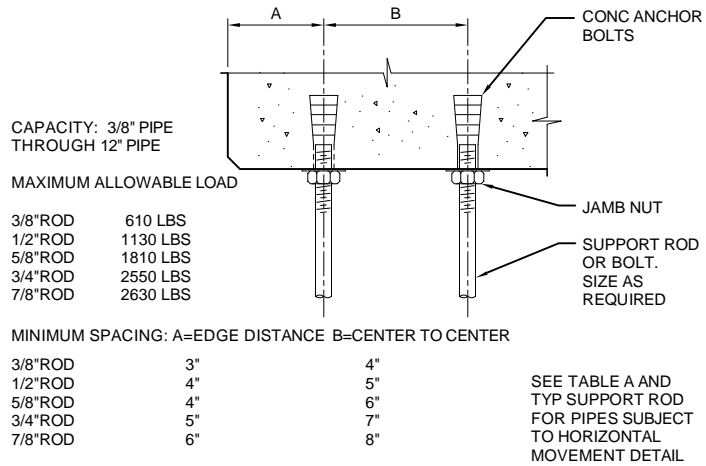


CONSOLIDATED PUBLIC WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

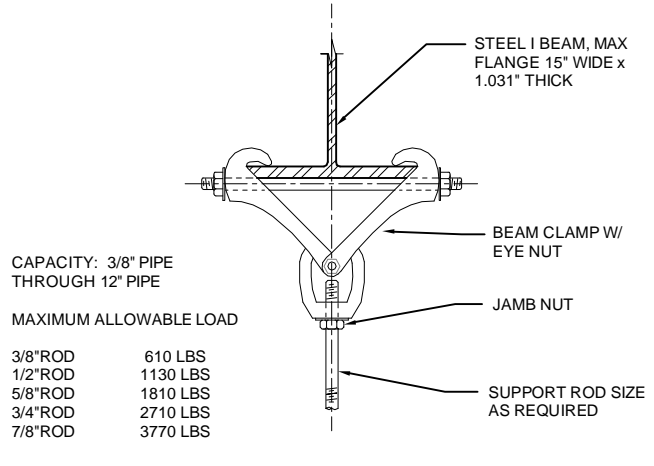
MECHANICAL  
TYPICAL DETAILS  
DUCTWORK

SHEET NO.  
**M5.02**  
TOTAL SHEETS  
36 - 72

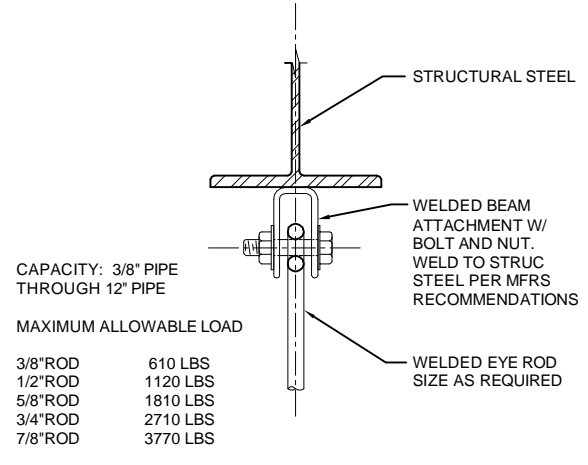
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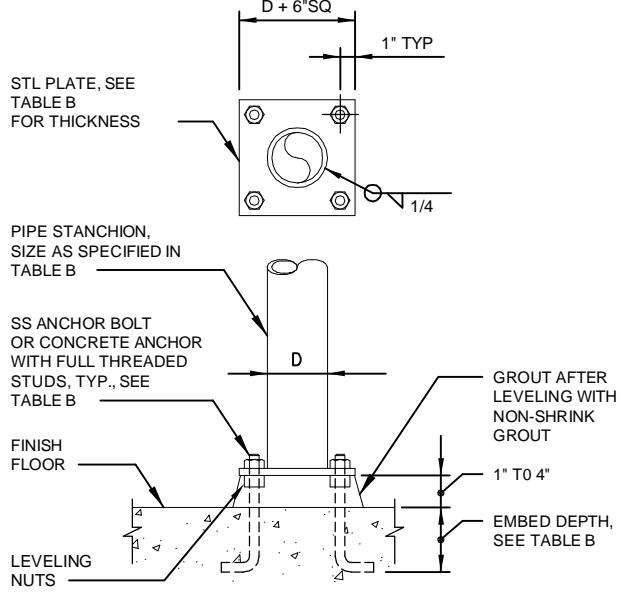
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 DETAIL  
 SCALE: NTS



**TYPE B**  
 DETAIL  
 SCALE: NTS



**TYPE C**  
 DETAIL  
 SCALE: NTS



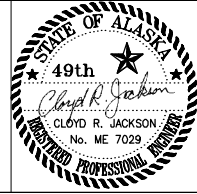
**TYPICAL STRUCTURAL ATTACHMENT**  
 DETAIL  
 SCALE: NTS

PIPE SIZE	DESIGN WEIGHT	SUPPORT ROD SIZE BASED ON SINGLE ROD SEE NOTE 1	MAXIMUM SPAN, IN FEET, FOR PIPES NOT IN RACKS SEE NOTE 2.			
			STEEL	COPPER	PLASTIC SEE NOTE 3	CAST IRON SEE NOTE 4
3/8" TO 3/4"	275 LBS	3/8"	5	5	CONTINUOUS	—
1"	275 LBS	3/8"	7	6	5	—
1-1/4"	300 LBS	3/8"	7	7	5	—
1-1/2"	300 LBS	3/8"	9	8	5	—
2"	325 LBS	3/8"	10	8	6	—
2-1/2"	375 LBS	1/2"	10	9	6	—
3"	575 LBS	1/2"	10	10	7	—
4"	600 LBS	5/8"	10	10	7	—
6"	750 LBS	3/4"	10	10	9	—
8"	950 LBS	7/8"	10	10	9	—

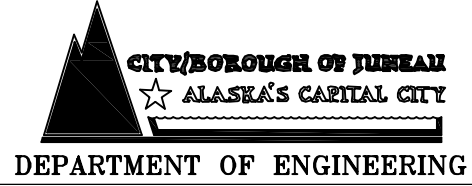
- NOTES: (TABLE A)
- ROD SIZE IS BASED ON CARRYING SINGLE PIPE. WHEN MORE THAN ONE PIPE IS TO BE SUPPORTED, RODS SHALL BE SIZED USING DESIGN WEIGHTS TO DETERMINE TOTAL LOAD.
  - WHERE MODULARLY SPACED INSERTS ARE REQUIRED SUPPORT PIPES AT INSERT MODULE. NO SPECIAL INSERTS WILL BE ALLOWED FOR INDIVIDUAL PIPE SUPPORTS UNLESS SPECIFICALLY DETAILED OR AUTHORIZED BY THE PROJECT REP.
  - SPACING BASED ON SCHEDULE 80 PIPE AT 100°F. SCHEDULE 40 PIPE OR HIGHER TEMPERATURE REQUIRE SHORTER SPANS. SEE MANUFACTURER'S RECOMMENDATIONS.
  - INSTALL AT LEAST ONE HANGER PER PIPE LENGTH. LOCATE AS NEAR THE JOINT OR FITTING AS POSSIBLE.
  - IN ADDITION TO SUPPORTING DUCTS AND PIPES FOR GRAVITY LOADS, DUCTS AND PIPES SHALL BE SUPPORTED TO RESIST VERTICAL, LATERAL AND LONGITUDINAL SEISMIC FORCES. FORCES ARE TO BE DETERMINED ACCORDING TO 2006 INTERNATIONAL BUILDING CODE. SEISMIC BRACE DESIGN SHALL BE ACCORDING TO THE LATEST "SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS" BY SMACNA. THE DESIGN FOR SEISMIC SUPPORTS SHALL BE STAMPED AND SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE OF ALASKA.
  - DESIGN WEIGHTS REFER TO THE PIPE SIZE SHOWN SUPPORTED AT THE SPACING LISTED AND SHALL BE USED FOR DESIGN OF ALL SPECIAL HANGER SYSTEMS.
  - AT LEAST ONE PIPE HANGER OR SUPPORT SHALL BE LOCATED IMMEDIATELY ADJACENT TO THE JOINT OF ANY CONCENTRATED LOAD OR BEND IN THE PIPE SUCH AS VALVES, FITTINGS, ETC., IN ADDITION TO THE MAXIMUM SPANS LISTED ABOVE.
  - TYPICAL DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. REFER TO SPECIFICATION SECTION 15071 FOR SEISMIC DESIGN REQUIREMENTS.

PIPE SIZE	NOMINAL PIPE STANCHION DIA (SCHEDULE 40)	PLATE THICKNESS	BOLT SIZE	BOLT EMBED
2"	1 1/2"	1/4"	3/8"	5"
2 1/2"	1 1/2"	1/4"	3/8"	5"
3"	2"	3/8"	1/2"	5"
4"	3"	3/8"	1/2"	5"
6"	3"	3/8"	1/2"	5"
8"	4"	3/8"	5/8"	8"
10"	4"	3/8"	5/8"	8"
12"	6"	3/8"	5/8"	8"
14"	6"	1/2"	3/4"	8"
16"	6"	1/2"	3/4"	8"
18"	8"	5/8"	7/8"	8"
20"	8"	5/8"	7/8"	8"
24"	8"	3/4"	1"	8"
30"	10"	3/4"	1"	8"

ONE INCH AT FULL SIZE  
 1" TYP  
 IF NOT ONE INCH, SCALE ACCORDINGLY



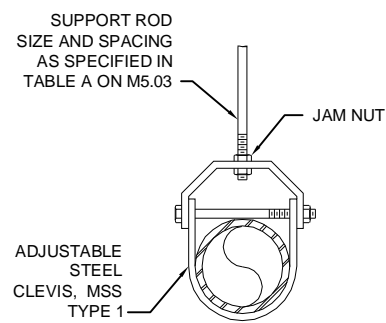
DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010



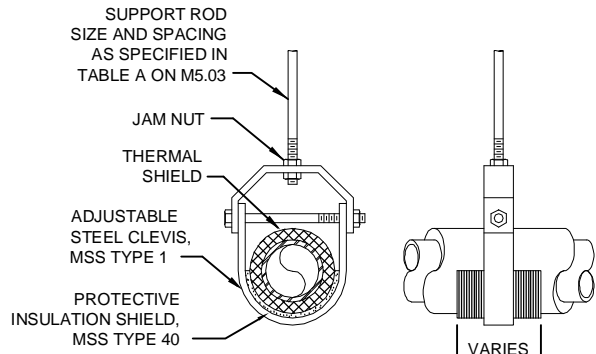
CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

MECHANICAL HVAC DETAILS AND SCHEMATICS

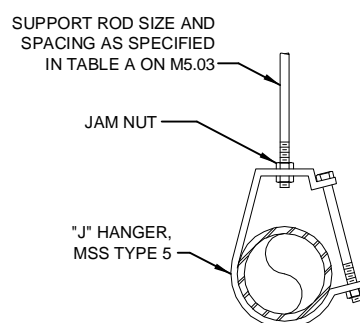
SHEET NO. M5.03  
 TOTAL SHEETS 37 - 72



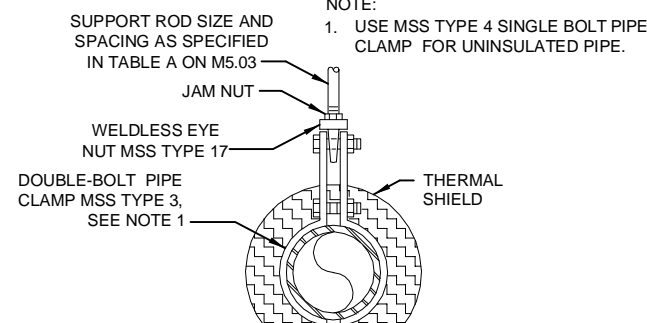
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DETAIL  
SCALE: NTS



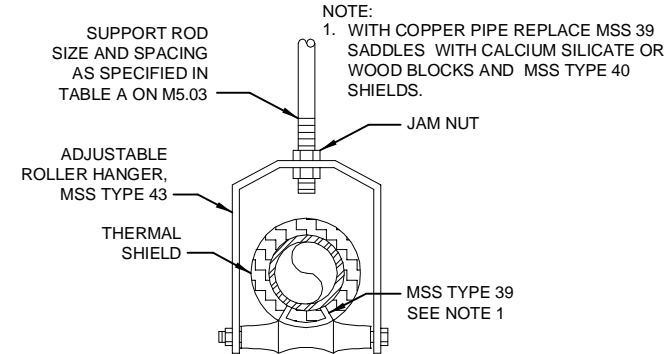
**TYPE 1A**  
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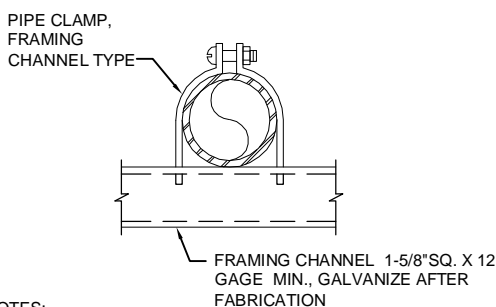
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DETAIL  
SCALE: NTS



**TYPE 3**  
DETAIL  
SCALE: NTS

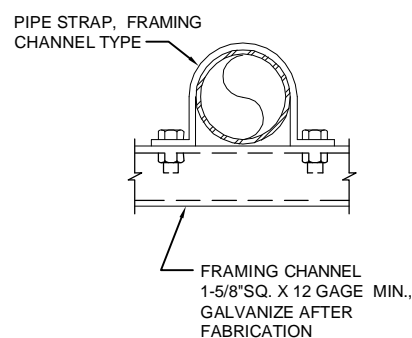


**TYPE 4**  
DETAIL  
SCALE: NTS

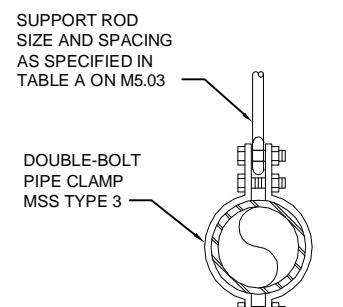


NOTES:  
1. DO NOT USE FOR HORIZONTAL PIPES LARGER THAN 2" WHEN FRAMING CHANNEL IS MOUNTED VERTICALLY.

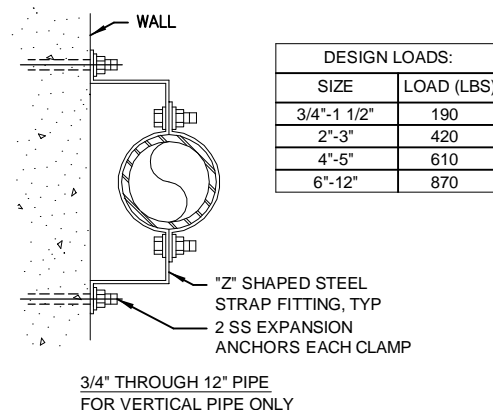
**TYPE 5**  
DETAIL  
SCALE: NTS



**TYPE 6**  
DETAIL  
SCALE: NTS

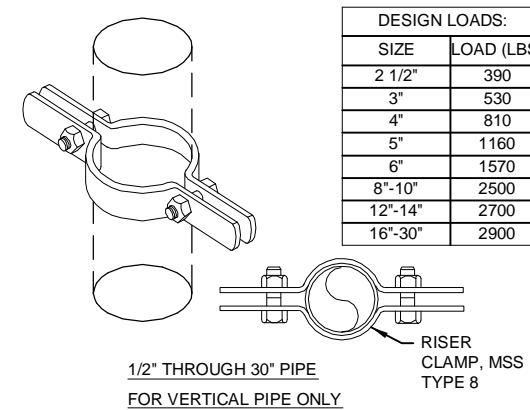


**TYPE 7**  
DETAIL  
SCALE: NTS

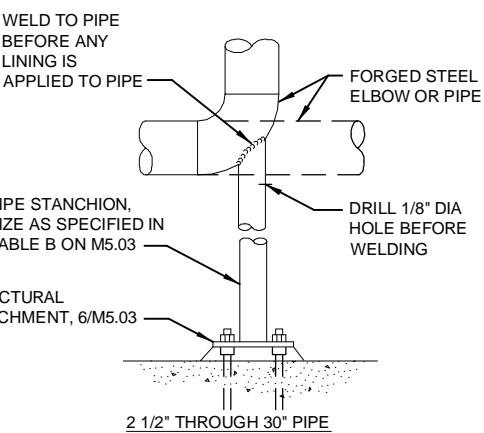


DESIGN LOADS:	
SIZE	LOAD (LBS)
2 1/2"	390
3"	530
4"	810
5"	1160
6"	1570
8"-10"	2500
12"-14"	2700
16"-30"	2900

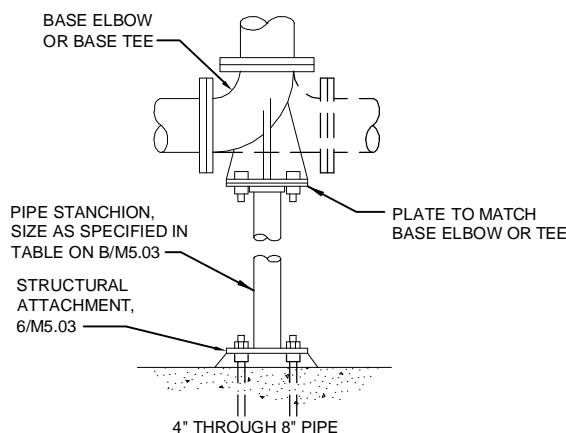
**TYPE 8**  
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SCALE: NTS



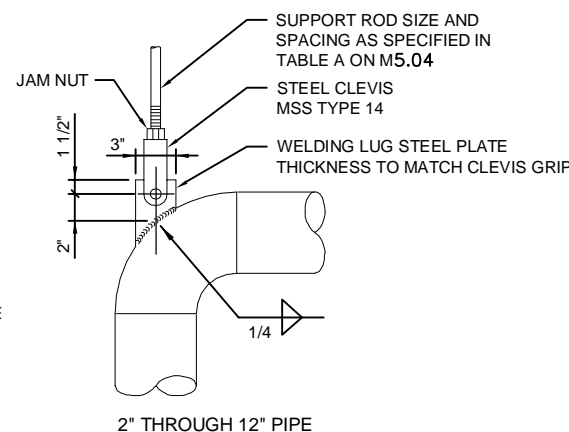
**TYPE 9**  
DETAIL  
SCALE: NTS



**TYPE 10**  
DETAIL  
SCALE: NTS

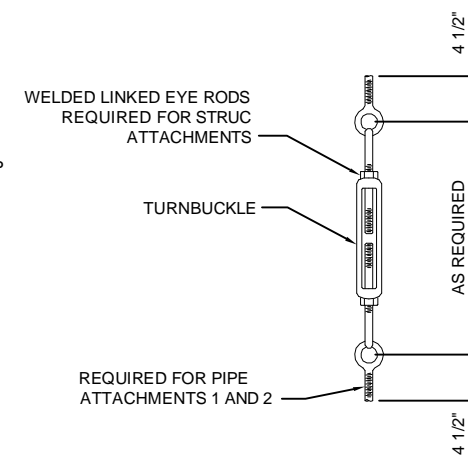


**TYPE 11**  
DETAIL  
SCALE: NTS



NOTE:  
1. LUG SHALL BE WELDED TO PIPE BEFORE INTERNAL LINING IS APPLIED.

**TYPE 12**  
DETAIL  
SCALE: NTS

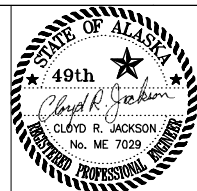


**TYP SUPPORT ROD**  
DETAIL  
SCALE: NTS

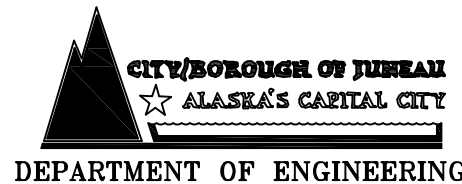
**GENERAL NOTES:**

- WITH COPPER PIPE PROVIDE A FULL 360° WRAP OF 1/16 INCH THICK NEOPRENE BONDED TO PIPE WITH A COMPATIBLE WATERPROOF ADHESIVE. FOR REQUIREMENTS ON INSULATION USED WITH PIPE HANGERS.
- PIPE HANGERS SHALL BE OVERSIZED AS REQUIRED TO ACCOMMODATE THICKNESS OF INSULATION SPECIFIED. HANGER SHALL NOT COME INTO CONTACT WITH THE INSULATION DIRECTLY, EITHER AT THE VERTICAL YOKE OR AT THE POINT OF SUPPORT. SEE SPECIFICATIONS.
- REFER TO SPECIFICATION SECTION 15071 FOR SEISMIC DESIGN REQUIREMENTS.

ONE INCH AT FULL SIZE  
1" = 1"  
IF NOT ONE INCH, SCALE ACCORDINGLY



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CONSOLIDATED PUBLIC WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

MECHANICAL  
TYPICAL DETAILS  
PIPE HANGERS

SHEET NO.  
**M5.04**  
TOTAL SHEETS  
38 - 72

AIR HANDLING UNIT (AHU) SCHEDULE																														
SYMBOL	LOCATION	SERVICE	WEIGHT (LBS)	SUPPLY FAN - DRAW THRU						RETURN FAN						ELECTRIC HEATING COIL				HEAT EXCHANGER				FILTERS					SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)	
				AIRFLOW (CFM)	TOTAL STATIC PRESSURE (IN W.C.)	EXTERNAL STATIC PRESSURE (IN W.C.)	ELECTRICAL			AIRFLOW (CFM)	TOTAL STATIC PRESSURE (IN W.C.)	EXTERNAL STATIC PRESSURE (IN W.C.)	ELECTRICAL			AIR TEMP (°F)		CAPACITY (KW)	VOLT-P-HZ	TYPE	MIN. SENSIBLE EFF. (%)	MOTOR			M E R V	QTY.	SIZE (IN)	PD (IN)		DEPTH (IN)
							BHP	HP	VOLT-P-HZ				BHP	HP	VOLT-P-HZ	ENT.	LVG.					HP	FLA	VOLT-P-HZ						
AHU-3	STREET WING	VARIABLE VOLUME	4500	6000	2.7	2.1	4.9	7.5	460-3-60	5550	2.1	1.0	3.8	5	460-3-60	28	70	80	460-3-60	WHEEL	63	0.25	0.4	460-3-60	7	48	24x20 16x20	0.08	2	YORK SOLUTIONS AIR HANDLING UNIT

- NOTES:**  
1. HEAT RECOVERY PERFORMANCE IS BASED ON COIL EAT 28°F WITH 29% RH ON BOTH SA AND RA.  
2. VFDs SHALL BE PROVIDED BY DDC CONTRACTOR AND INSTALLED IN THE FIELD.

FAN POWER TERMINAL UNIT SCHEDULE																	
SYMBOL	SIZE			CFM		NC LEVELS		FAN			ELECTRIC HEATING COIL		ELECTRICAL			MFR/MODEL	REMARKS
	UNIT	INLET	OUTLET	MAX	MIN	RAD	DISCH	CFM	ESP	HP	KW	EAT/LAT	VOLT	PH	HZ		
FTU-3	C	08	14.1x1.1	600	350	19	13	600	0.20	0.33	5.0	55/95	277	1	60	TITUS/DTFS-F	FTU-3 IS AN OWNER FURNISHED CONTRACTOR INSTALLED ITEM

- NOTES:**  
1. ROOM NC LEVEL SHOWN INCLUDES ATTENUATION TRANSFER FUNCTIONS FROM TABLES IN ARI STANDARD 885-89.  
2. SOUND DATA SHALL BE OBTAINED FROM TESTS CONDUCTED IN ACCORDANCE WITH ARI STANDARD 880-94.

FAN SCHEDULE															
SYMBOL	LOCATION	TYPE	AIRFLOW (CFM)	STATIC PRESSURE (IN W.C.)	DRIVE	FAN RPM	SOUND POWER (dBA)	MOTOR				CONTROL	MFR/MODEL	FEATURES	WEIGHT (LBS)
								HP	RPM	VOLT-P-HZ	ENCLOSURE				
EF-5	STREET WINGS MEZZANINE	INLINE	300/500	0.3	DIRECT	1521	54	1/10	1550	115-1-60	TEAO	TWO SPEED SWITCH	GREENHECK SQ-90-D	ADJUSTABLE SPEED FAN	41
EF-6	KITCHEN HOOD FAN	INLINE	600	0.5	DIRECT	-	-	1/6	-	120-1-60	-	VARIABLE SPEED CONTROL	FABER INCA PRO 30	REMOTE SWITCH W/ SPEED CONTROL	-

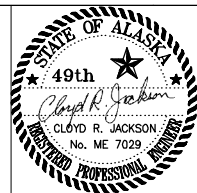
- NOTES:**  
1. KITCHEN HOOD SHALL INCLUDE TRIM WITH BAFFLE TYPE FILTERS AND LIGHTS.

ELECTRIC HEATER SCHEDULE									
SYMBOL	TYPE	LOCATION	CAPACITY (KW)	LENGTH (IN)	VOLT-P-HZ	AMPS	SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)		REMARKS
EB-1	BASEBOARD	LUNCH/TRAINING	1.0	48	277-1-60	3.6	MARKEL 3900 HYDRONIC ELECTRIC		REMOTE T'STAT
EB-2	BASEBOARD	LUNCH/TRAINING	1.5	72	277-1-60	5.4	MARKEL 3900 HYDRONIC ELECTRIC		REMOTE T'STAT
HC-1	DUCT HEATER	SIGN SHOP	4	-	277-1-60	8.3	NAILOR DH		SPACE THERMOSTAT

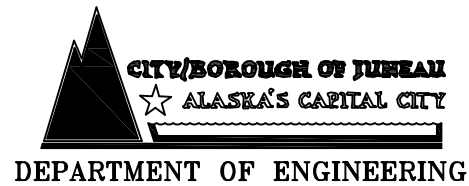
DIFFUSER/GRILLE/REGISTER SCHEDULE					
SYMBOL	TYPE	SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)	MAX NC	MAX APD (IN WC)	REMARKS
SD-1	CEILING MOUNT	TITUS MCD	30	0.1	-
SD-2	DUCT MOUNT	TITUS MCD	30	0.1	-
SG-1	DUCT MOUNT	TITUS 272RL	30	0.1	WITH OPPOSED BLADE DAMPER
RG-1	CEILING MOUNT	TITUS 350ZRL	30	0.1	-
RG-2	DUCT MOUNT	TITUS 350ZRL	30	0.1	-
RG-4	DUCT MOUNT	TITUS 350ZRL	30	0.1	-

- NOTES:**  
1. CEILING MOUNT TYPE SHALL BE MOUNTED ACCORDINGLY FOR 24" x 24" CEILING MODULE OR GYPBOARD CEILING PER REFLECTED CEILING PLAN. INCLUDE ANY ADDITIONAL APPURTENANCES AS NEEDED.

ONE INCH AT FULL SIZE  
1"  
IF NOT ONE INCH, SCALE ACCORDINGLY



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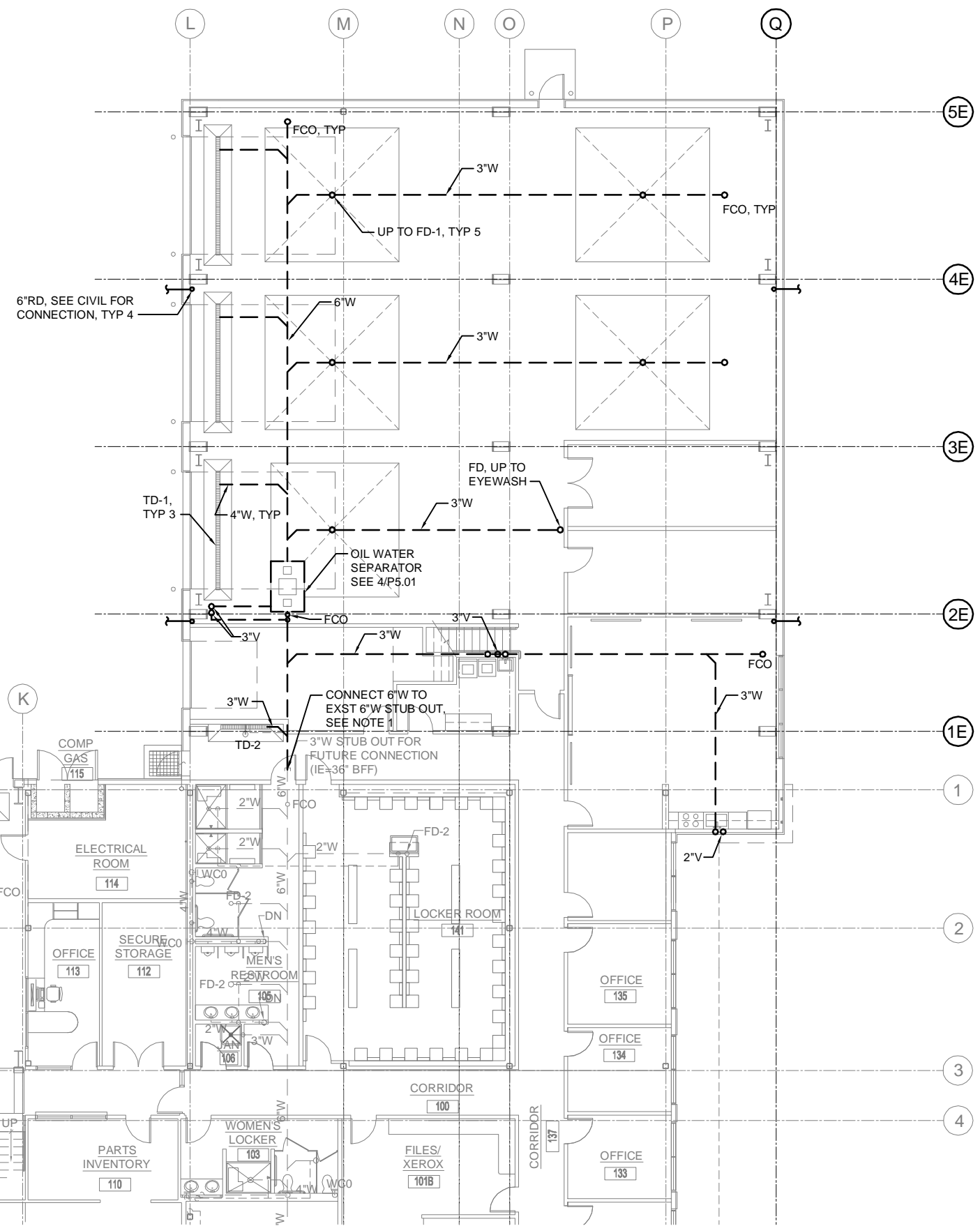


CONSOLIDATED PUBLIC WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

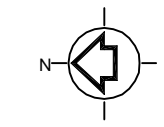
MECHANICAL HVAC EQUIPMENT SCHEDULES

SHEET NO. M6.01  
TOTAL SHEETS 39 - 72

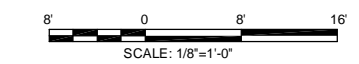
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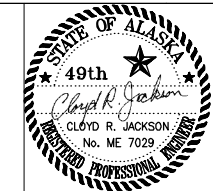
- NOTES:**
1. FIELD VERIFY EXACT SIZE AND LOCATION OF STUB OUT.
  2. RADIANT FLOOR HEATING SYSTEM UNDER SLAB IS NOT SHOWN. DESIGN SHALL BE PROVIDED BY CONTRACTOR IN COMPLIANCE WITH SECTION 15772.
  3. PROVIDE TRAP PRIMERS FOR ALL FLOOR DRAINS.
  4. PROVIDE ACCESS PANELS FOR ALL IN WALL TRAP PRIMERS.



**FOUNDATION PIPING PLAN**  
 SCALE: 1/8" = 1'-0"



ONE INCH AT FULL SIZE  
 1" = 1'-0"  
 IF NOT ONE INCH, SCALE ACCORDINGLY



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**TETRA TECH**  
 www.tetrattech.com  
 230 South Franklin, Suite 212  
 Juneau, Alaska 99801  
 Phone: 907-586-6400 Fax: 907-463-3677

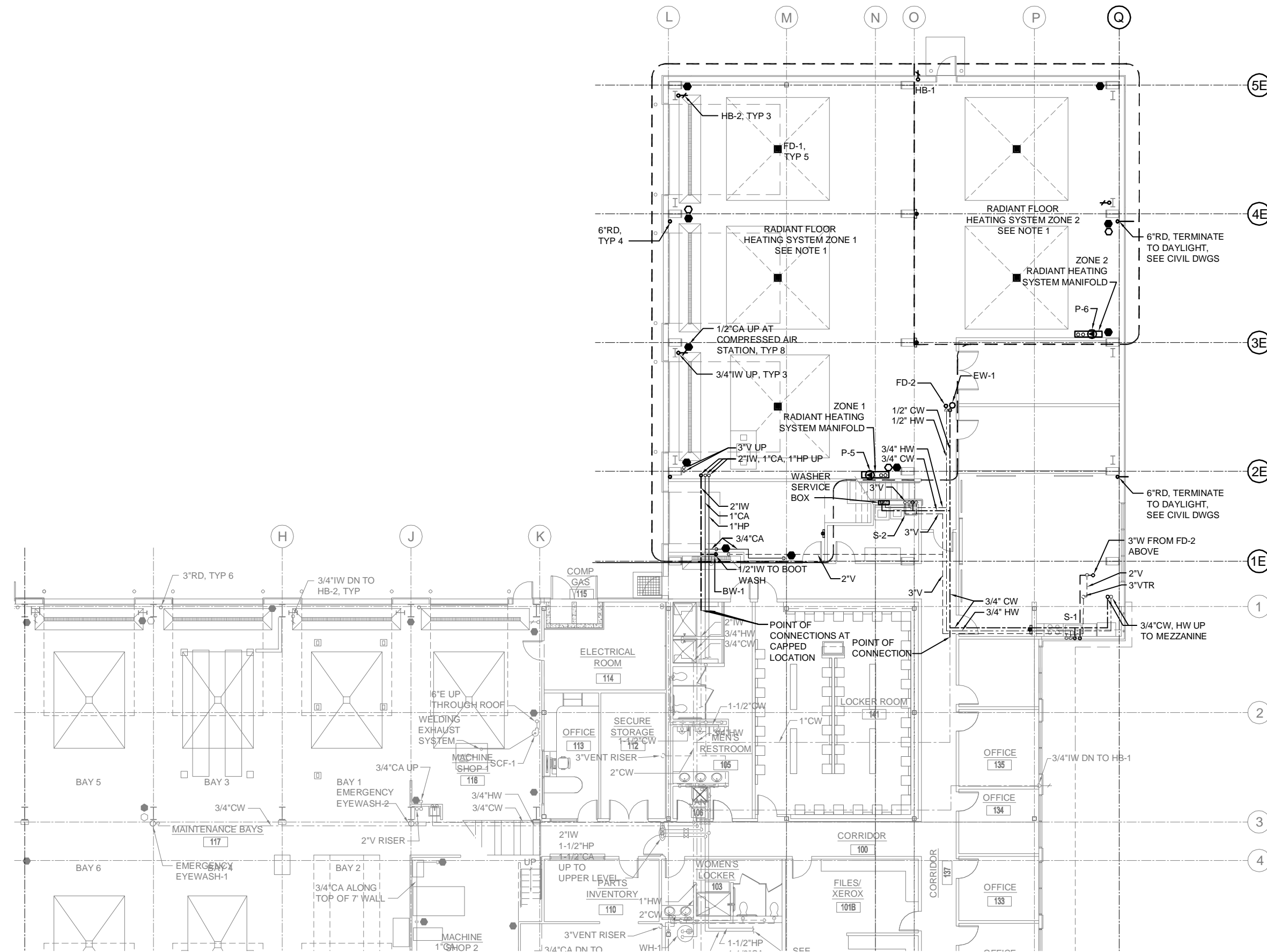
**CITY/BOROUGH OF JUNEAU**  
 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

**MECHANICAL FOUNDATION PIPING PLAN**

SHEET NO. **P1.01**  
 TOTAL SHEETS 40 - 72

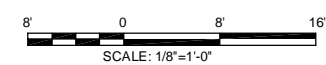
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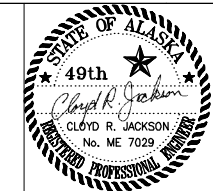
**NOTES:**  
 1. RADIANT FLOOR HEATING SYSTEM UNDER SLAB DESIGN (NOT SHOWN) SHALL BE PROVIDED BY CONTRACTOR IN COMPLIANCE WITH SECTION 15772.

**FIRST FLOOR PIPING PLAN**

SCALE: 1/8" = 1'-0"



ONE INCH AT FULL SIZE  
 1" = 1'  
 IF NOT ONE INCH, SCALE ACCORDINGLY



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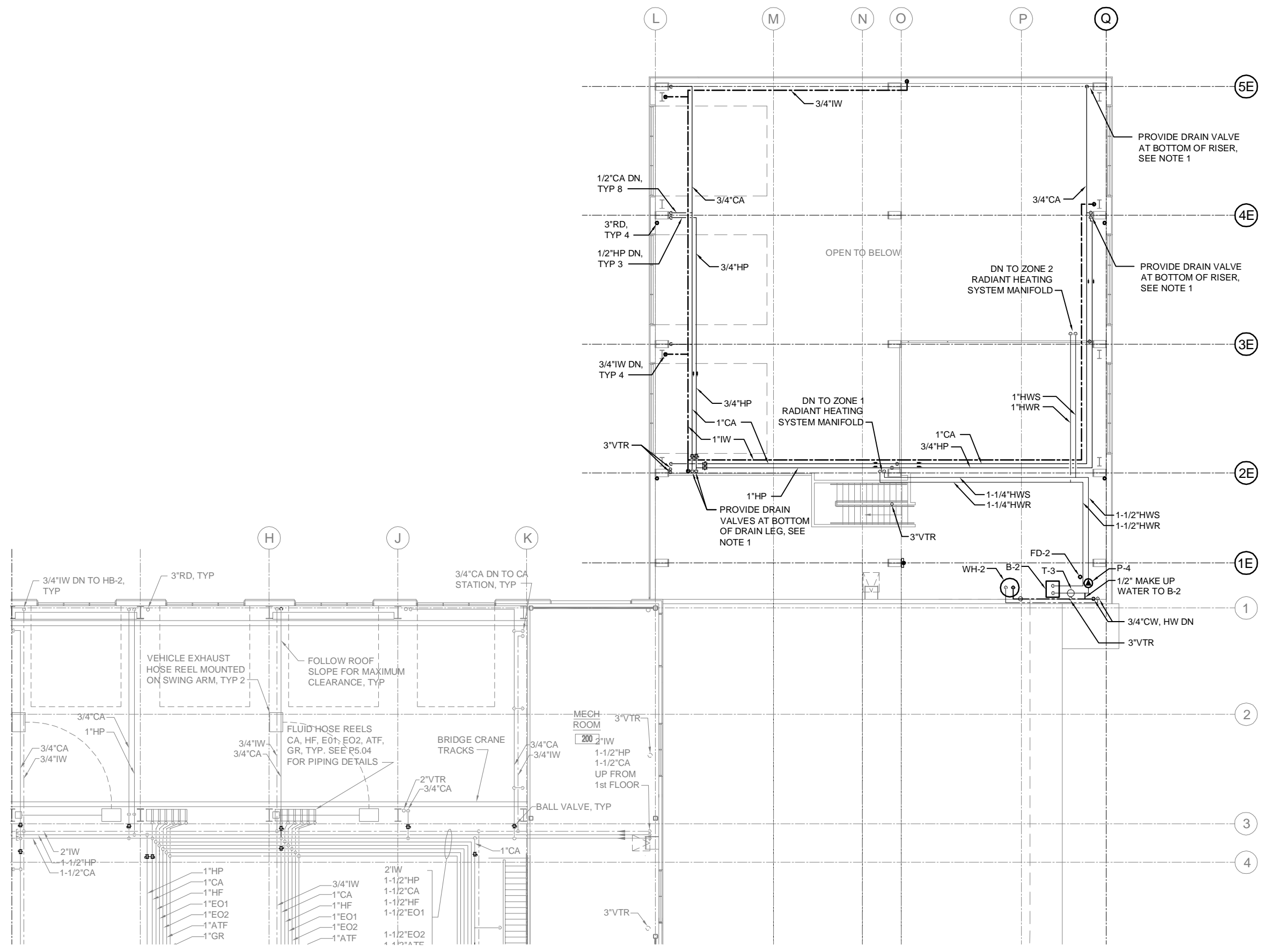
**CITY/BOROUGH OF JUNEAU**  
 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

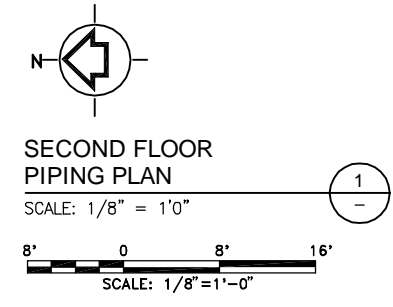
MECHANICAL  
 FIRST FLOOR  
 PIPING PLAN

SHEET NO.  
**P1.02**  
 TOTAL SHEETS  
 41 - 72

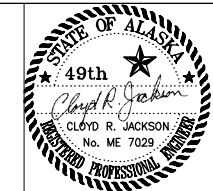
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**NOTES:**  
 1. SLOPE HP AND CA PIPING DOWN TOWARD DRAIN LEG AND PROVIDE DRAIN VALVE AT 3' AFF.



ONE INCH AT FULL SIZE  
 1" = 1'-0"  
 IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

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 Juneau, Alaska 99801  
 Phone: 907-586-6400 Fax: 907-463-3677

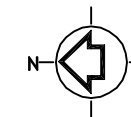
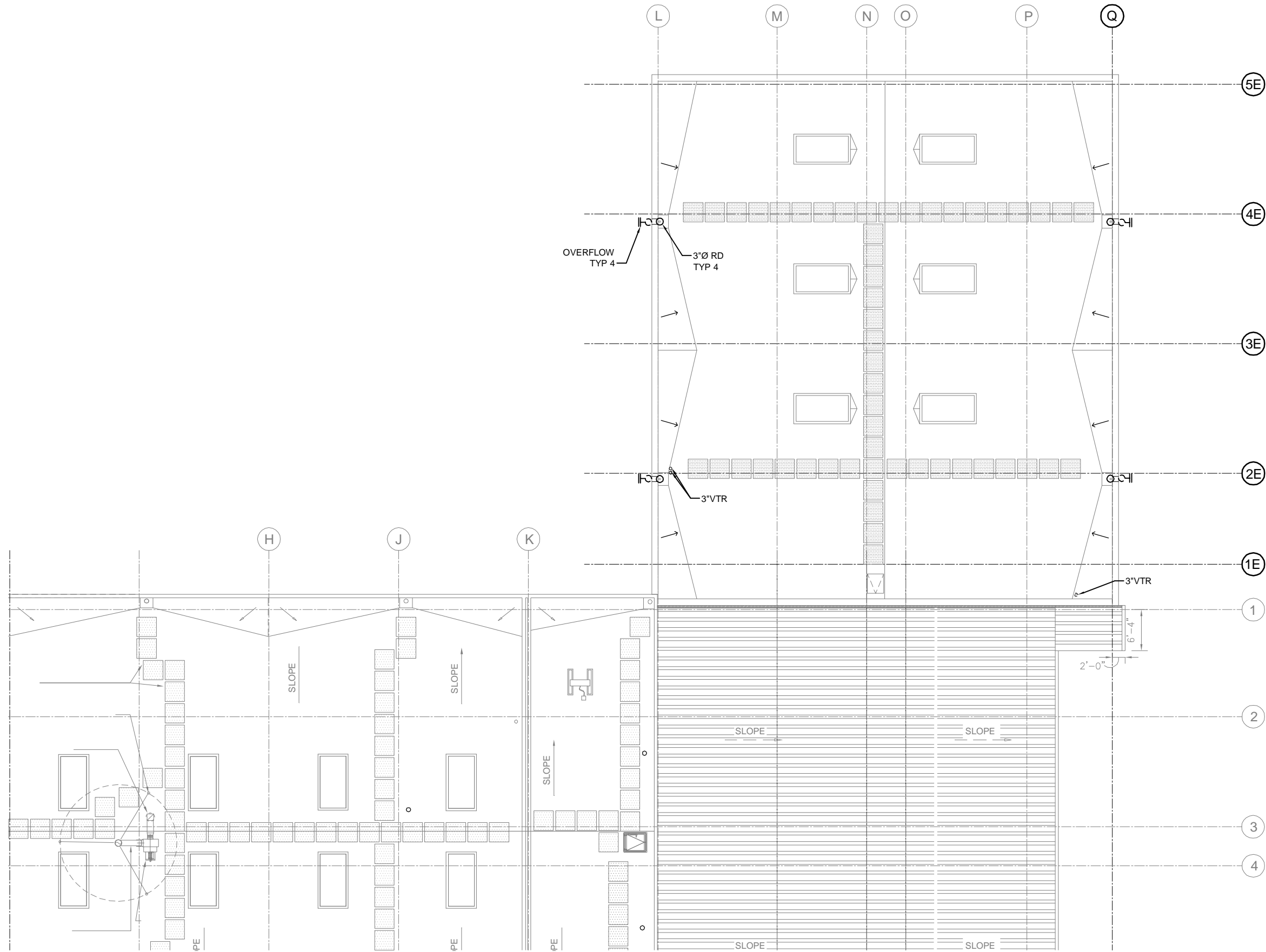
**CITY/BOROUGH OF JUNEAU**  
 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

MECHANICAL  
 SECOND FLOOR  
 PIPING PLAN

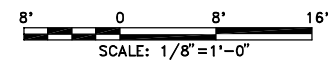
SHEET NO.  
**P1.03**  
 TOTAL SHEETS  
 42 - 72

Path: S:\Active\3010019 - CBU PW Facility\Mechanical\CBU PW-106-007.dwg Plot date: May 21, 2010 04:50:42pm CAD User: vince.villa  
 Xref Filename: | CBUPW-01d-125 Scale | CBUPW-CO-Grid | CBUPW-TB-STE | CBU-MIN |

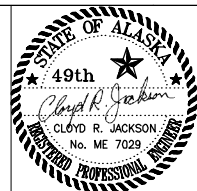


ROOF PIPING PLAN

SCALE: 1/8" = 1'-0"



ONE INCH AT FULL  
 SIZE  
 1"  
 IF NOT ONE INCH,  
 SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

**Tt TETRA TECH**  
 www.tetrattech.com  
 230 South Franklin, Suite 212  
 Juneau, Alaska 99801  
 Phone: 907-586-6400 Fax: 907-463-3677

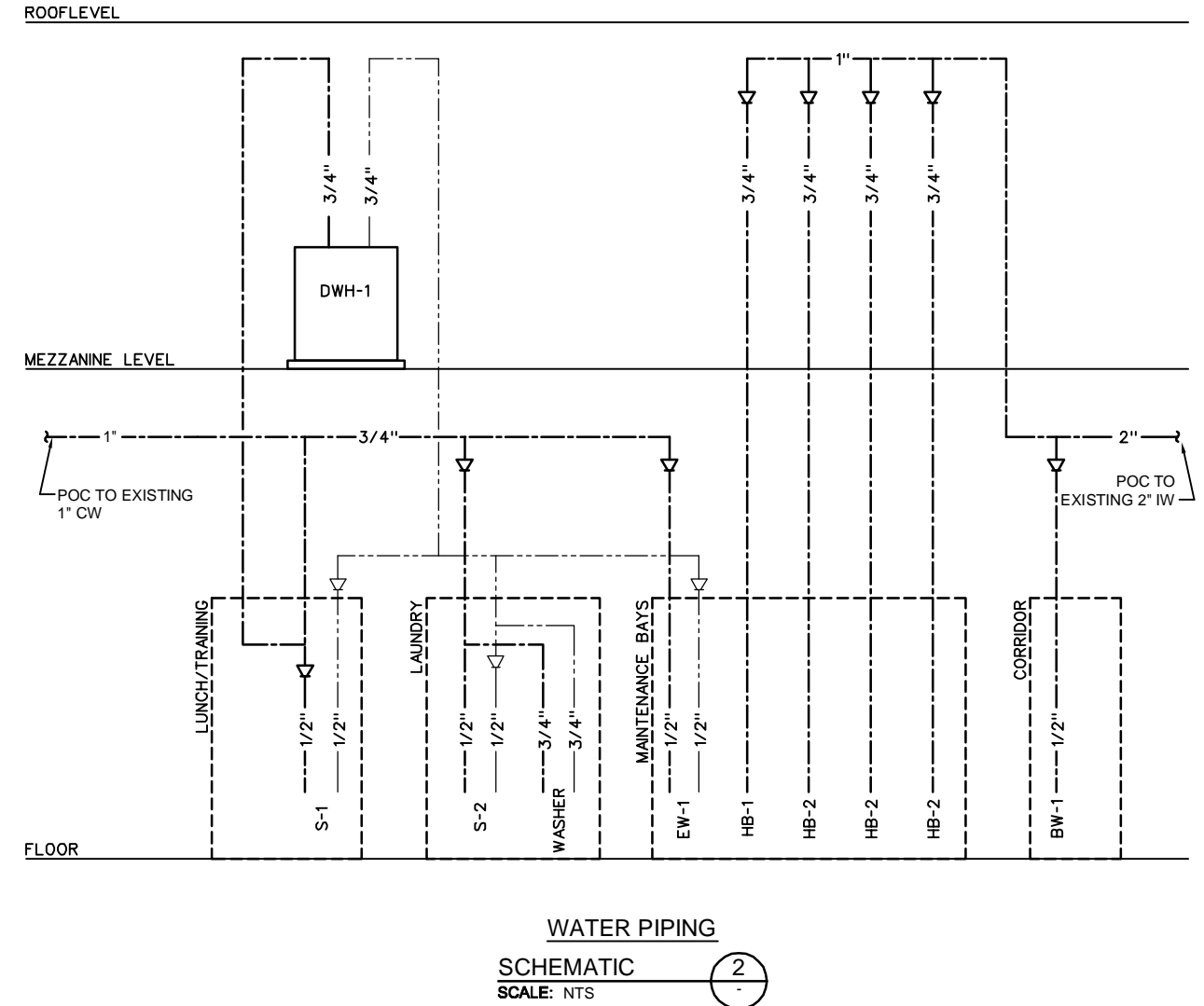
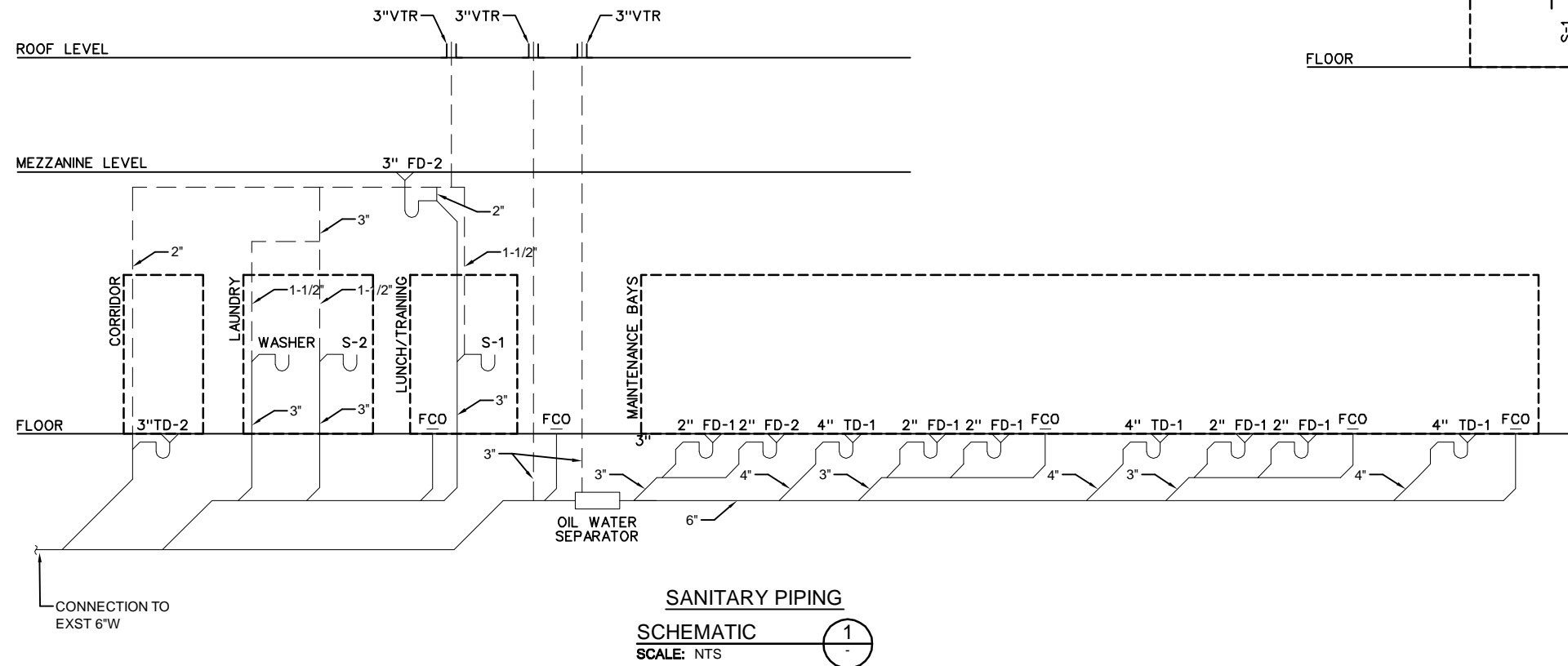
**CITY/BOROUGH OF JUNEAU**  
 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

CONSOLIDATED PUBLIC  
 WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

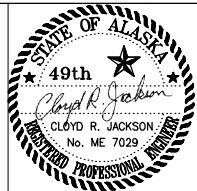
MECHANICAL  
 ROOF  
 PIPING PLAN

SHEET NO.  
**P1.04**  
 TOTAL SHEETS  
 43 - 72

Path: S:\Active\3010019 - CBU PW Facility Mechanical\CBU\_03\201-Schematic.dwg Plot Date: May 21, 2010 04:00:24pm CAD User: vince.wife.  
 Xref Filename: | CPW2\_TB STE | Geo-MIN |



ONE INCH AT FULL SIZE  
 1"  
 IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

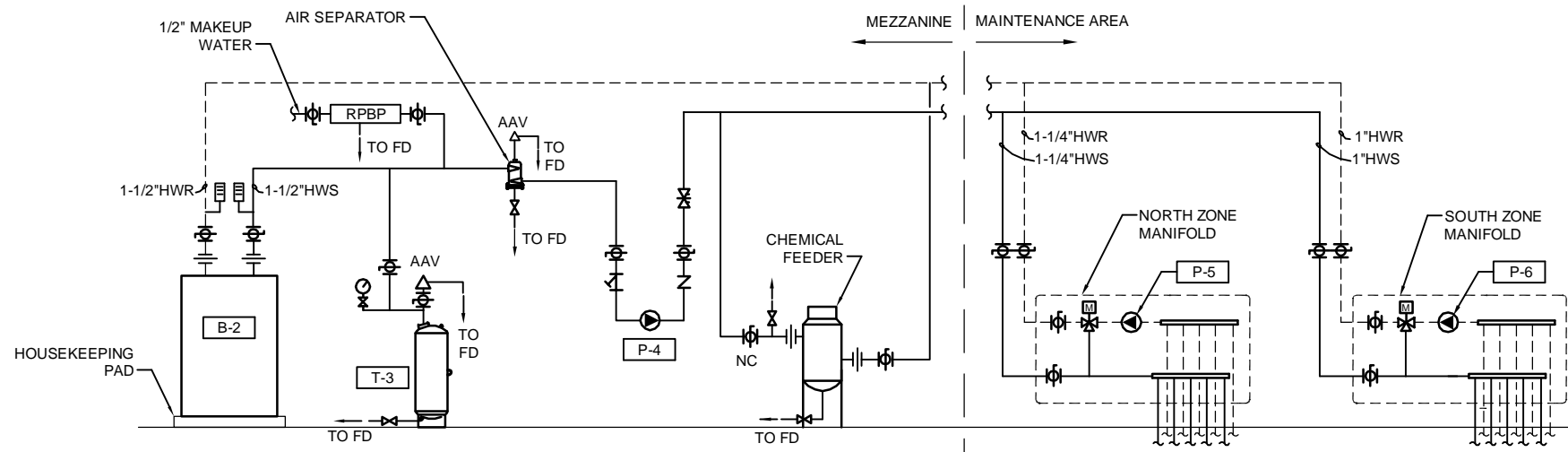
**Tt TETRA TECH**  
 www.tetrattech.com  
 230 South Franklin, Suite 212  
 Juneau, Alaska 99801  
 Phone: 907-586-6400 Fax: 907-463-3677

**CITY/BOROUGH OF JUNEAU**  
 ALASKA'S CAPITAL CITY  
**DEPARTMENT OF ENGINEERING**

CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

MECHANICAL PIPING SCHEMATICS

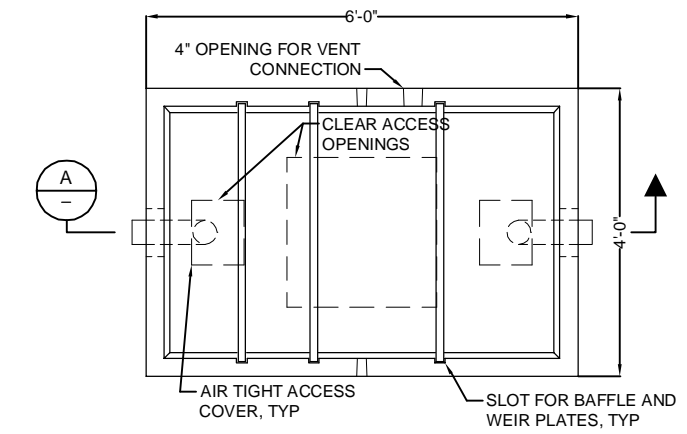
SHEET NO. P2.01  
 TOTAL SHEETS 44 - 72



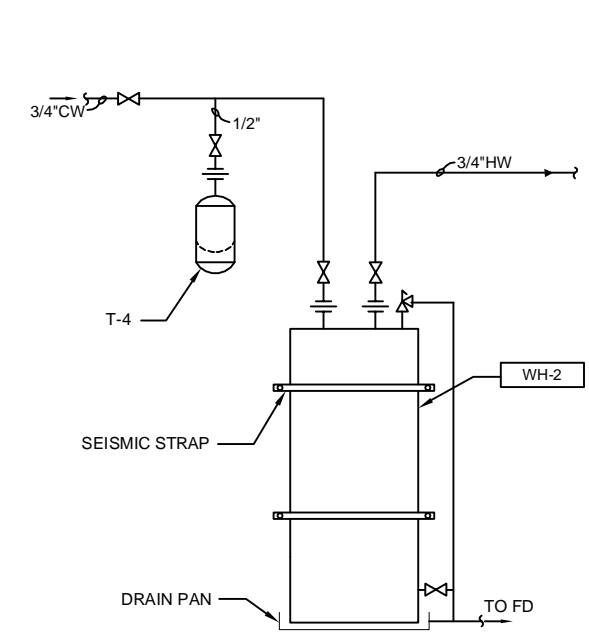
**RADIANT HEATING  
WATER PIPING**  
SCHEMATIC  
SCALE: NTS

- ① SLAB TEMPERATURE SENSOR IN NORTH ZONE
- ② SLAB TEMPERATURE SENSOR IN SOUTH ZONE

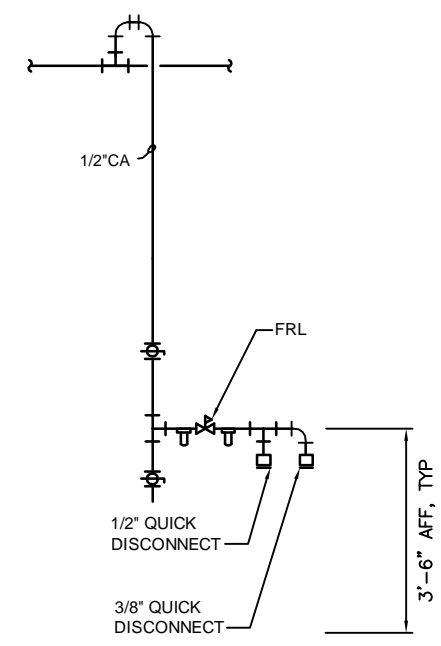
- NOTES:**
1. SEE PLAN DWGS FOR VENT PIPING CONNECTION AND ROUTING.
  2. PROVIDE AIR TIGHT COVERS AND REQUIRED HARDWARE FOR INDOOR INSTALLATION.
  3. TOP AND ACCESS PANEL SHALL HAVE H20 VEHICLE LOADING CAPABILITY.



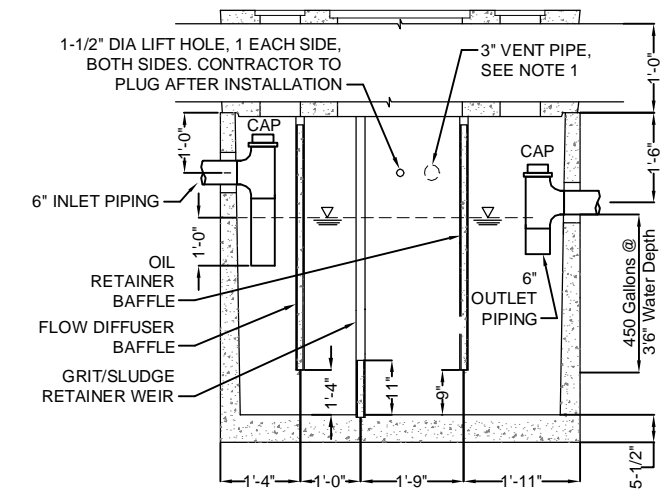
**OIL WATER SEPARATOR**  
DETAIL  
SCALE: NTS



**POTABLE WATER  
HEATER PIPING**  
DETAIL  
SCALE: NTS

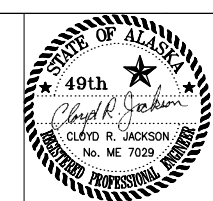


**CA STATIONS**  
DETAIL  
SCALE: NTS

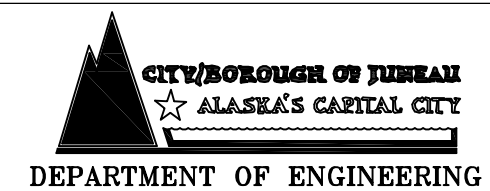


**OIL WATER SEPARATOR**  
SECTION  
SCALE: NTS

ONE INCH AT FULL  
SIZE  
1"  
IF NOT ONE INCH,  
SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010

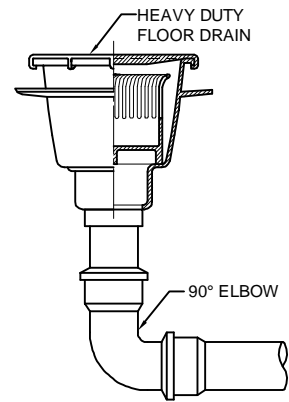


CONSOLIDATED PUBLIC  
WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

MECHANICAL  
PIPING  
DETAILS

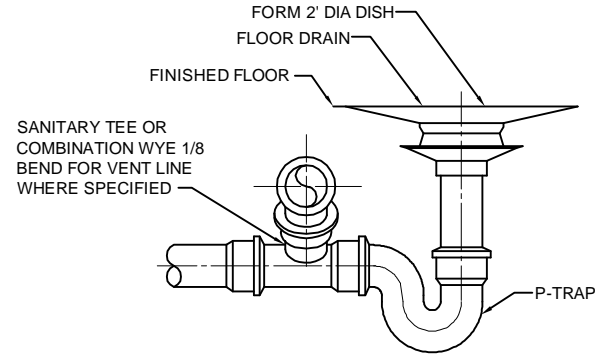
SHEET NO.  
**P5.01**  
TOTAL SHEETS  
45 - 72

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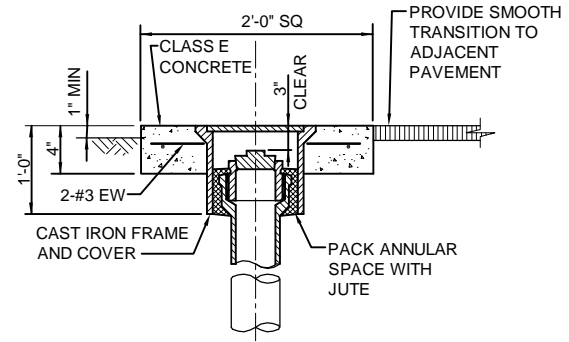
**HEAVY DUTY FLOOR DRAIN (FD-1)**

DETAIL SCALE: NTS 1 TYP



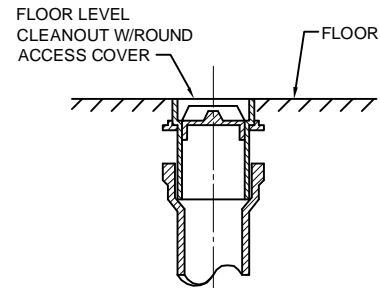
**FLOOR DRAIN (FD-2)**

DETAIL SCALE: NTS 2 TYP



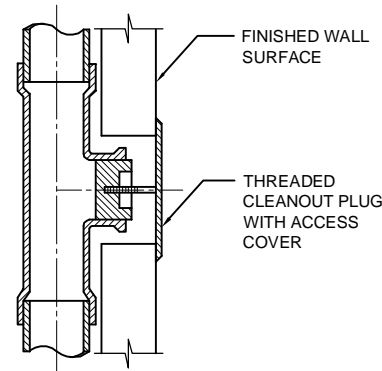
**YARD CLEANOUT**

DETAIL SCALE: NTS 3 TYP



**FLOOR CLEANOUT**

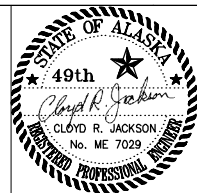
DETAIL SCALE: NTS 4 TYP



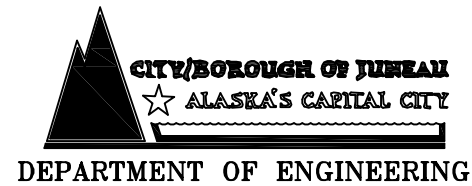
**WALL CLEANOUT**

DETAIL SCALE: NTS 5 TYP

ONE INCH AT FULL SIZE  
1"  
IF NOT ONE INCH, SCALE ACCORDINGLY



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CONSOLIDATED PUBLIC WORKS FACILITY  
STREETS WING ADDITION,  
E10-273

MECHANICAL  
PIPING DETAILS

SHEET NO.  
**P5.02**  
TOTAL SHEETS  
46 - 72

PLUMBING FIXTURE SCHEDULE									
FIXTURE NO.	DESCRIPTION	MODEL	FLUSH VALVE	TRIM	CONNECTION SIZES				REMARKS
					CW	HW	TRAP & DRAIN	VENT	
S-1	KITCHEN SINK	KOHLER K-3346-3	-	KOHLER 15171-FL	3/8"	3/8"	1-1/2"	1-1/2"	-
S-2	SERVICE SINK	KOHLER K-6714	-	K-8905	1/2"	1/2"	3"	3"	PROVIDE 3-INCH IRON PIPE TRAP FOR SERVICE SINK
HB-1	HOSE BIBB	ZURN Z1300	-	-	3/4"	-	-	-	NON-FREEZE IN-WALL HYDRANT
HB-2	HOSE BIBB	ZURN 195 SERIES	-	-	3/4"	-	-	-	-
FD-1	FLOOR DRAIN	JOSAM 37840	-	-	-	-	4"	-	16"X16" HEAVY DUTY DRAIN WITH SLOTTED GRATE
FD-2	FLOOR DRAIN	ZURN ZS400B	-	-	-	-	3"	1-1/2"	ROUND WITH SLOTTED OPENINGS
TD-1	TRENCH DRAIN	ZURN Z886	-	-	-	-	4"	1-1/2"	-
TD-2	TRENCH DRAIN	ZURN Z886	-	K-973 SHOWER HEAD	1/2"	-	3"	1-1/2"	BOOT WASH WITH 6" HAND HELD SHOWER HEAD
EW-1	EYE WASH	GUARDIAN G1814	-	-	1/2"	1/2"	-	-	PROVIDE GUARDIAN G3600 THERMOSTATIC MIXING VALVE
BW-1	BOOT WASH	SYMMONS 1-25-FSB	-	-	1/2"	1/2"	-	-	-

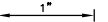
ELECTRIC POTABLE WATER HEATER SCHEDULE									
SYMBOL	LOCATION	INPUT CAPACITY (KW)	STORAGE (GAL)	RECOVERY RATE (GPH)/ TEMP. RISE (°F)	TEMPERATURE RISE (°F)	VOLT-P-HZ	FLA	SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)	SHIPPING WEIGHT (LBS)
WH-2	STREET WING MEZZANINE	1.5	30	2190	90	120-1-60	-	BRADFORD WHITE M-2-30R6DS	85

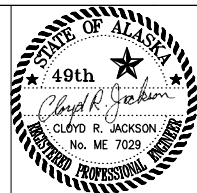
ELECTRIC BOILER SCHEDULE									
SYMBOL	LOCATION	INPUT CAPACITY (KW)	OUTLET WATER TEMP (°F)	ELEMENTS			VOLT-P-HZ	SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)	SHIPPING WEIGHT (LBS)
				QTY	KW	STEPS@KW			
B-2	STREET WING MEZZANINE	54	140	3	18	1@18, 1@36	480-3-60	LOCHINVAR BW 1-054C	600

PUMP SCHEDULE										
SYMBOL	LOCATION	TYPE	SERVICE	FLOW (GPM)	TDH (FT H <sub>2</sub> O)	MOTOR			SELECTION BASED ON MFR/MODEL	REMARKS
						HP	RPM	VOLT-P-HZ		
P-4	STREET WING MEZZANINE	INLINE	BOILER	24	15	0.33	1750	115-1-60	BELL & GOSSETT 60 1-1/2x5-1/4	-
P-5	ZONE 1 MANIFOLD	INLINE	RADIANT FLOOR	13	33	0.25	1750	115-1-60	GRUNDFOS	-
P-6	ZONE 2 MANIFOLD	INLINE	RADIANT FLOOR	7	35	0.25	1750	115-1-60	GRUNDFOS	-

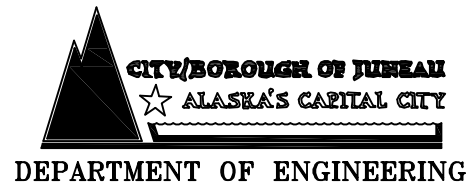
RADIANT FLOOR HEATING SCHEDULE								
SYMBOL	TYPE	ZONE	MIN OUTPUT (BTUH)	NO OF LOOPS	FLOW RATE (GPM)	HEAD LOSS (FT. H <sub>2</sub> O)	SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)	REMARKS
-	MANIFOLD	1	107000	6	12.9	33.1	HEATLINK	-
-	MANIFOLD	2	55000	3	6.6	35.4	HEATLINK	-

TANK SCHEDULE								
SYMBOL	LOCATION	SERVICE	TYPE	DIAMETER (IN)	LENGTH (IN)	TANK VOLUME (GAL)	WEIGHT (LBS)	SELECTION BASED ON MANUFACTURER/MODEL (OR APPROVED EQUAL)
T-3	STREET WING MEZZANINE	RADIANT HEATING	EXPANSION TANK	16	34	22	270	BELL AND GOSSETT B-85LA
T-4	STREET WING MEZZANINE	DOMESTIC WATER HEATING	EXPANSION TANK	10	10-3/8	2	21	BELL AND GOSSETT PTA-5

ONE INCH AT FULL SIZE  
  
 IF NOT ONE INCH, SCALE ACCORDINGLY



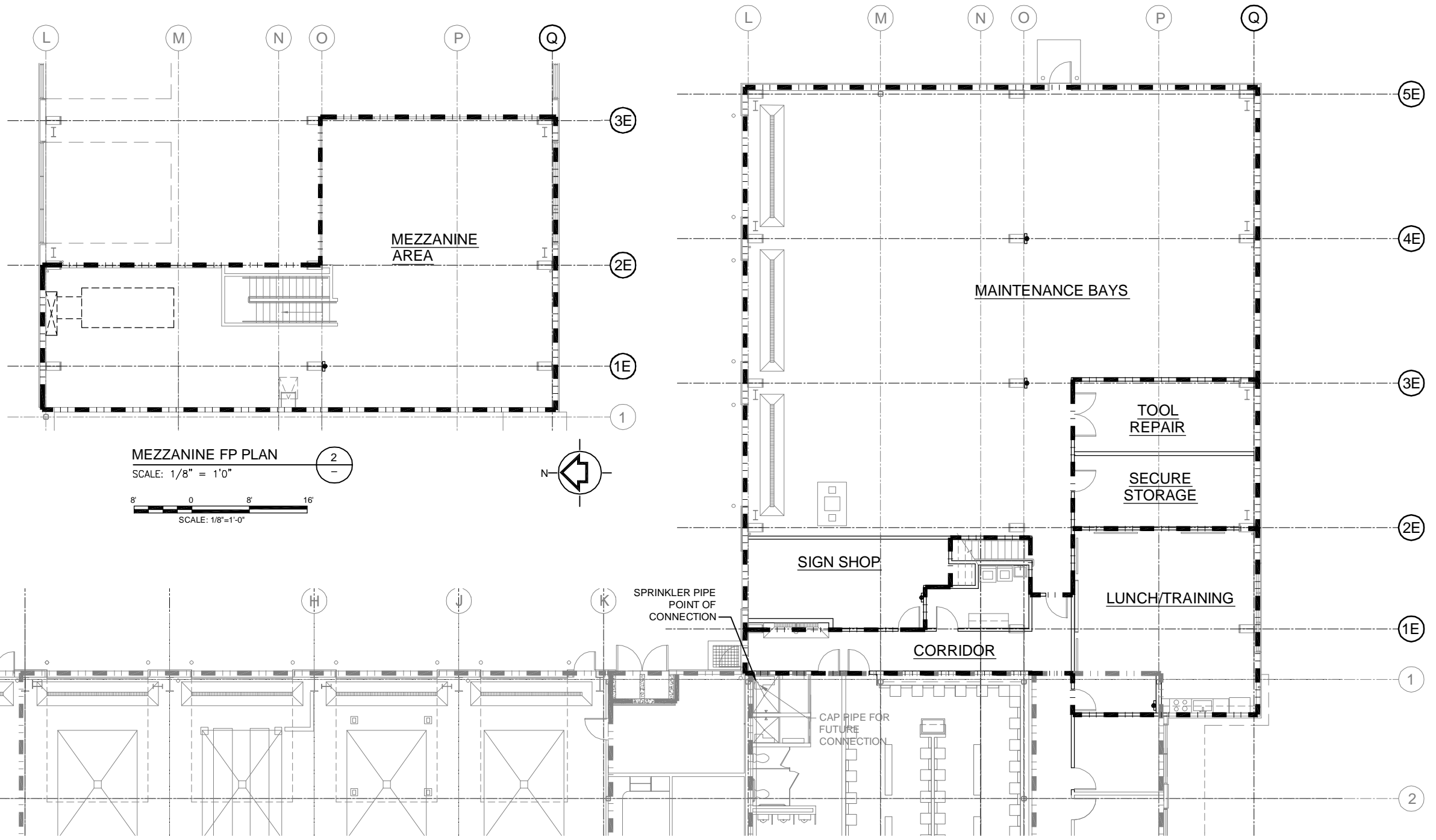
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CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

MECHANICAL  
 PLUMBING EQUIPMENT  
 SCHEDULES

SHEET NO.  
**P6.01**  
 TOTAL SHEETS  
 47 - 72



**NOTES:**

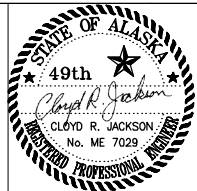
1. SPRINKLER SYSTEM SHALL BE DESIGNED BY LICENSED FIRE PROTECTION ENGINEER.
2. SPRINKLER DESIGN AND INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 13 AND APPROVED BY CITY/BOROUGH OF JUNEAU FIRE DEPARTMENT.

**MEZZANINE FP PLAN**  
 SCALE: 1/8" = 1'-0"  
 2

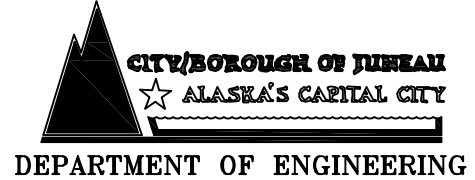
**FIRST FLOOR FP PLAN**  
 SCALE: 1/8" = 1'-0"  
 1

FIRE SPRINKLER ZONE		
ZONE	CLASSIFICATION	DENSITY
MAINTENANCE BAYS/ SIGN SHOP	ORDINARY HAZARD GROUP 2	0.25 GPM/SF PER FM GLOBAL STANDARDS
LUNCH/TRAINING/ CORRIDOR	LIGHT HAZARD	0.10 GPM/SF OR PER NFPA 13
TOOL REPAIR/ SECURE STORAGE	ORDINARY HAZARD GROUP 2	0.20 GPM/SF OR PER NFPA 13
MEZZANINE	ORDINARY HAZARD GROUP 2	0.20 GPM/SF OR PER NFPA 13

ONE INCH AT FULL SIZE  
 1"  
 IF NOT ONE INCH, SCALE ACCORDINGLY



DRAWN BY: DS    DESIGNED BY: DS    CHECKED BY: CRJ    DATE: MAY 2010



CONSOLIDATED PUBLIC WORKS FACILITY  
 STREETS WING ADDITION,  
 E10-273

FIRE PROTECTION PLAN

SHEET NO. FP1.01  
 TOTAL SHEETS 48 - 72

Path: S:\Active\_3010019 - CBU PW Facility Mechanical\CBU CO\FP1.01.dwg Plot date: May 21, 2010 - 03:55:41pm CAD User: vince.wila.  
 Xref Filename: | CBU-PW-Grid | CBU-PW-CO BuildingWorking-First flr | CBU-PW CO-Grid | CBU-PW-CO BuildingWorking-second flr | CBU-PW-TB STE | Cap-MIN |