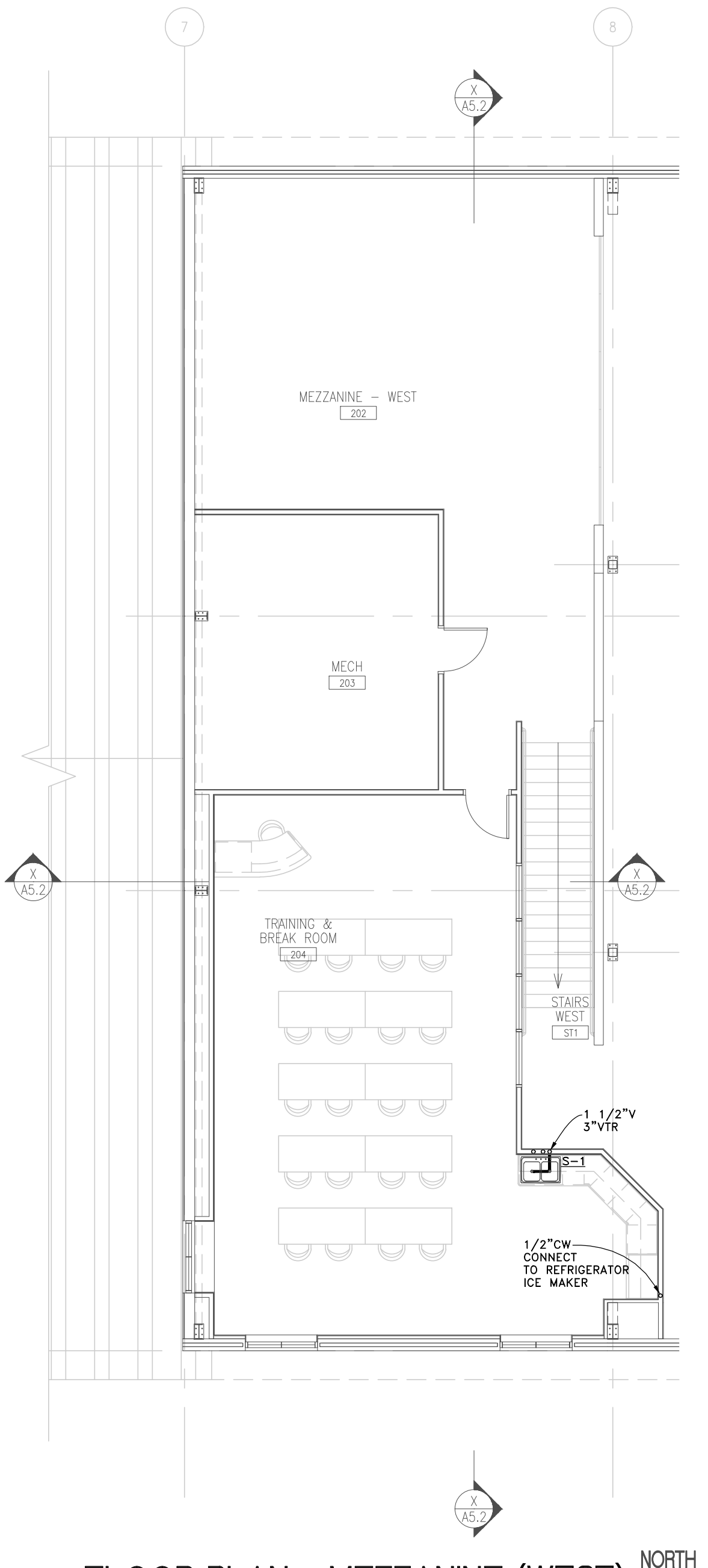


FLOOR PLAN - OFFICE
 SCALE: 1/8" = 1'-0" FIRST FLOOR SQ.FT. = 7,405
 TOTAL SQ.FT. = 26,490



FLOOR PLAN - MEZZANINE (WEST)
 SCALE: 1/8" = 1'-0" MEZZANINE (WEST) SQ.FT. = 2,345
 TOTAL SQ.FT. = 26,490

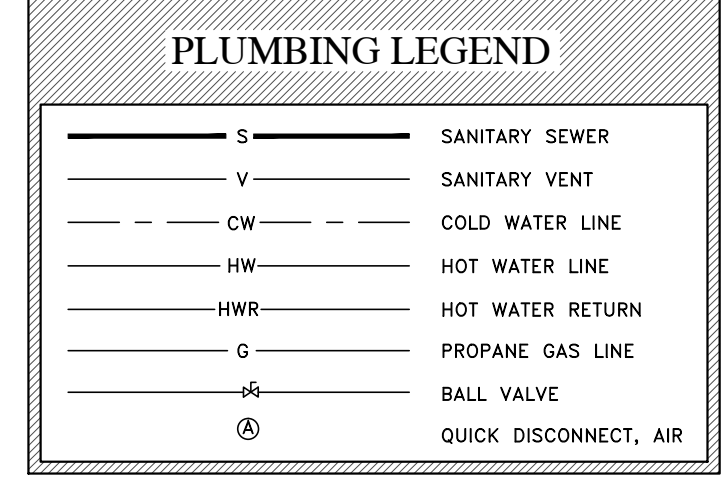
PLUMBING NOTES

- | | | |
|--|---|--|
| <p>GENERAL NOTES</p> <ol style="list-style-type: none"> ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS. EACH CONTRACTOR SHALL BE THOROUGHLY KNOWLEDGEABLE OF REGULATIONS GOVERNING HIS PRODUCT AND SERVICE AND SHALL ASSUME RESPONSIBILITY OF INSTALLATION IN ACCORDANCE WITH THOSE REGULATIONS. CONTRACTORS TO VERIFY ALL DIMENSIONS RELATIVE TO THEIR SPECIFIC WORK AND SHALL BE THOROUGHLY FAMILIAR WITH EXISTING CONDITIONS PRIOR TO INITIATING THEIR WORK. DISCREPANCIES SHALL BE REPORTED TO THE GENERAL CONTRACTOR OR TO HIS ON-SITE REPRESENTATIVE. FAILURE TO DETECT INFERIOR WORK, OR WORK NOT IN ACCORDANCE WITH THESE CONSTRUCTION DOCUMENTS, SHALL NOT BE CONSTRUED AS ACCEPTABLE OF SUCH WORK. ANY PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES FOR MECHANICAL OR PLUMBING SYSTEMS, ETC. SHALL BE FIRE-STOPPED AND DRAFT-STOPPED WITH NON-COMBUSTIBLE MATERIALS PER CODE REQUIREMENTS TO MAINTAIN STRUCTURAL AND FIRE RESISTIVE INTEGRITY. DRAWINGS ARE DIAGRAMMATIC ONLY. FIELD VERIFY EXISTING CONDITIONS. PRIOR TO SUBMITTING A PROPOSAL, BIDDER SHALL HAVE VISITED THE CONSTRUCTION SITE. HE SHALL BE FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH HE WILL HAVE TO OPERATE AND WHICH WILL IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT. NO SUBSEQUENT ALLOWANCE WILL BE MADE IN THIS CONNECTION ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OF NEGLIGENCE ON HIS PART. | <p>PLUMBING CONSTRUCTION NOTES</p> <ol style="list-style-type: none"> PLUMBING CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL FEES, INCLUDING COSTS ASSESSED BY THE MECHANICAL UTILITY COMPANIES, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. AT THE COMPLETION OF PLUMBING WORK, THE PLUMBING CONTRACTOR SHALL FURNISH THE OWNER WITH ALL CERTIFICATES OF FINAL INSPECTION AND APPROVALS. PLUMBING CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED UNDER HIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER. SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AT NO EXPENSE TO THE OWNER. PLUMBING CONTRACTOR SHALL COORDINATE LOCATIONS OF HIS EQUIPMENT AND WORK WITH OTHER BUILDING TRADES TO AVOID ANY INTERFERENCE BETWEEN HIS WORK AND OTHER BUILDING TRADES. IF ANY DISCREPANCIES OCCUR, CONSULT WITH THE GENERAL CONTRACTOR OR HIS ON-SITE REPRESENTATIVE. THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR THE PROPER RESTORATION OF ALL EXISTING SURFACES REQUIRING PATCHING, PLASTERING, PAINTING AND/OR OTHER REPAIR DUE TO THE INSTALLATION OF MECHANICAL WORK UNDER THE TERMS OF THIS SPECIFICATION. CLOSE ALL OPENINGS, REPAIR ALL SURFACES, ETC. AS REQUIRED. THE CONTRACTOR SHALL EMPLOY QUALIFIED AND EXPERIENCED WORKMEN FOR THIS WORK. THE PLUMBING CONTRACTOR SHALL PERIODICALLY REMOVE FROM THE SITE ALL DEBRIS AND RUBBISH ACCUMULATING AS A RESULT OF THE MECHANICAL INSTALLATION. UPON COMPLETION OF THE PROJECT, HE SHALL DISPOSE OF ALL DEBRIS AND RUBBISH AND SHALL LEAVE ALL AREAS CLEAN. | <p>GENERAL</p> <ol style="list-style-type: none"> REFERENCE ARCHITECTURAL DRAWINGS FOR ALL ROUGH-IN DIMENSIONS, BOTH FIXTURES AND WALLS. ALL VALVES SHALL BE ACCESSIBLE. WATER HAMMER ARRESTORS SHALL BE INSTALLED AND SHALL BE ACCESSIBLE. PLUMBING CONTRACTOR TO EXTEND WATER AND SANITARY LINES AND MAKE UTILITY CONNECTIONS. CONNECT A 1/2" CW LINE TO FRIDGE ICE MAKER; PROVIDE A SHUT-OFF VALVE IN CW LINE TO FRIDGE. COORDINATE WITH OWNER'S EXT'G FRIDGES THAT ARE TO BE RELOCATED. <p>SPECIFICATIONS</p> <ol style="list-style-type: none"> PLUMBING DESIGN PER 2009 MICHIGAN PLUMBING CODES. PIPING SPECIFICATIONS HOT AND COLD WATER PIPING SHALL BE INSULATED WITH 1" FIBERGLASS, EQUAL TO OWENS CORNING AS/SSL-11, ASTM C547. SANITARY SEWER PIPING ABOVE OR BELOW GRADE TO BE PVC, ASTM D266.5, WITH ASTM D2855 JOINTS. WATER PIPING ABOVE GRADE TO BE TYPE L HARD DRAWN. WATER PIPING BELOW GRADE TO BE TYPE K ANNEALED TEMPER. NATURAL GAS PIPING TO BE BLACK STEEL, SCHEDULE 40, ASTM A53, OR A120. ALL PIPING SHALL BE CLEANED AND TESTED PER APPLICABLE AWWA, BOCA, AND AGA STANDARDS. |
|--|---|--|

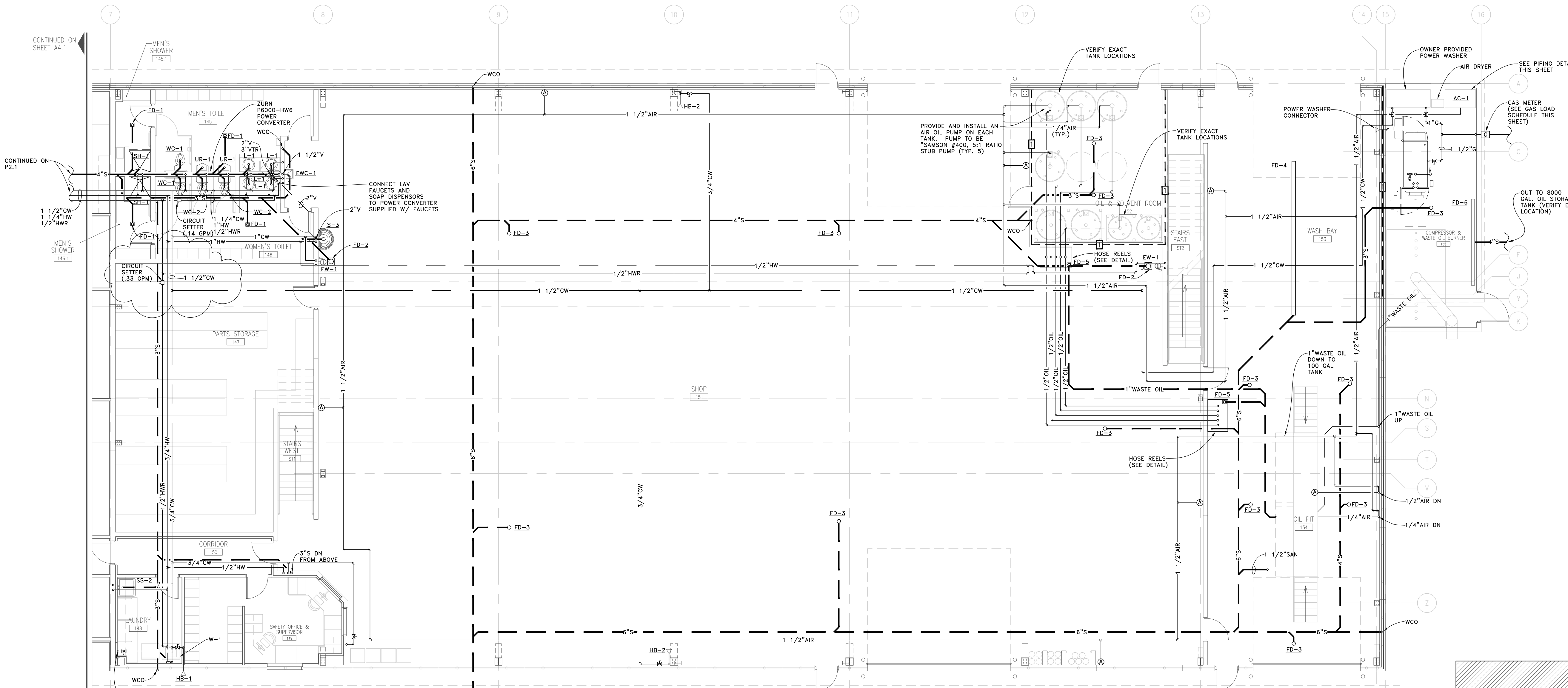
PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	MANU.	MODEL	SAN.	HOT	COLD	REMARKS
WC-1	WATER CLOSET	AM. STD.	2467.100	3"	-	1"	W/ OLSONITE #95 SEATE, 17" HIGH
WC-1	WATER CLOSET	AM. STD.	2462.100	3"	-	1"	W/ OLSONITE #95 SEATE, 15" HIGH
UR-1	URINAL	ZURN	Z5738.206	3"	-	3/4"	URINAL W/ HARD-WIRED FLUSH VALVE, CONNECT TO ZURN P6000-HWE
L-1	LAVATORY	AM. STD.	Q419.444	1 1/2"	1/2"	1/2"	W/ AM. STD. 6059.105 FAUCET, SEE NOTES #4 #5 & #7
EW-1	ELECTRIC WATER COOLER	ELKAY	E24	1 1/2"	-	1/2"	SINGLE UNIT AT ADA HEIGHT
S-1	SINK	ELKAY	DLR3319	1 1/2"	1/2"	1/2"	W/ ELKAY LKD2223 FAUCET
S-2	SINK	ELKAY	BLR-150C	1 1/2"	1/2"	1/2"	COMBINATION INCLUDES SINK AND FAUCET
WF-1	WASH FOUNTAIN	BRADLEY	SN2003-B-AST4-F-STD-TMA-LSO-BS	2"	3/4"	3/4"	36" SEMI CIRCULAR WASH FOUNTAIN, W/ FOOT CONTROLS
SS-1	SERVICE SINK	FLORESTONE	MSR-2424	1 1/2"	1/2"	1/2"	W/ MR-370 & MR-371
SS-2	SERVICE SINK	FLORESTONE	FM	1 1/2"	1/2"	1/2"	W/ MR-370 & MR-371
EW-1	EYE WASH	BRADLEY	S19214B-0-2-A-G-0-A-R	1 1/2"	1/2"	1/2"	EYE WASH WITH MIXING VALVE
HB-1	HOSE BIB	WOODFORD	MODEL 65	-	-	3/4"	FREEZELESS, WITH VACUUM BREAKER
HB-2	HOSE BIB	WOODFORD	MODEL 17	-	-	3/4"	-
FD-1	FLOOD DRAIN	ZURN	ZN-415-5S	3"S	-	-	W/ TYPE 'S' SQUARE STRAINER, NICKEL BRONZE TOP, SEE NOTE #6
FD-2	FLOOD DRAIN	ZURN	ZN-415-5B	3"S	-	-	W/ TYPE 'B' ROUND STRAINER, NICKEL BRONZE TOP, SEE NOTE #6
FD-3	FLOOD DRAIN	ZURN	Z-516	4"S	-	-	EXTRA HEAVY DUTY DRAIN, SEE NOTE #6
FD-4	FLOOD DRAIN	ZURN	Z886-DGE-H2E1-CUT	4"S	-	-	EXTRA HEAVY DUTY TRENCH DRAIN, 21' LONG
FD-5	FLOOD DRAIN	ZURN	Z1950-6	3"S	-	-	FLOOR SINK WITH 6" FUNNEL
FD-6	FLOOD DRAIN	ZURN	Z886-DGE-H2E1-CUT	3"S	-	-	EXTRA HEAVY DUTY TRENCH DRAIN, 12' LONG
SH-1	SHOWER	AQUA GLASS	313637D	1 1/2"	1/2"	1/2"	W/ DELTA #117285 SHOWER HEAD AND HANDLE
SP-1	SUMP PUMP	HYDROMATIC	118-5	1 1/2"	-	-	COMPLETE SYSTEM W/ BU-A1 PUMP, 120V, 1/4 HP
OI-1	OIL/SOLIDS INTERCEPTOR	GREENTURTLE	OMC-1000	6"	-	-	1000 GALLON TOTAL VOLUME
OP-1	OIL PUMP	WILDEN	PX200/AAAAA/BN/BN/ABN/0687	6"	-	-	SUBMERSIBLE PUMP, W/ FLOATS

- NOTES:**
- SEE ARCHITECTURAL DRAWINGS FOR ALL ROUGH-IN LOCATIONS OF PLUMBING FIXTURES.
 - WC-1 TO CONFORM TO ADA REQUIREMENTS.
 - VERIFY COLOR WITH ARCHITECT BEFORE ORDERING.
 - INSULATE ALL EXPOSED SANITARY AND DOMESTIC HOT AND COLD WATER PIPING TO LAVATORIES.
 - PROVIDE A POWERS 480 MIXING VALVE AT EACH LAV.
 - PROVIDE A 1/2" TRAP PRIMER TO FLOOR DRAIN FROM NEAREST SINK DRAIN.
 - UNIT IS SUPPLIED WITH POWER CONVERTER, CONNECT ALL LAV'S AND SOAP DISPENSERS TO POWER CONVERTER AS INDICATED AND REQ'D.

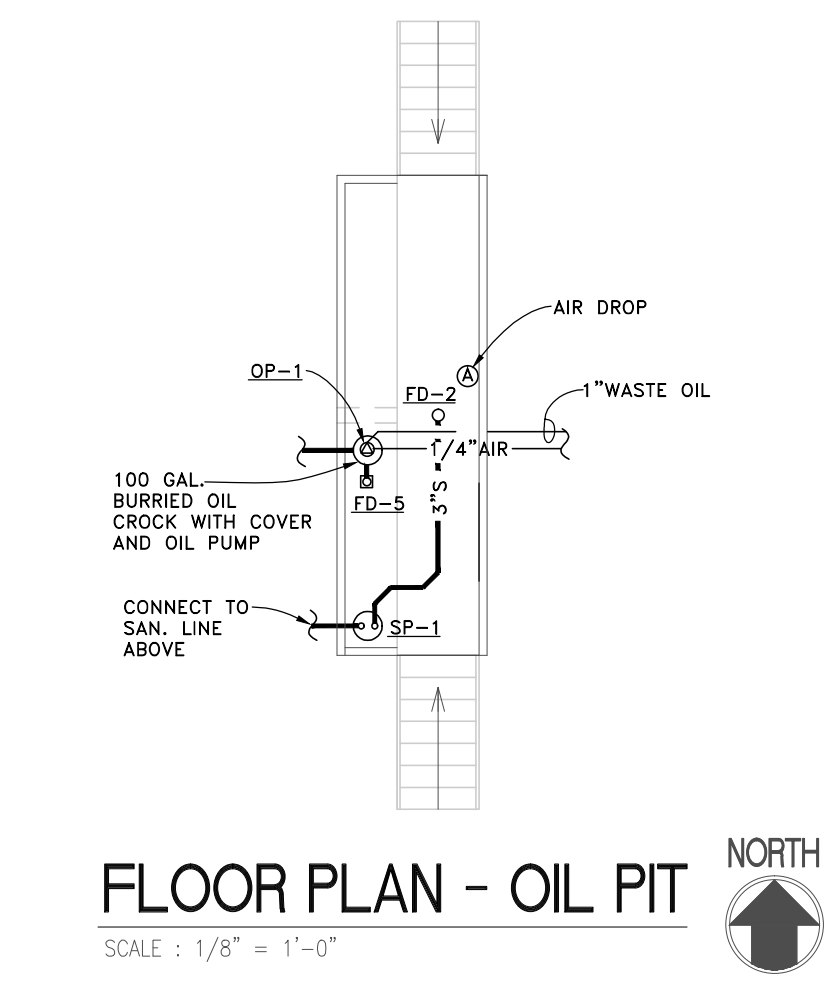


FISHER CONTRACTING
 PROJECT NO. 1104-03
 JOB NUMBER
E11-318



GAS LOAD SCHEDULE

MARK	EQUIPMENT	GAS LOAD
B-1	BOILER	1,000,000 BTU/HR
-	POWER WASHER	100,000 BTU/HR
TOTAL GAS LOAD		1,100,000 BTU/HR



FLOOR PLAN - SHOP (FIRST FLOOR)
 SCALE: 1/8" = 1'-0"
 FIRST FLOOR SQ.FT. - 2,405
 TOTAL SQ.FT. - 26,490

COMPRESSED AIR SYSTEM PIPING

⑤ PIPING FOR THE COMPRESSED AIR SYSTEM SHALL BE INSTALLED WITH STANDARD PRACTICES FOR THAT FUNCTION. PIPING SHALL BE SCREWED STEEL BLACK, SCH 40. TAPS OFF OF MAIN SHALL BE FROM THE TOP OF THE MAIN AND SHALL BE 1/2" UNLESS OTHERWISE REQUIRED. MAIN SHALL HAVE SLOPE BUILT INTO IT TO DRAIN BACK TO SUPPLY. EACH DROP SHALL HAVE AN ISOLATION VALVE AND AN AIR CHUCK. ELEVATION SHALL BE TO OWNERS REQUESTS (IF NOT DIRECTED BY OWNER, ELEVATION SHALL BE 48" AFF). CHUCKS WHICH ARE OVER BENCHES SHALL BE 12" ABOVE BENCH SURFACE. IT IS THE INTENT TO HAVE PIPING PAINTED AT THE SAME TIME THAT WALL ARE BEING PAINTED.

AIR COMPRESSOR (AC-1)

QUINCY 5120 - COMPRESSOR MODEL F5120 SIMPLEX RECIPROCATING AIR COMPRESSOR RATED AT 86.6 ACFM AT 175 PSIG. THE TANK UNIT IS BUILT ON A 200 GALLON TANK AND POWERED BY A 25 HP 460/3Ø/60 ODP, PREMIUM EFFICIENCY MOTOR WITH COMPRESSOR OPERATING AT 351 RMP.
QUINCY QPNC-100 - REFRIGERATED AIR DRYER RATED AT SCFM AT 175 PSIG FULL LOAD DISCHARGE PRESSURE.
QUINCY CSNT00125 - RATED AT SCFM AT 100 PSIG.
QUINCY CPNT00125 - RATED AT SCFM AT 100 PSIG.

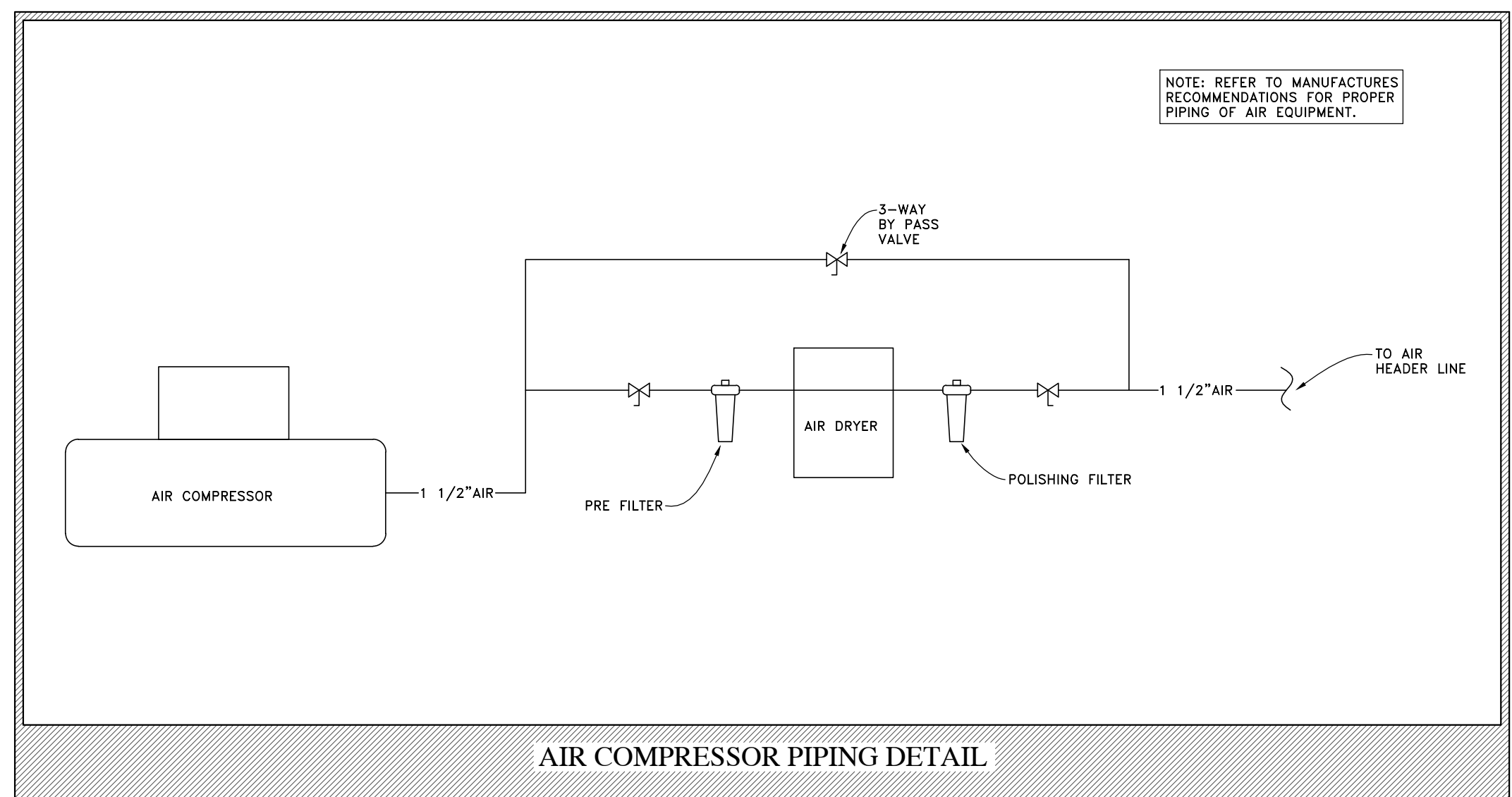
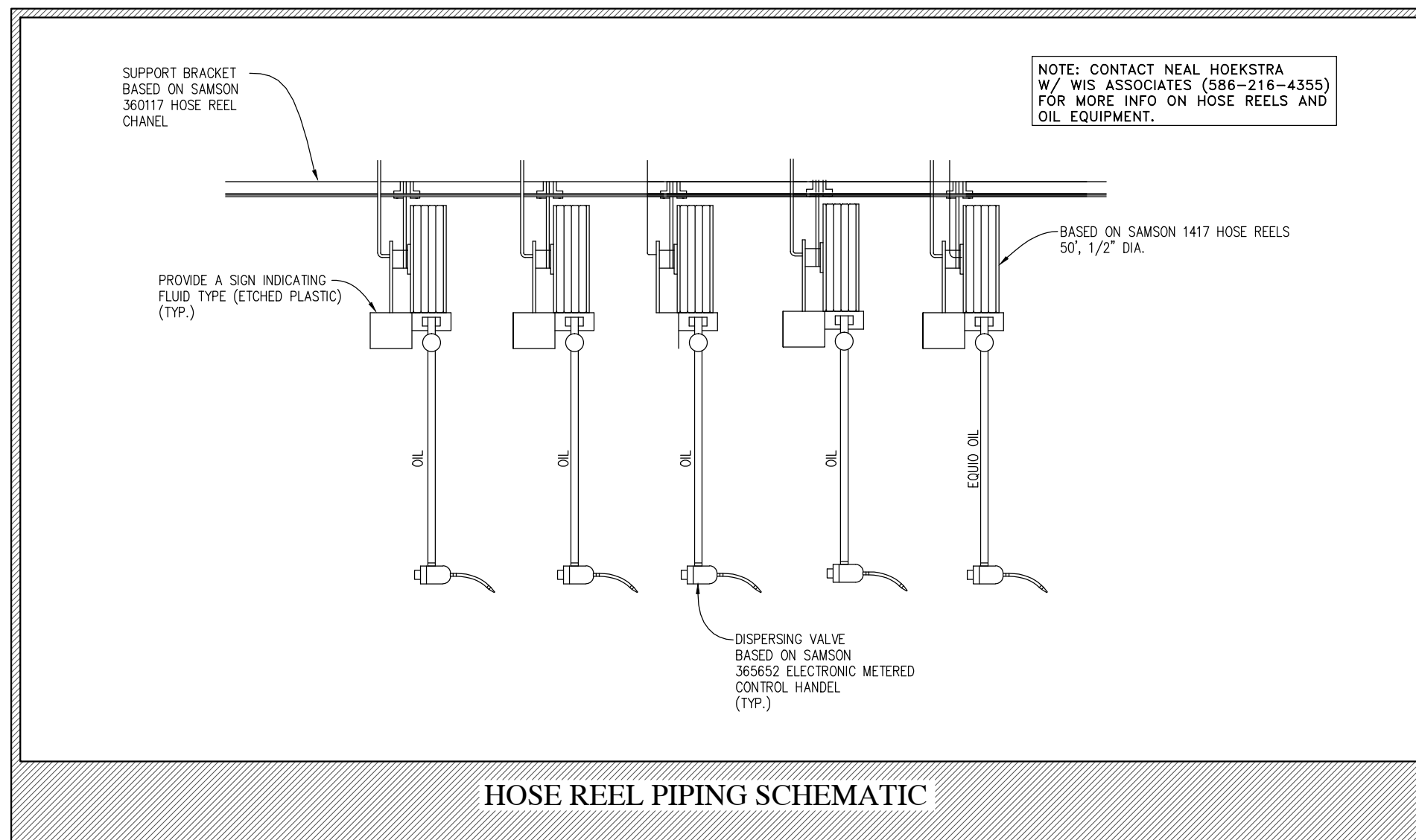
NOTE: CONTACT CHAD TIMMER W/ MICHIGAN AIR SOLUTIONS (586-216-4355) FOR MORE INFO ON THE AIR COMPRESSOR SYSTEM.

Chad Timmer, Sales Engineer Michigan Air Solutions LLC Office 616-531-8940

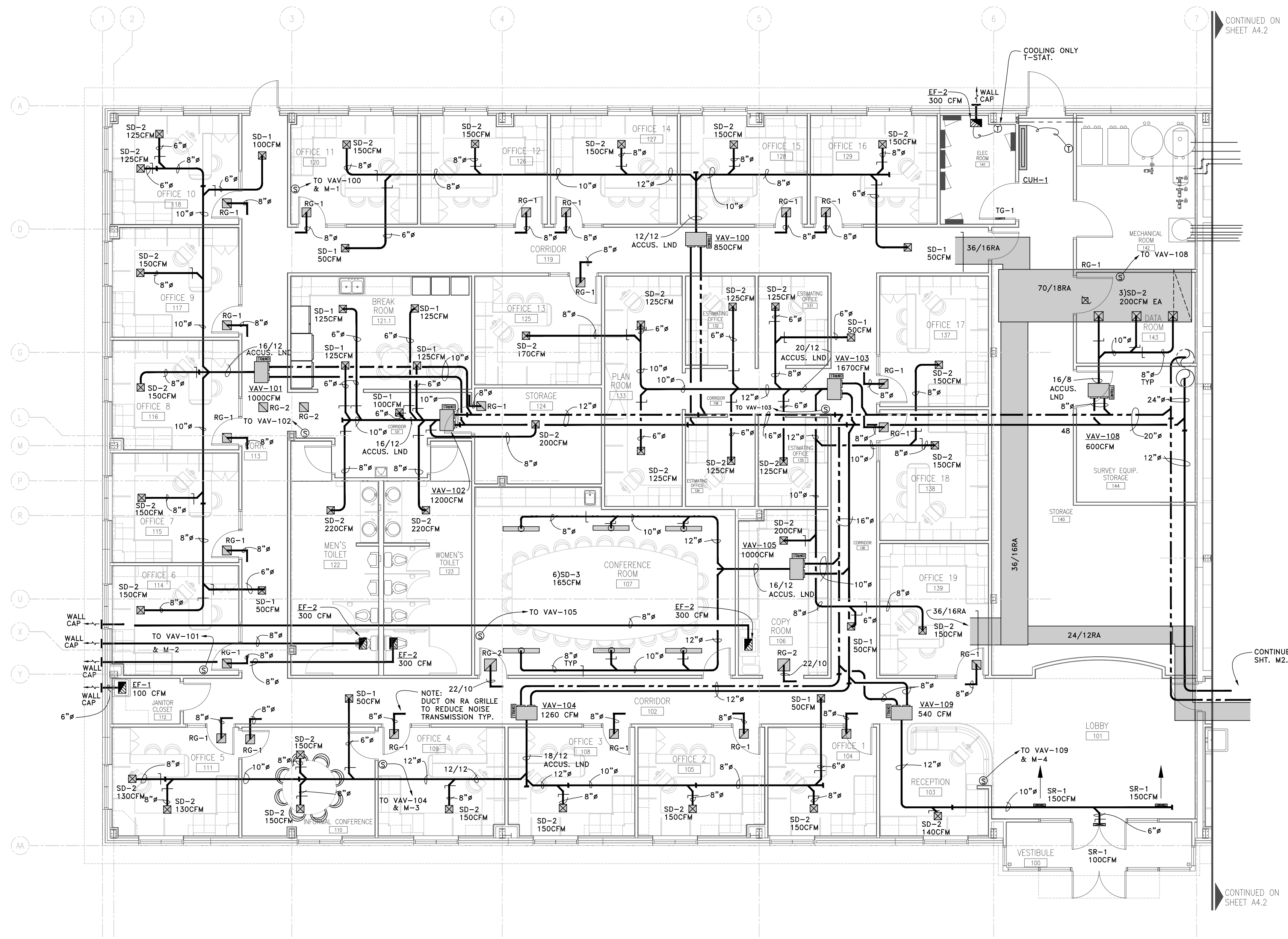
BOILER MATE SCHEDULE

MARK	MODEL No.	VOLUME GAL	SOURCE INLET & OUTLET	SYSTEM OUTLET	SIZE		WEIGHT		REMARKS
					DIA	OAL	DRY	FILLED	
BM-1	SSU-80C	80	1 1/2"NPT	1 1/2"NPT	23.2"	72"	141	812	SEE NOTES

NOTES:
 1. BASED ON SUPER-STOR
 2. THE TANKS ARE TO BE FACTORY JACKETED & INSULATED W/ 1 1/2" HIGH DENSITY INSULATION.



PROJECT: FLOOR PLAN
FISHER CONTRACTING
 3PF
 JOB NUMBER: E11-318



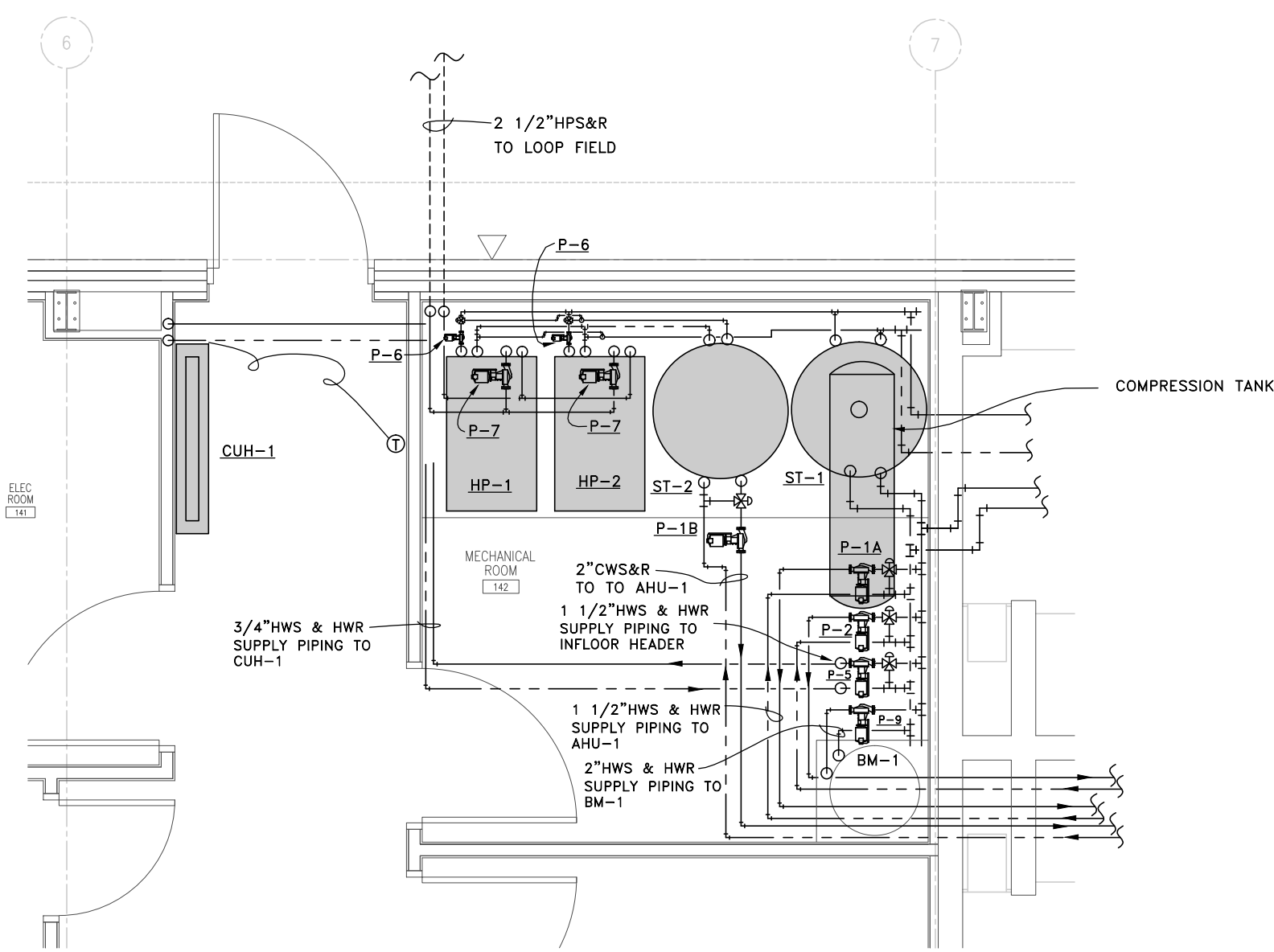
FLOOR PLAN - OFFICE - MECHANICAL

SCALE: 1/8" = 1'-0" FIRST FLOOR SQ.FT. - 7,405
TOTAL SQ.FT. - 26,490



FLOOR PLAN - MEZZANINE (WEST)

SCALE: 1/8" = 1'-0" MEZZANINE (WEST) SQ.FT. - 2,345
TOTAL SQ.FT. - 26,490



FLOOR PLAN - MECH. RM. - MECH.

SCALE: 1/4" = 1'-0"



MECHANICAL LEGEND

AHU	AIR HANDLING UNIT	— — —	GLOBE VALVE
CUH	CABINET UNIT HEATER	— — —	BUTTERFLY VALVE
EF	EXHAUST FAN	— — —	UNION
VAV	VARIABLE AIR VOLUME BOX	— — —	FLOW CONTROL VALVE
RAF	RETURN AIR FAN	— — —	AIR VENT
B	BOILER	— — —	CIRCUIT SETTER
CAU	COMBUSTION AIR UNIT	— — —	STRAINER
HP	HEAT PUMP	— — —	3-WAY VALVE
P	PUMP	— — —	TRIPLE DUTY VALVE
ST	STORAGE TANK	— — —	CHECK VALVE
S.A.	SUPPLY AIR	— — —	PRESSURE RELIEF VALVE
R.A.	RETURN AIR	— — —	CONTROL VALVE
O.A.	OUTDOOR AIR	— — —	PIPE FLOW RATE IN GPM
E.A.	EXHAUST AIR	— — —	1 Hr FIRE DAMPER (SEE NOTE#4)
HWS/HWR	HOT WATER HEATING SUPPLY/RETURN	— — —	2 Hr FIRE DAMPER (SEE NOTE#4)
CWS/CWR	CHILLED WATER COOLING SUPPLY/RETURN	— — —	
HPS/HPR	HEAT PUMP WATER SUPPLY/RETURN	— — —	
S	SENSOR	— — —	
T	THERMOSTAT	— — —	
— — —	THERMOMETER	— — —	
— — —	BALANCE DAMPER W/LOCKING QUADRANT	— — —	
— — —	MOTORIZED DAMPER	— — —	
— — —	PUMP	— — —	
— — —	BALL VALVE	— — —	

GENERAL HVAC NOTES

- REFERENCE WRITTEN SPECIFICATIONS, SECTION 15000.
- MECHANICAL DESIGN PER MICHIGAN MECH. CODE 2009.
- OUTSIDE AIR INTAKE & EXHAUST AIR GRILLE LOCATIONS:
 - ALL OUTSIDE AIR INTAKE GRILLES MUST BE INSTALLED A MINIMUM OF 10'-0" FROM ANY EXHAUST AIR DISCHARGE OR VENT.
 - ALL EXHAUST AIR LOUVERS AND GRILLES TO BE INSTALLED A MINIMUM OF 10' FROM ANY OUTDOOR AIR INTAKE OR WINDOW.
- FIRE DAMPERS: (PROVIDED BY M.C.) INCLUDE FIRE DAMPERS AT ALL WALLS, CEILINGS, OR FLOOR PENETRATIONS AS REQUIRED BY CODE.
 - 1hr. DAMPERS BASED ON "RUSKIN", MODEL NO. 1BD2 W/FUSIBLE LINK (165°F), LEAKAGE CLASS IV. DAMPERS FOR GRILLES, DIFFUSORS, & REGISTERS ARE TO BE EQUAL TO RUSKIN MODEL "CFDR2". VERIFY WITH MANUF.
 - 2hr. DAMPERS BASED ON "RUSKIN", MODEL NO. 1BD23 STYLE B, W/FUSIBLE LINK (169°F), LEAKAGE CLASS IV.
- ROUGH-IN ALL CEILING DIFFUSERS, GRILLES AND CABINET UNIT HEATERS PER ARCHITECTURAL REFLECTED CEILING PLANS.
- ANCHOR HWS & HWR AT POINT "A", AS INDICATED ON PLANS.
- PROVIDE HWS & HWR EXPANSION COMPENSATORS — AS INDICATED HPWF OR LPS METRAFLEX.
- PROVIDE GUIDES — AT EXPANSION COMPENSATORS.
- REFER TO ARCHITECTURAL PLANS FOR ALL BUILDING SECTIONS. MECHANICAL EQUIPMENT AND INSTALLATION METHODS SHOWN ON ARCHITECTURAL SECTIONS/DETAILS ARE CONSIDERED AS PART OF MECHANICAL CONTRACT DOCUMENTS.
- COORDINATE ALL PIPE & DUCT RISERS IN CHASES WITH ALL OTHER TRADES.
- MECHANICAL TRADES TO ENSURE THAT ALL DUCT PENETRATION THRU GAU WALLS TO HAVE PROPER LINTELS. SEE ARCHITECTURAL SHT'S. FOR LINTEL SIZES. ALL LINTELS SHALL BE PROVIDED BY ARCH. TRADES.

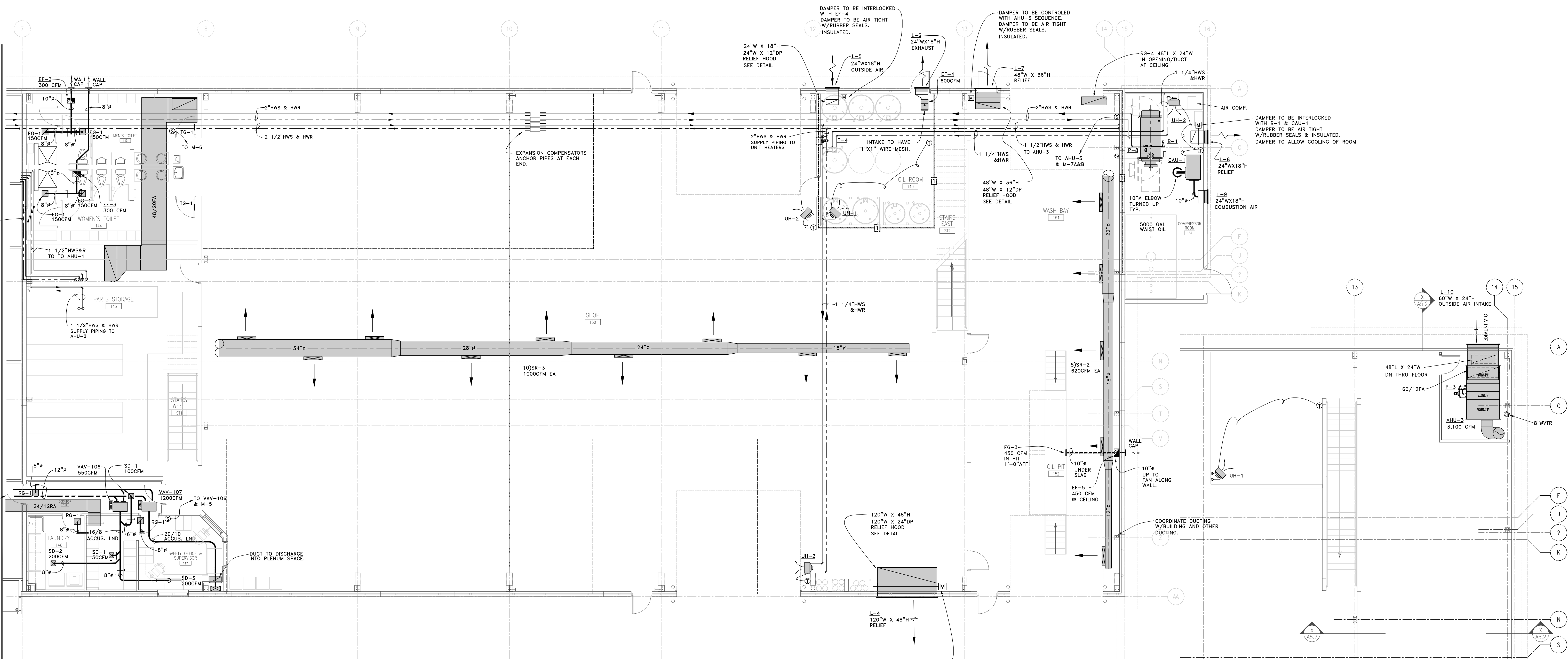
2012 PROJECT FLOOR PLAN
FISHER CONTRACTING
 3401 CONTRACTOR DR.
 MIDLAND, MI 48640
 JOB NUMBER
E11-318

CONTINUED ON SHEET A4.1

2" CWS&R TO TO AHU-1

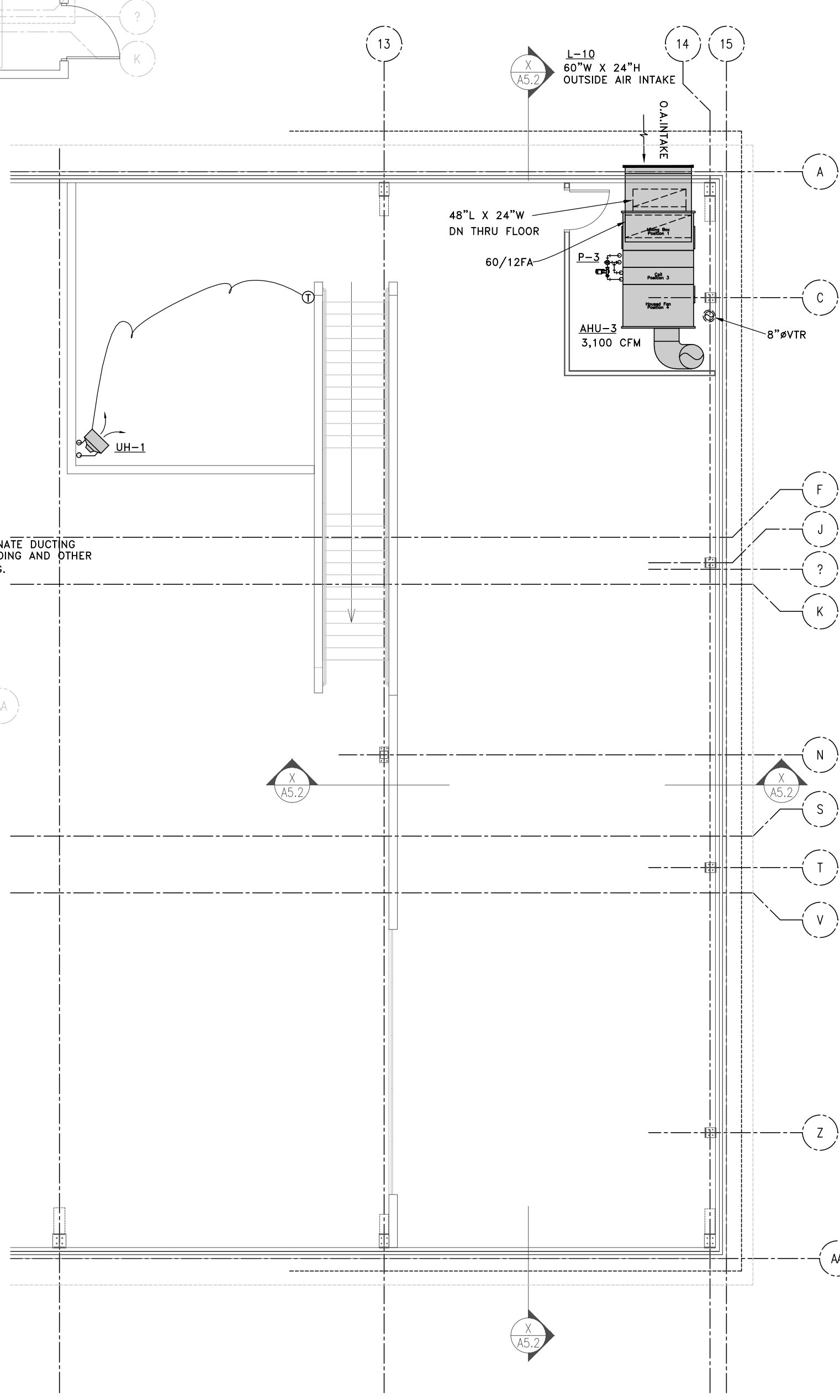
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CONTINUED ON SHEET A4.1



FLOOR PLAN - SHOP (FIRST FLOOR) - MECH.

SCALE: 1/8" = 1'-0" FIRST FLOOR SQ.FT. - 7,405 TOTAL SQ.FT. - 26,490



FLOOR PLAN - MEZZANINE (EAST) - MECH.

SCALE: 1/8" = 1'-0" MEZZANINE (WEST) SQ.FT. - 2,345 TOTAL SQ.FT. - 26,490

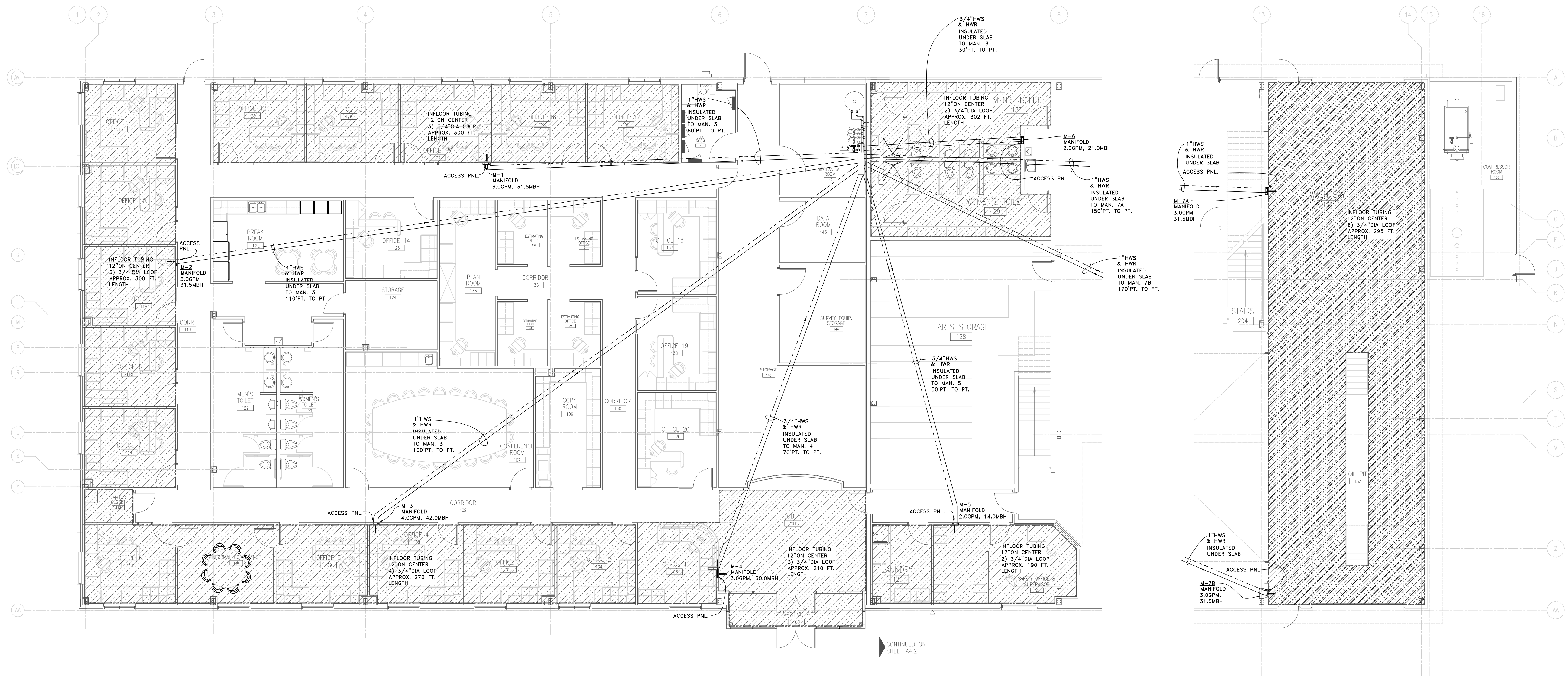


20012 PROJECT FLOOR:

FISHER CONTRACTING
3401 CONTRACTOR DR.
MIDLAND, MI 48640

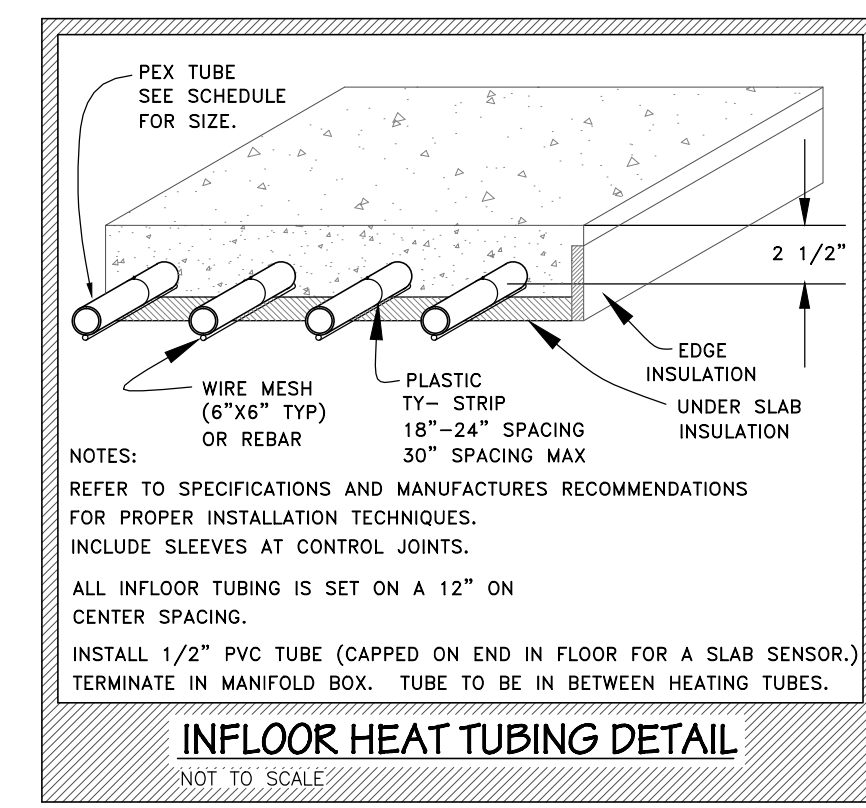
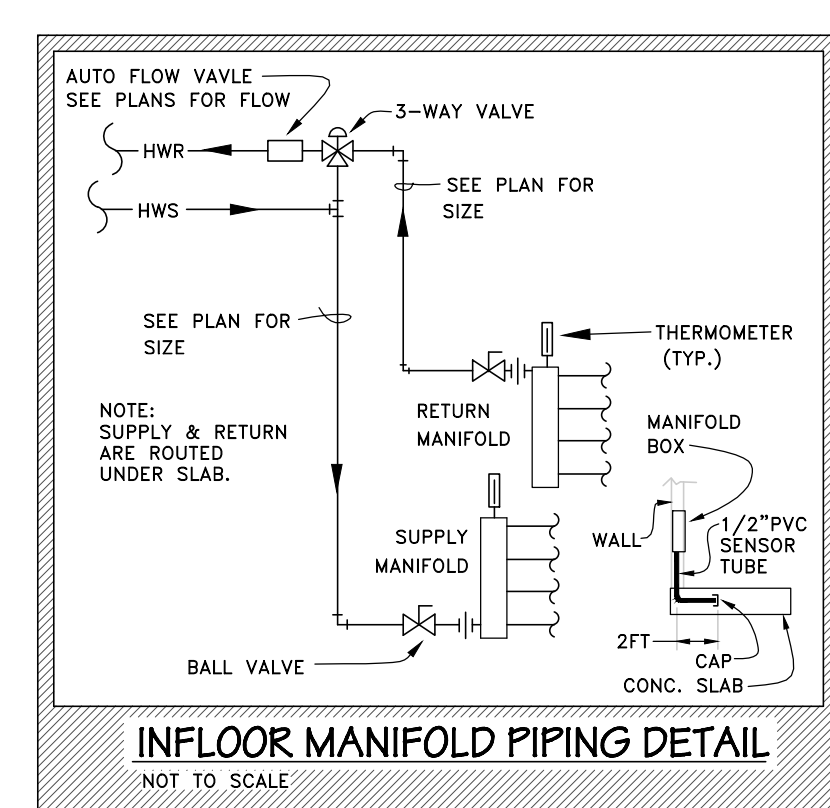
JOB NUMBER
E11-318

<p>Apollo Engineering LLC E-Mail: apollo_mtl_eng@yahoo.com</p>	<p>8690 S. Lakeview Rd. Traverse City, MI 49684 (231) 932-0800 office</p>	<p>PROJECT: 1106-03 M2.2</p>

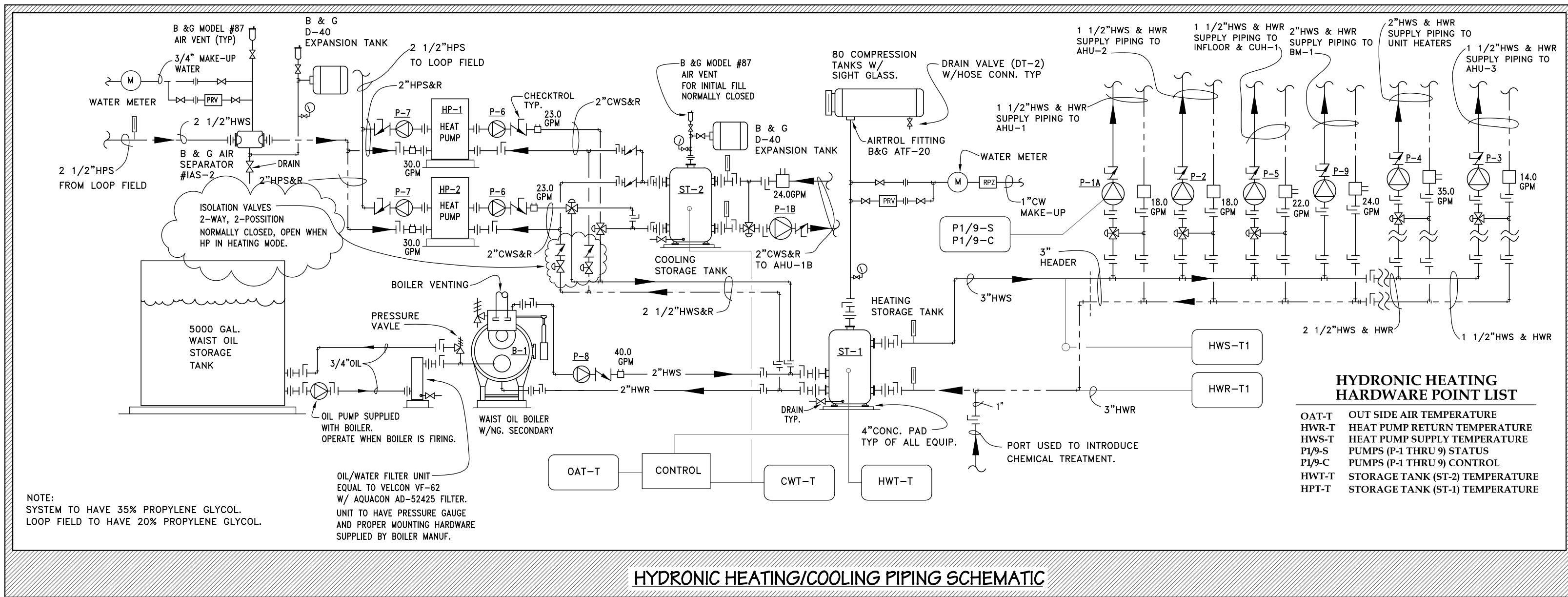


FLOOR PLAN - OFFICE - INFLOOR PLAN
 SCALE : 1/8" = 1'-0"

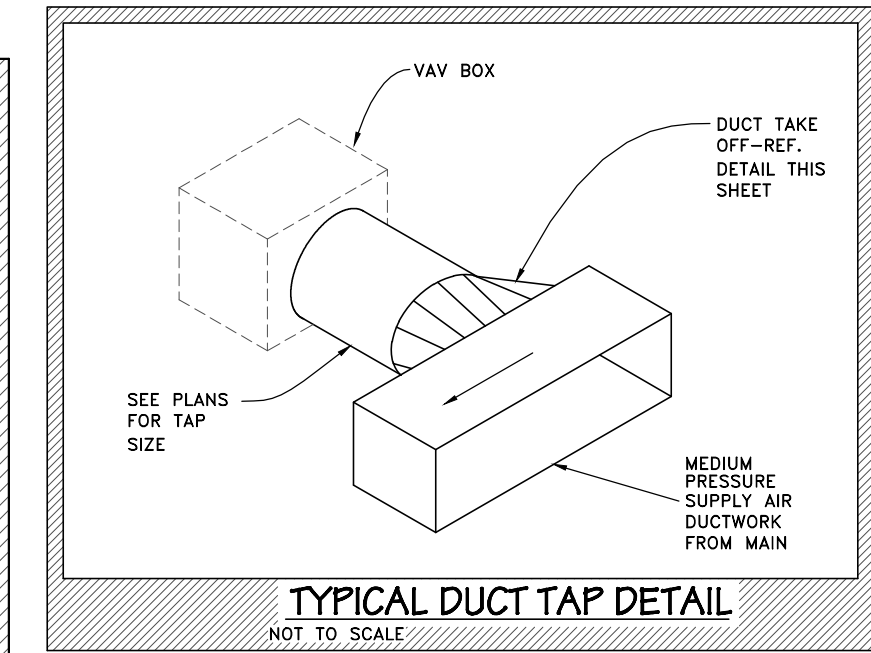
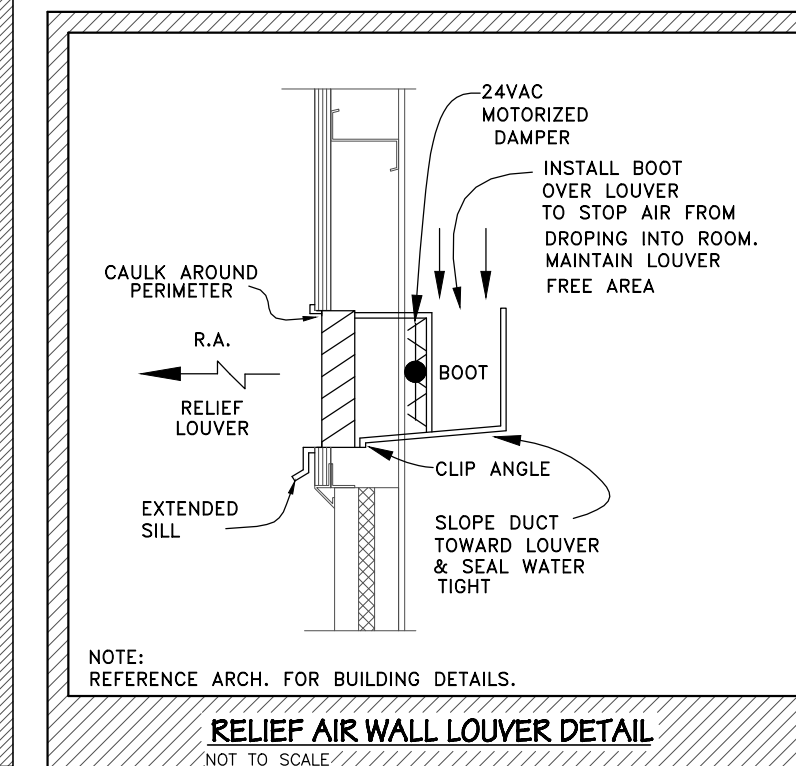
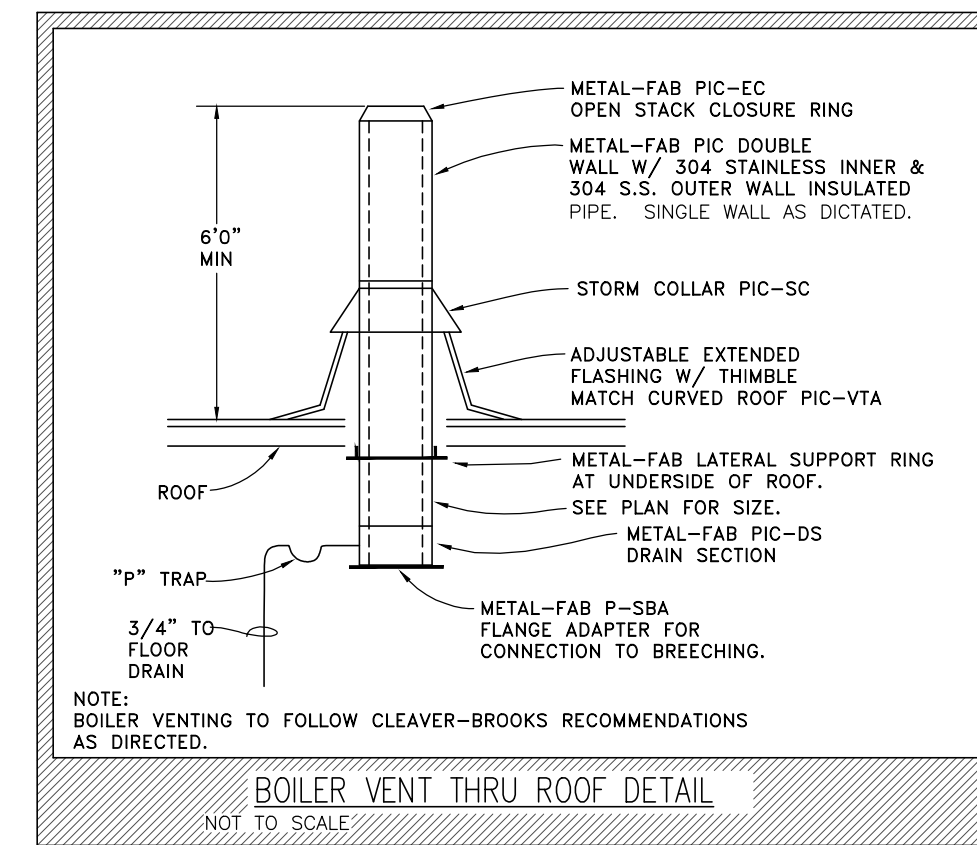
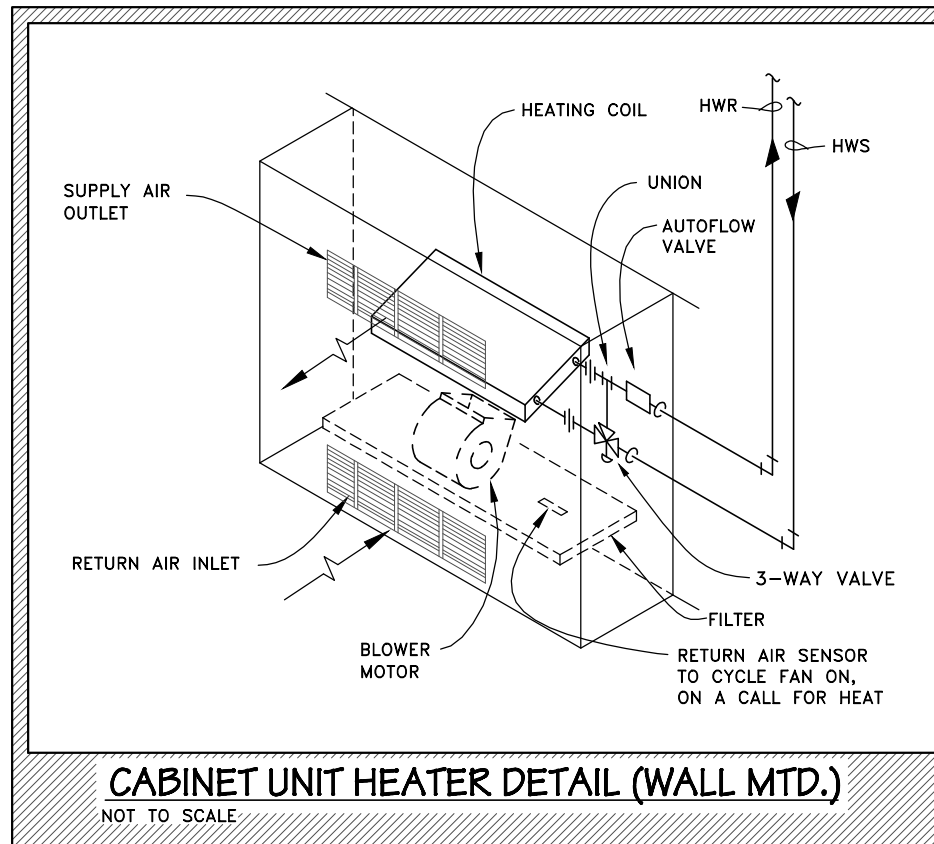
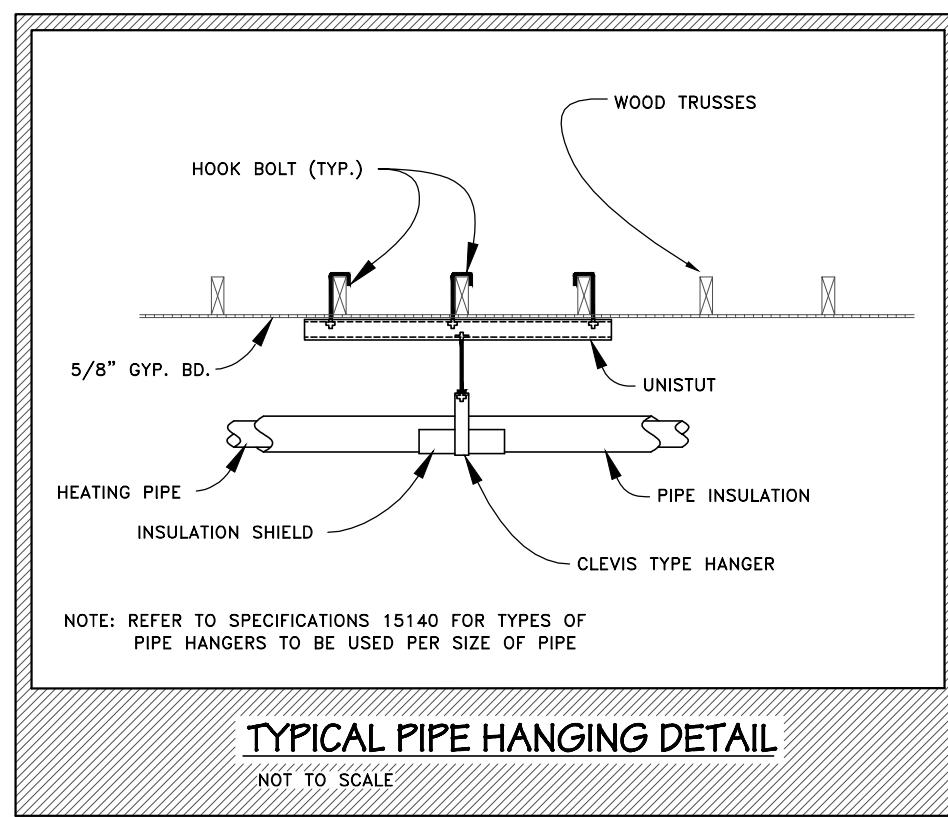
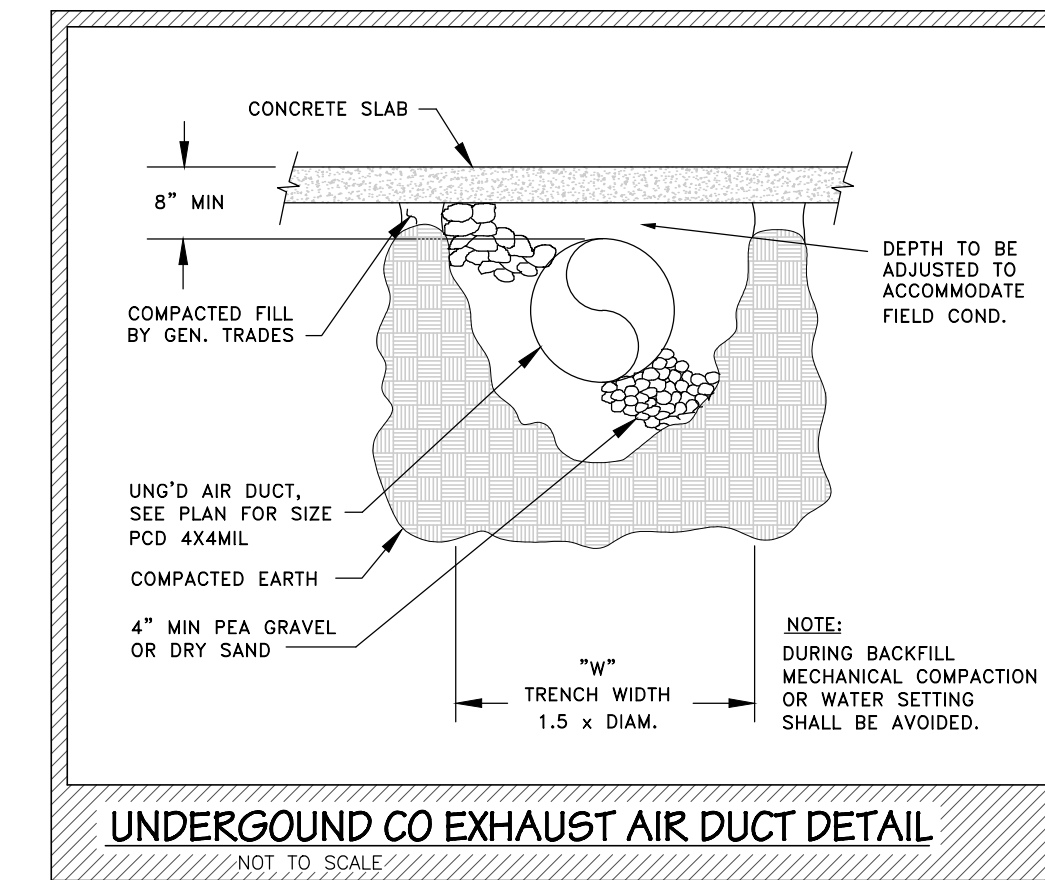
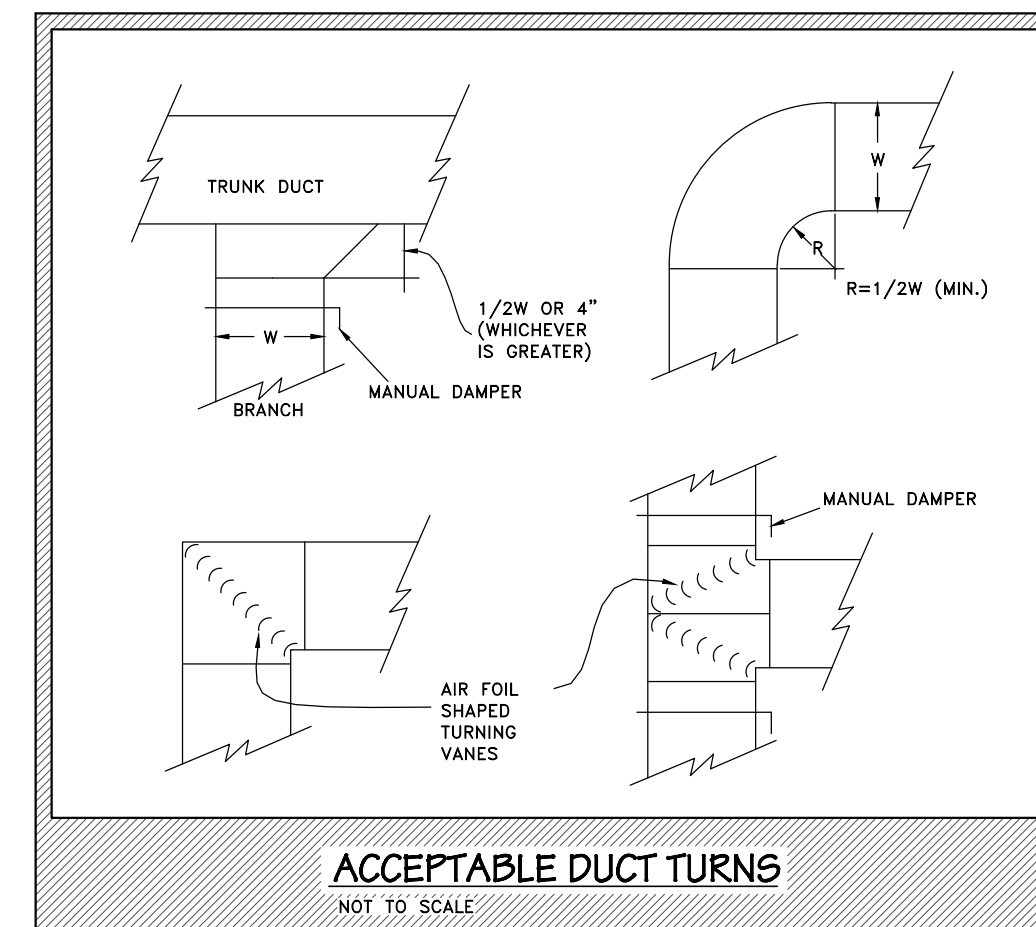
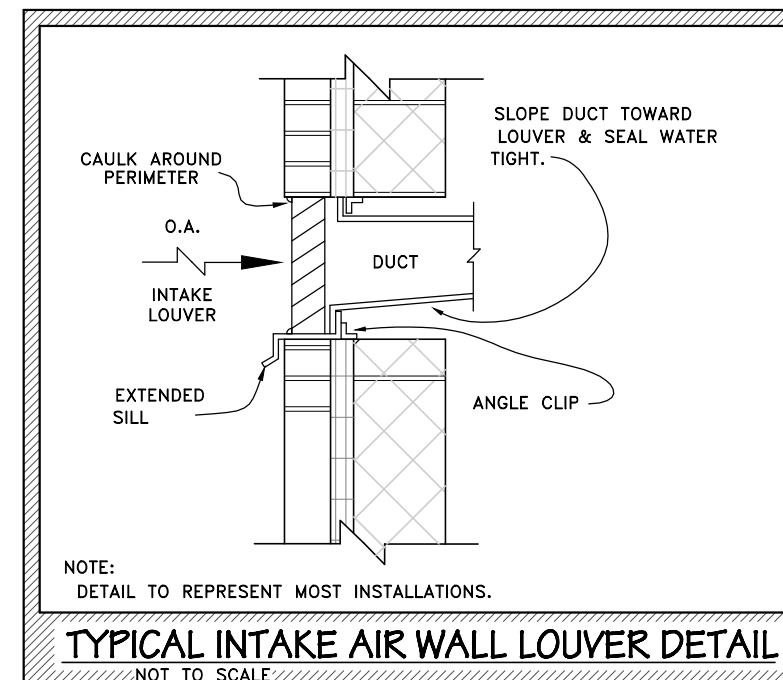
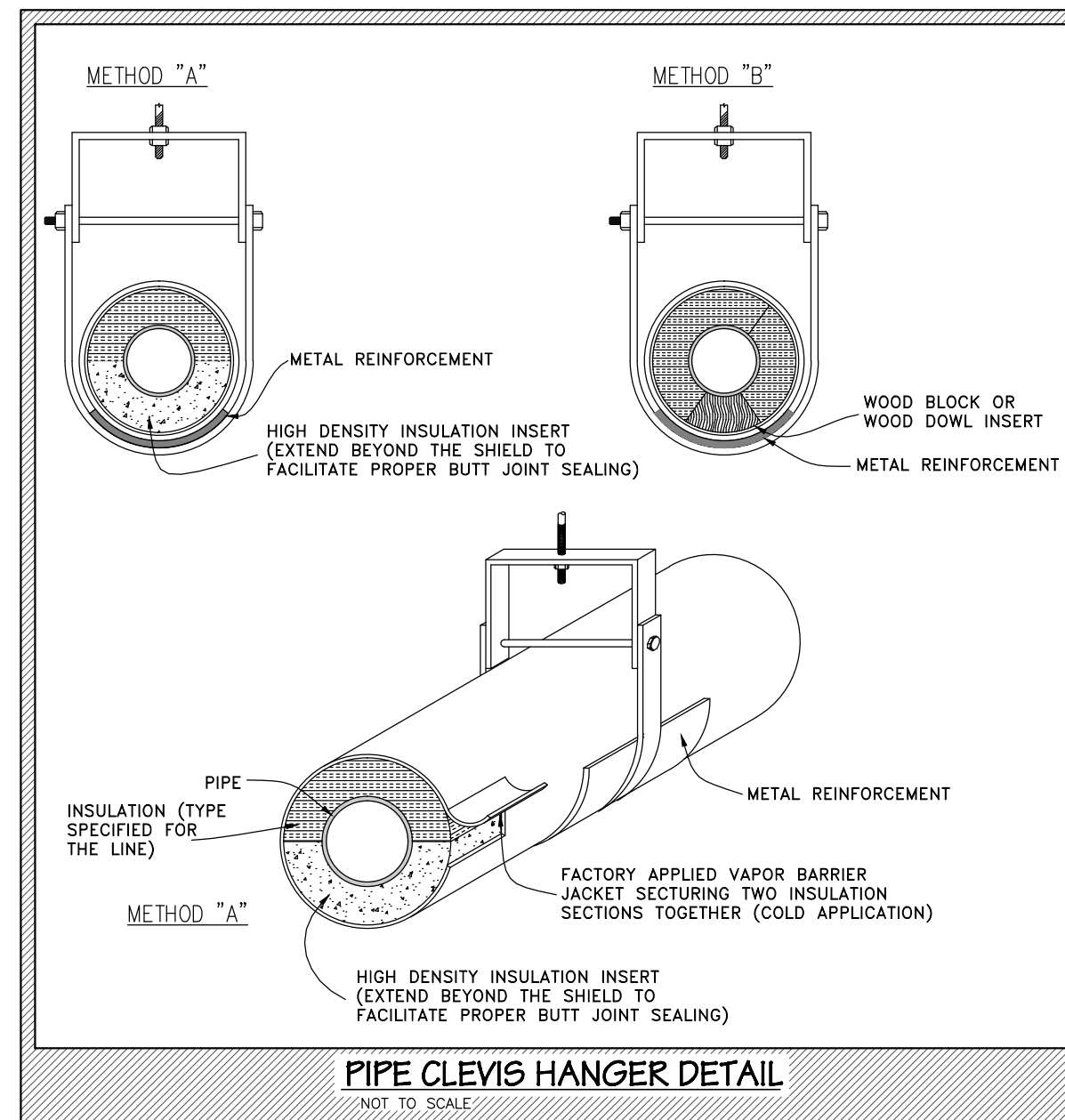
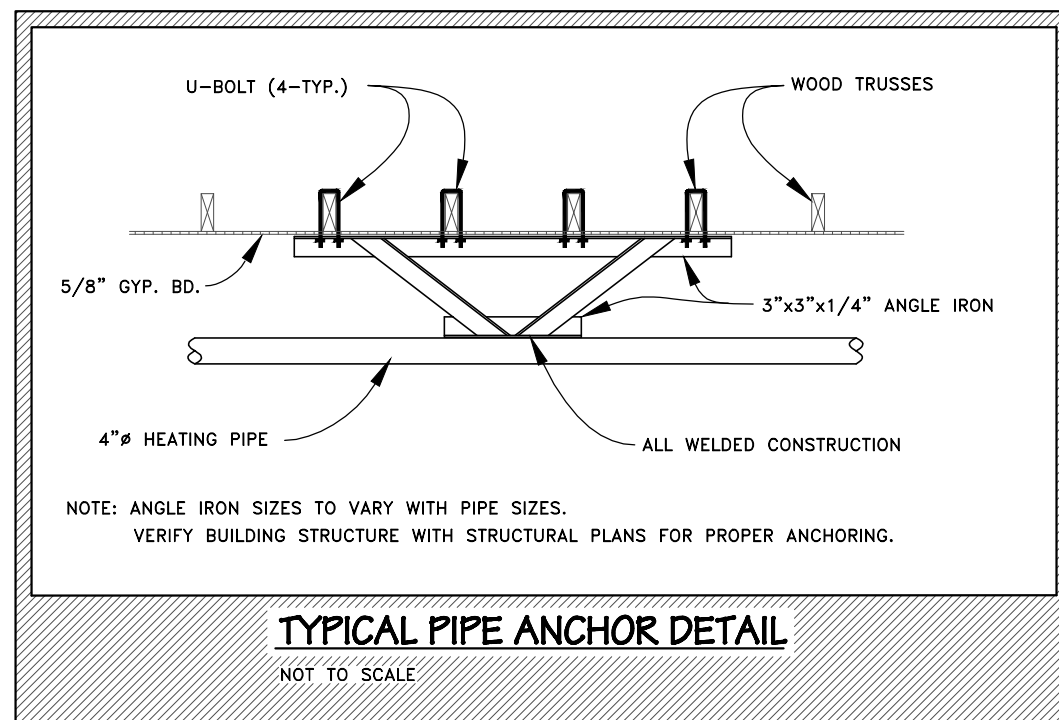
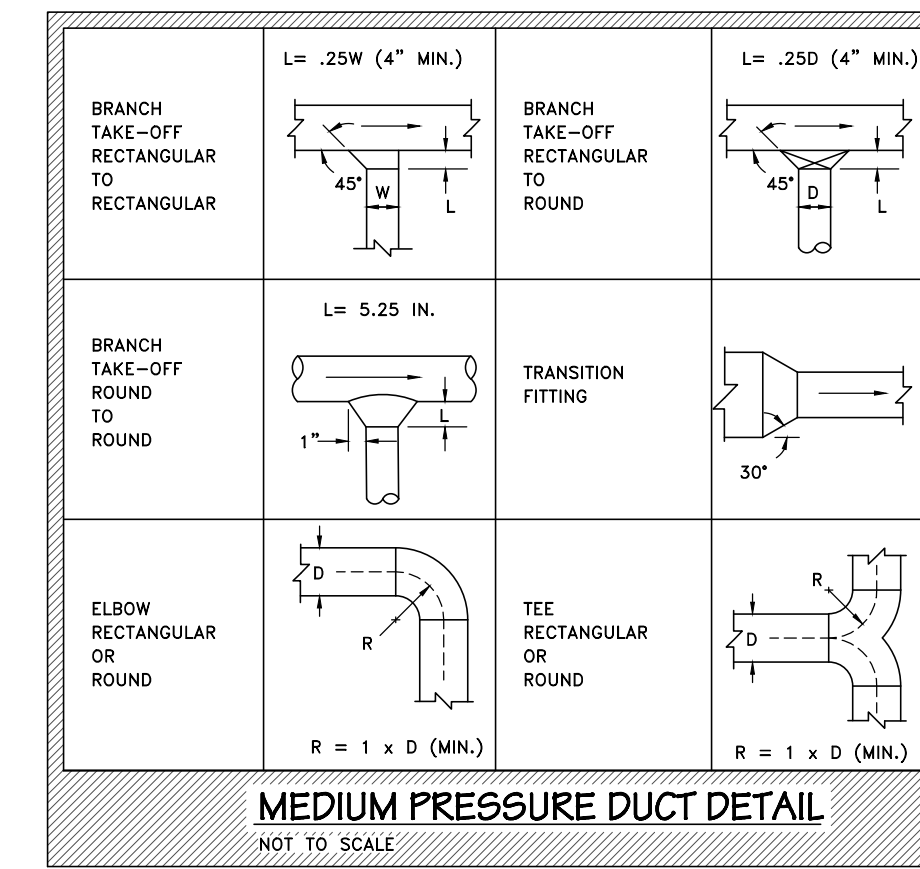
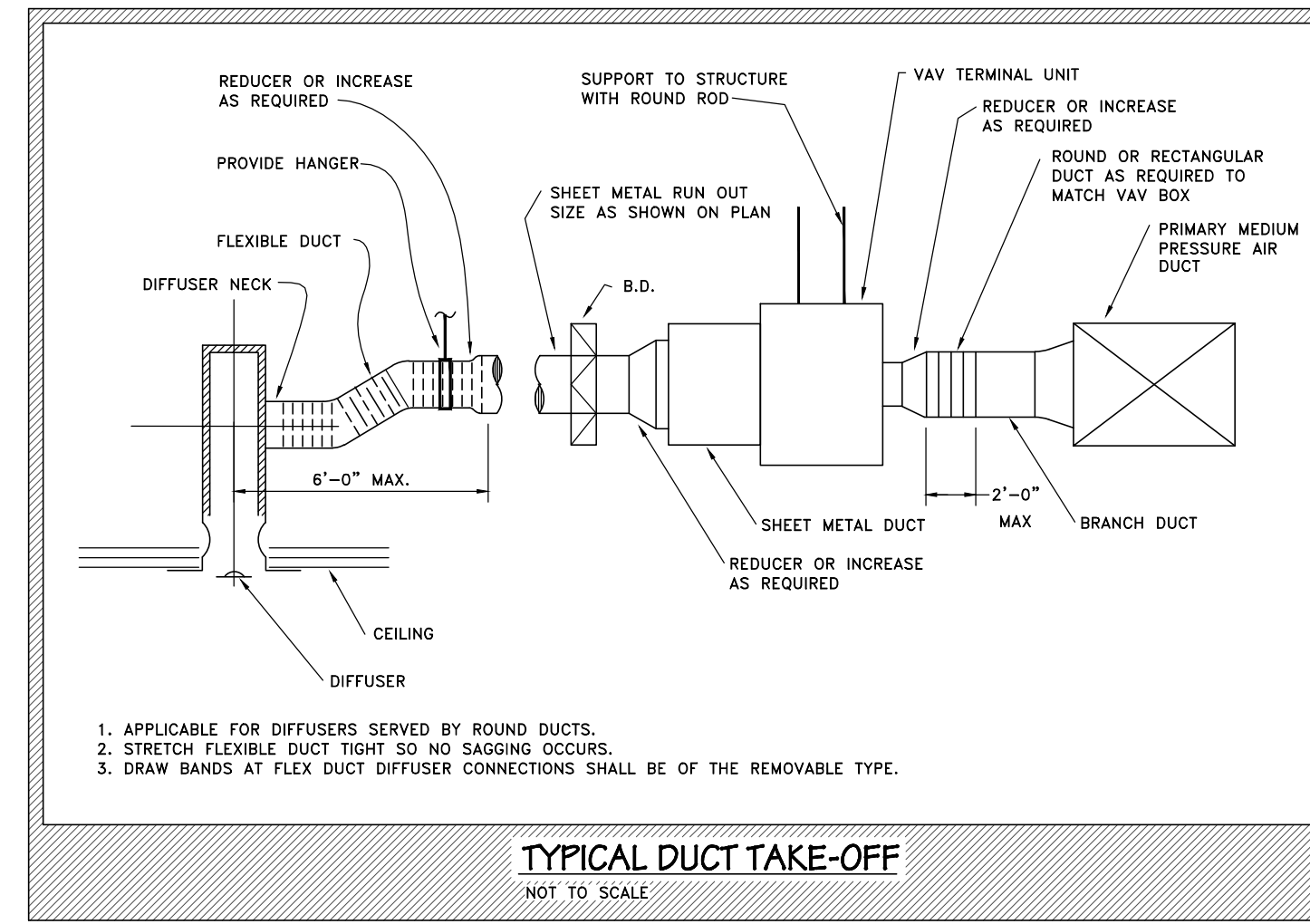
FLOOR PLAN - SHOP INFLOOR PLAN
 SCALE : 1/8" = 1'-0"



2012 PROJECT FOR:
FISHER CONTRACTING
 3401 CONTRACTOR DR.
 MIDLAND, MI 48640
 JOB NUMBER:
E11-318



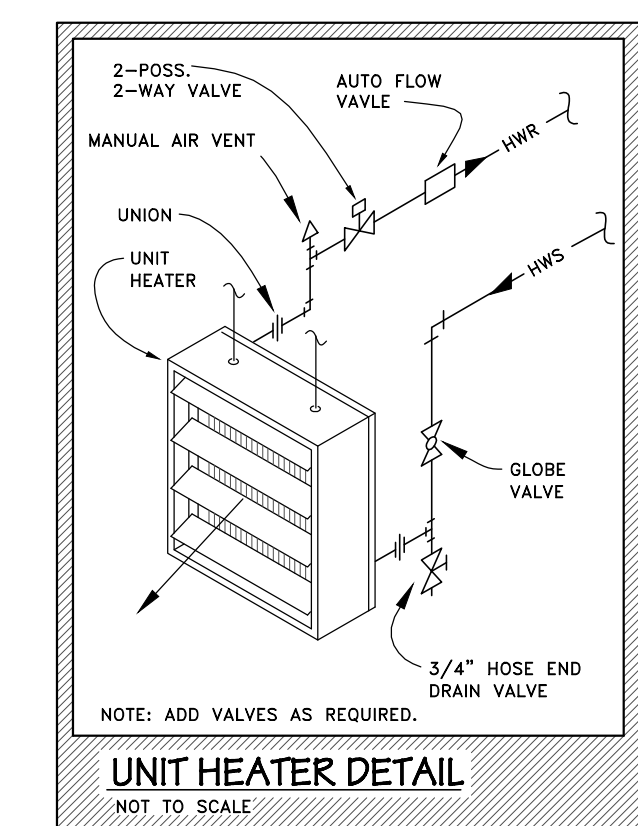
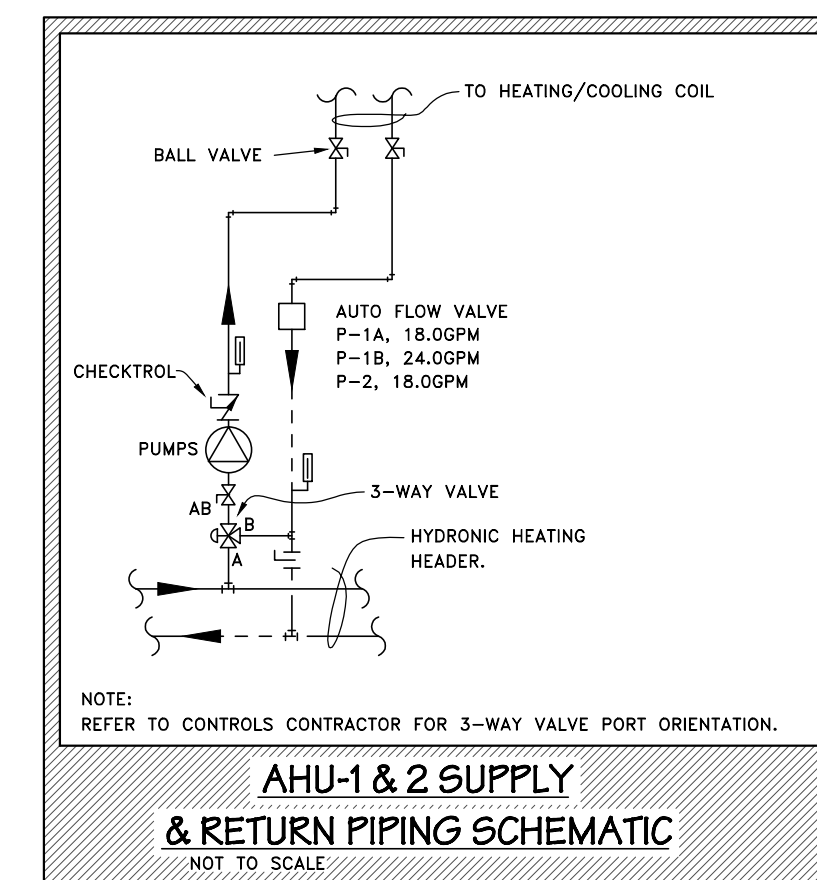
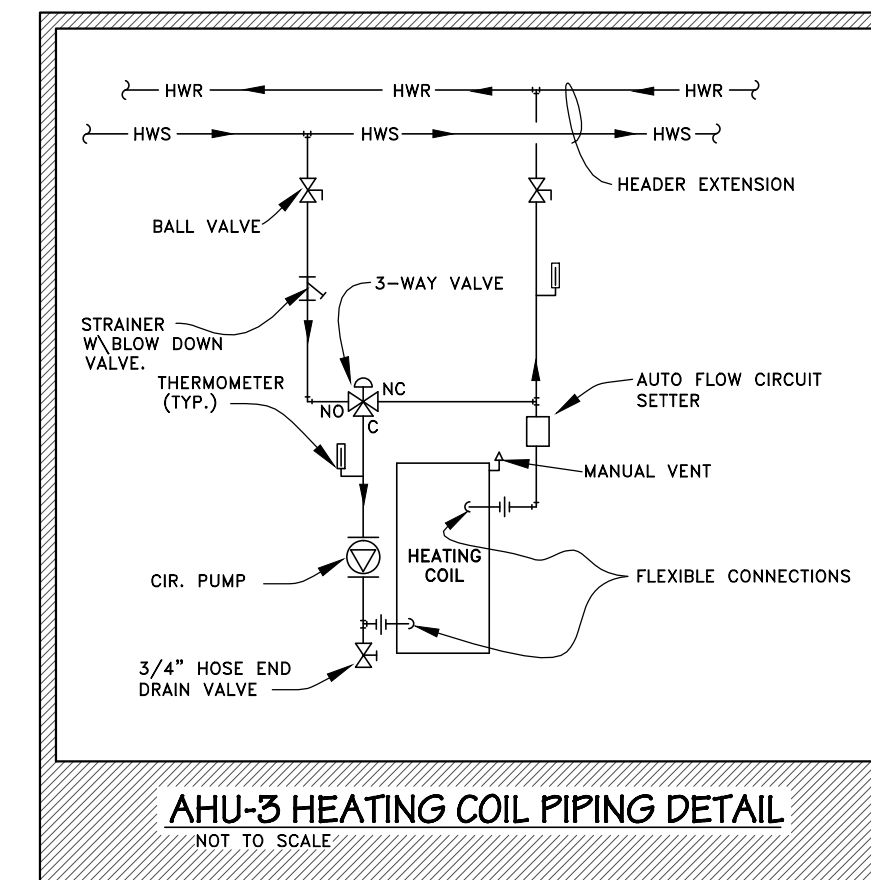
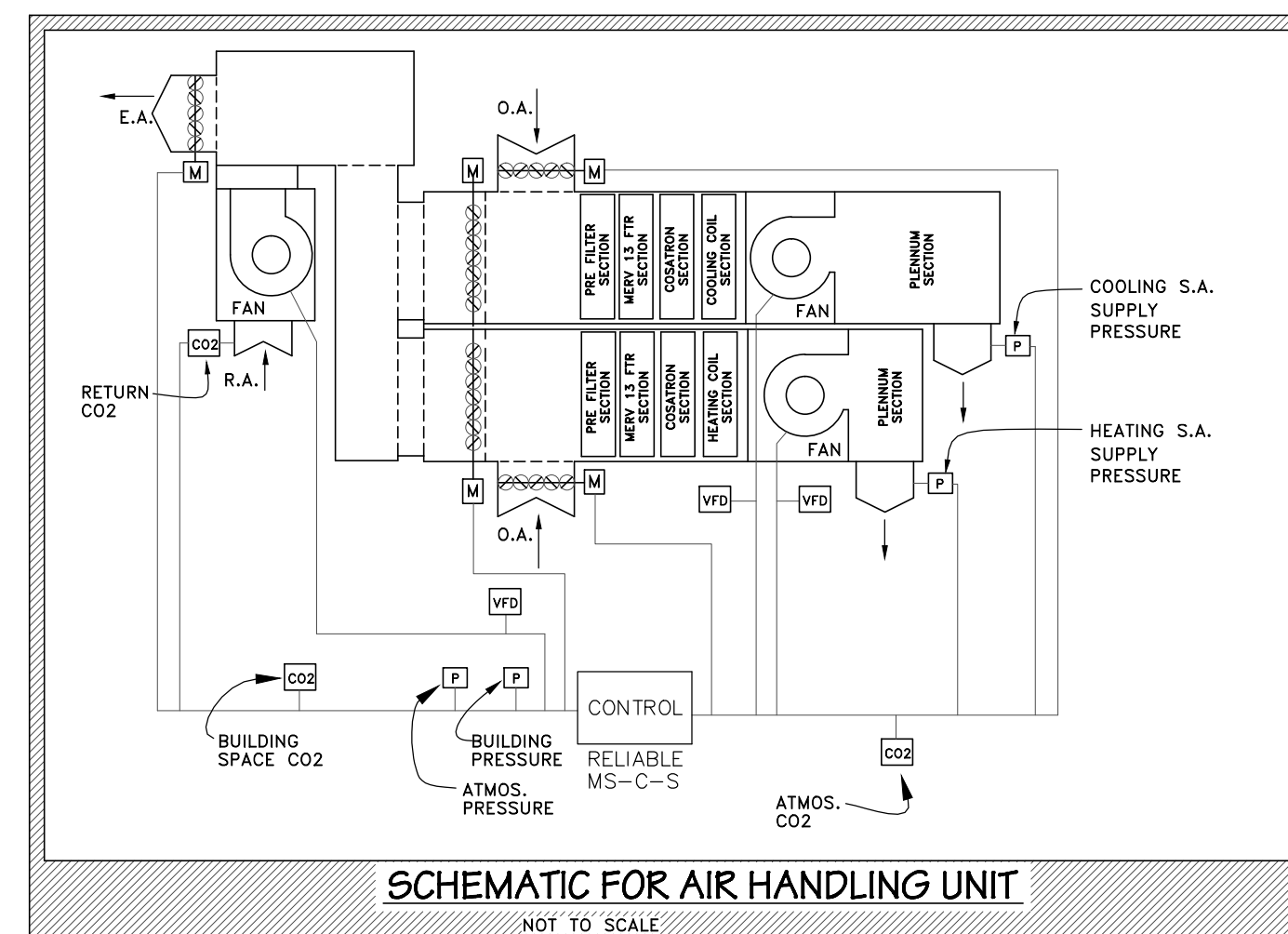
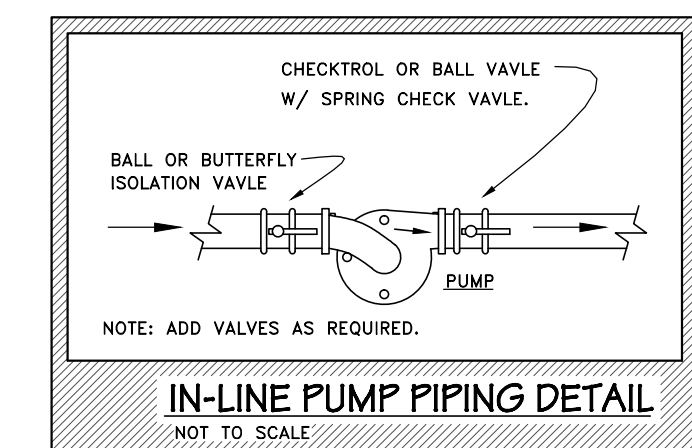
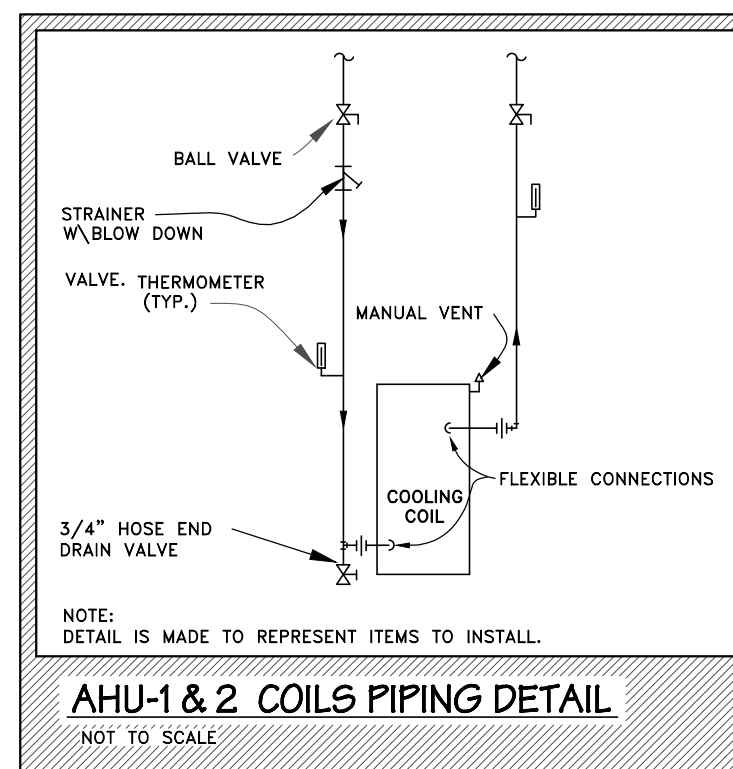
HYDRONIC HEATING/COOLING PIPING SCHEMATIC
NOT TO SCALE



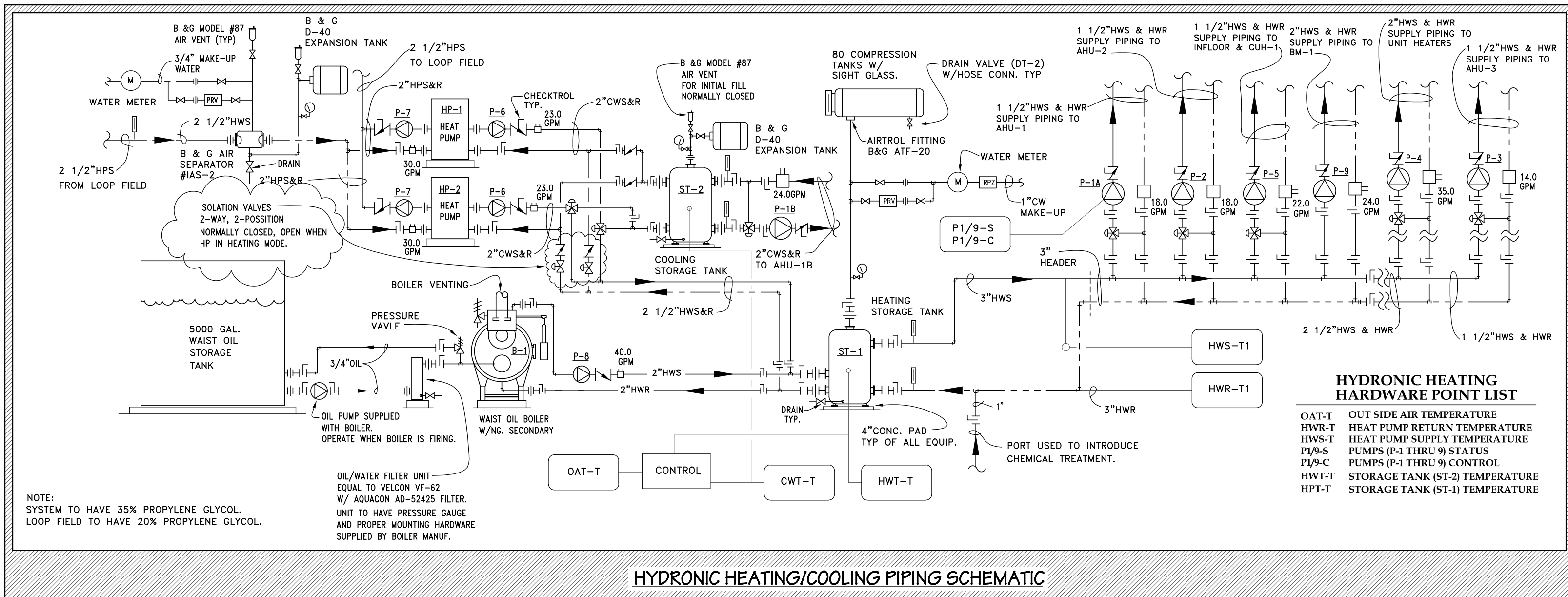
PIPING/TUBING SIZING EQUIVALENT CHART

NOMINAL SIZE	COPPER PIPE FLOW RANGE (GPM)	STEEL TUBING FLOW RANGE (GPM)	PEX TUBING FLOW RANGE (GPM)	PE TUBING* FLOW RANGE (GPM)
1/2"	0.5-1.2	0.8-1.8	0.5-1.5	N/A
3/4"	2.5-3.5	1.7-4.0	1.5-4.0	1.8-4.5
1"	3.1-7.5	3.5-7.5	1.6-7.5	3.5-9.0
1 1/4"	5.5-13.0	7.0-16.0	7.5-13.0	7.0-14.0
1 1/2"	9.0-21.0	10.0-24.0	11.0-21.0	9.0-21.0
2"	20.0-45.0	20-47.0	15.0-32.0	19.0-65.0
2 1/2"	35.0-80.0	33.0-75.0	N/A	N/A
3"	65.0-130.0	60.0-140.0	N/A	65.0-130.0
4"	N/A	120.0-280.0	N/A	120.0-250.0
5"	N/A	220.0-510.0	N/A	N/A
6"	N/A	350.0-840.0	N/A	250.0-630.0
8"	N/A	850+	N/A	640-850

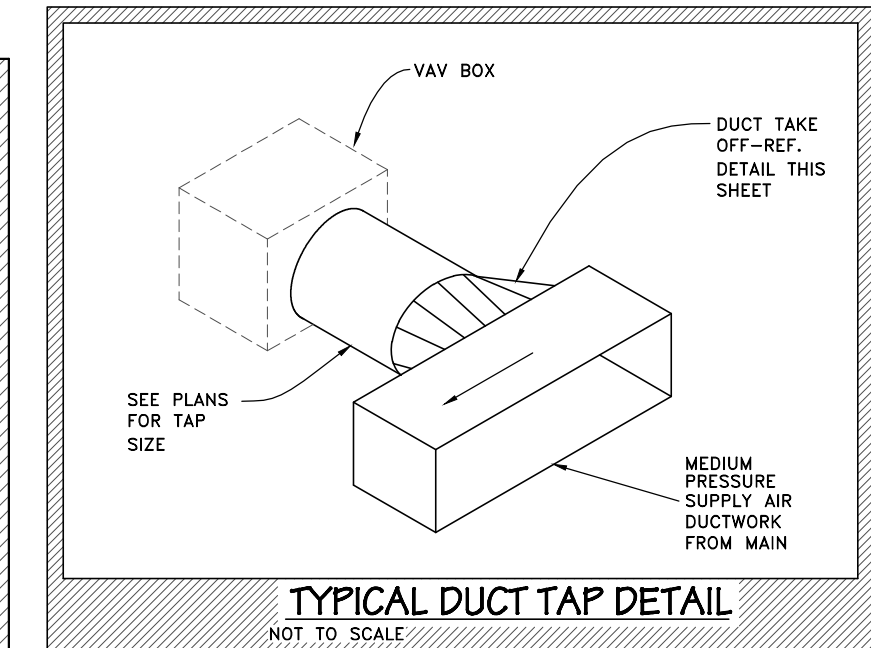
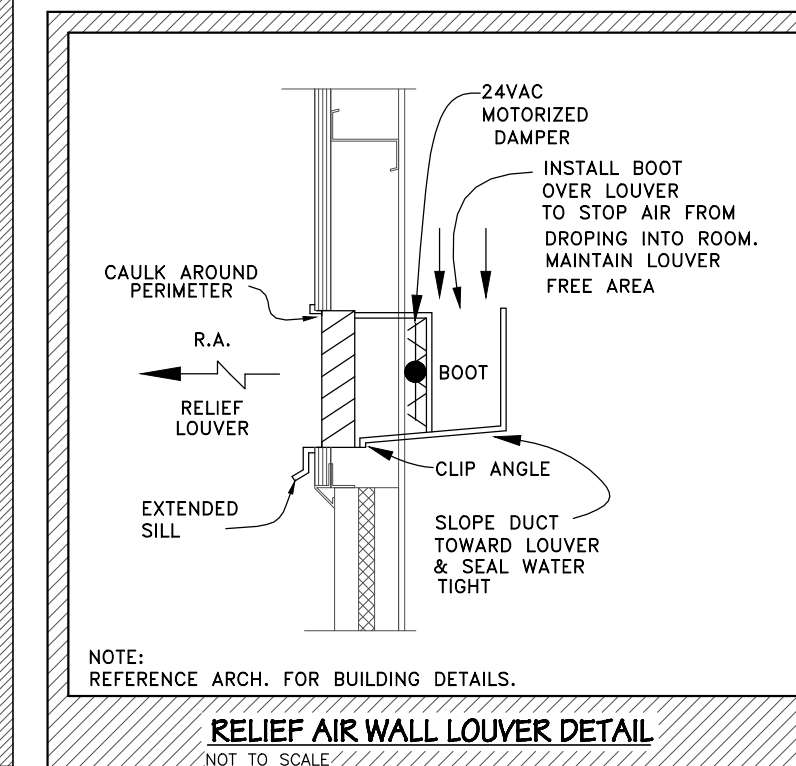
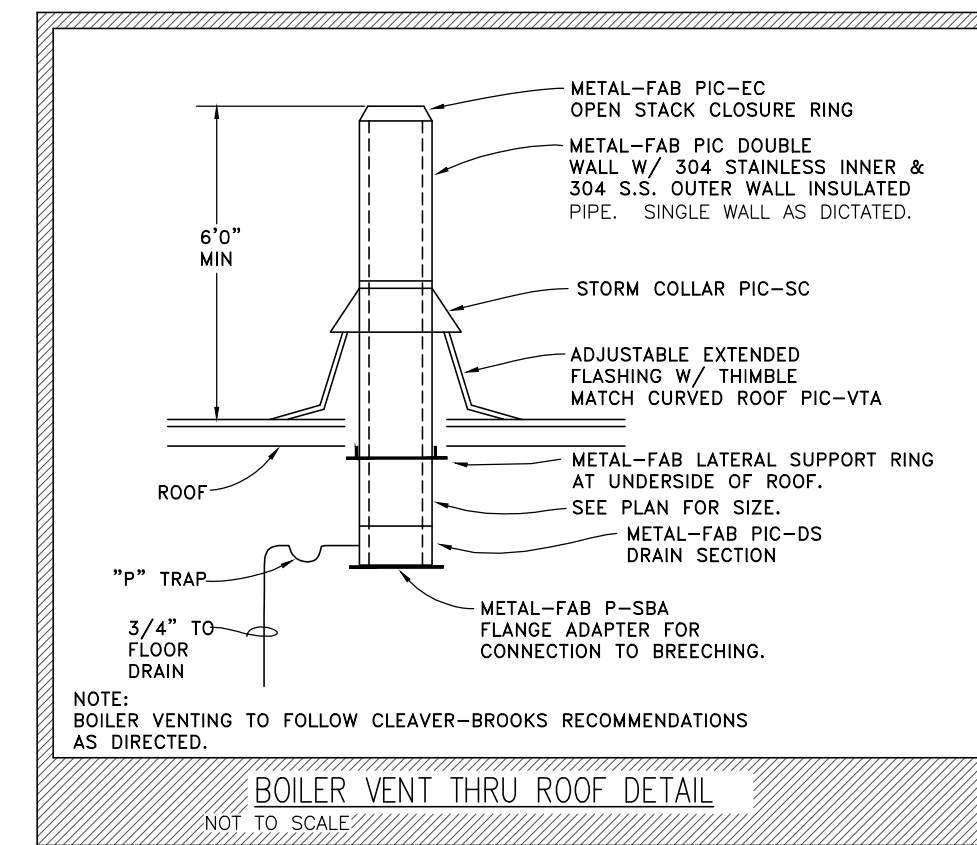
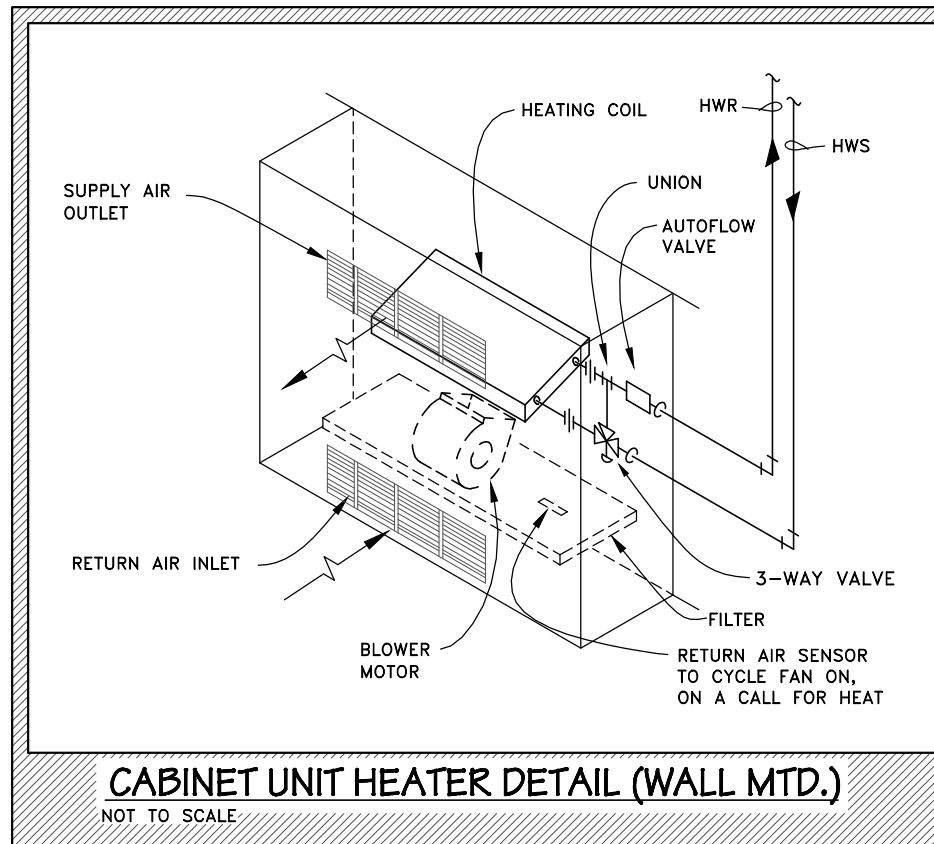
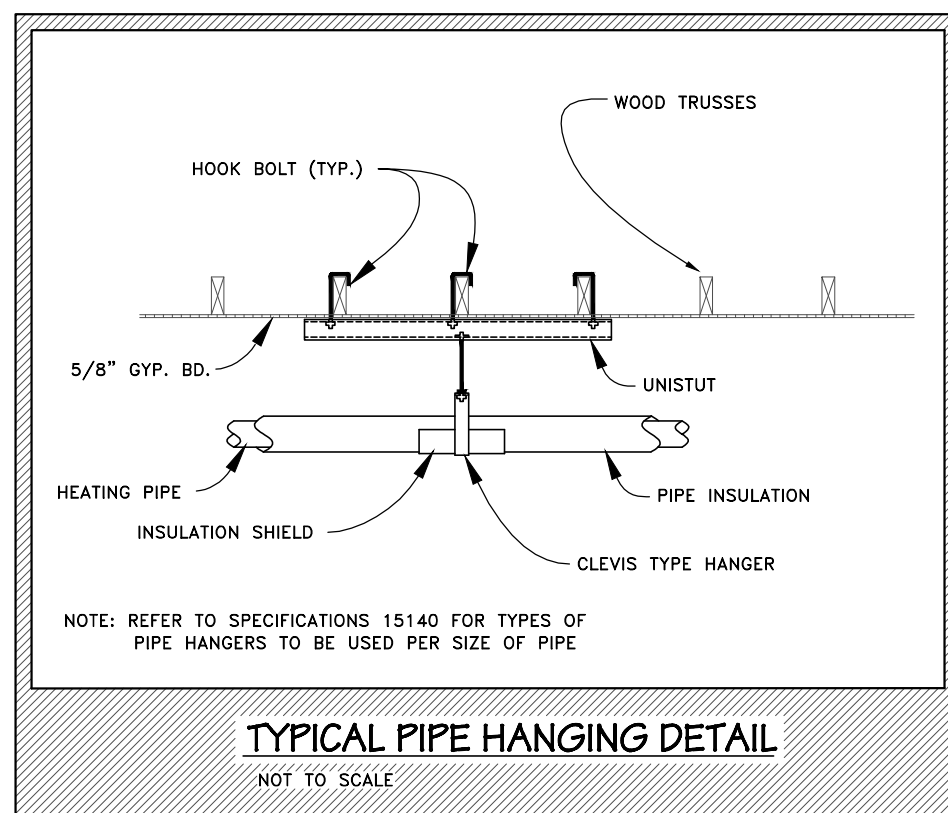
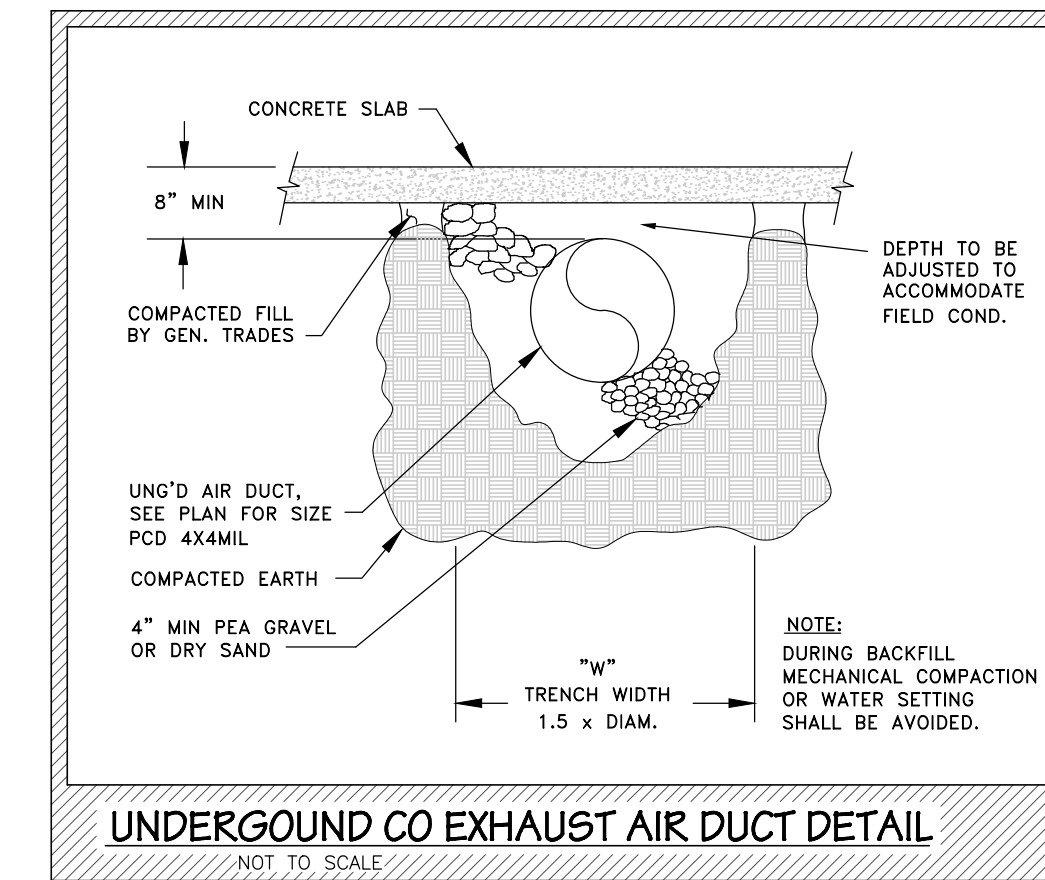
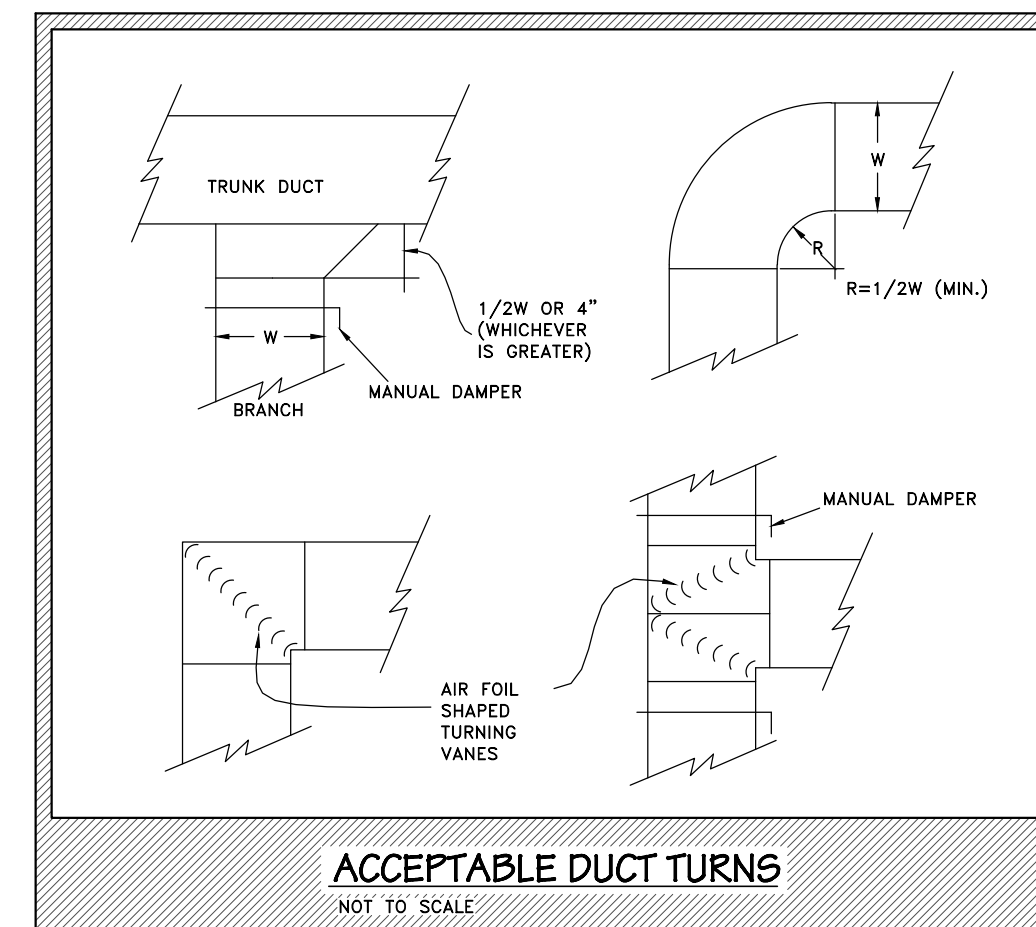
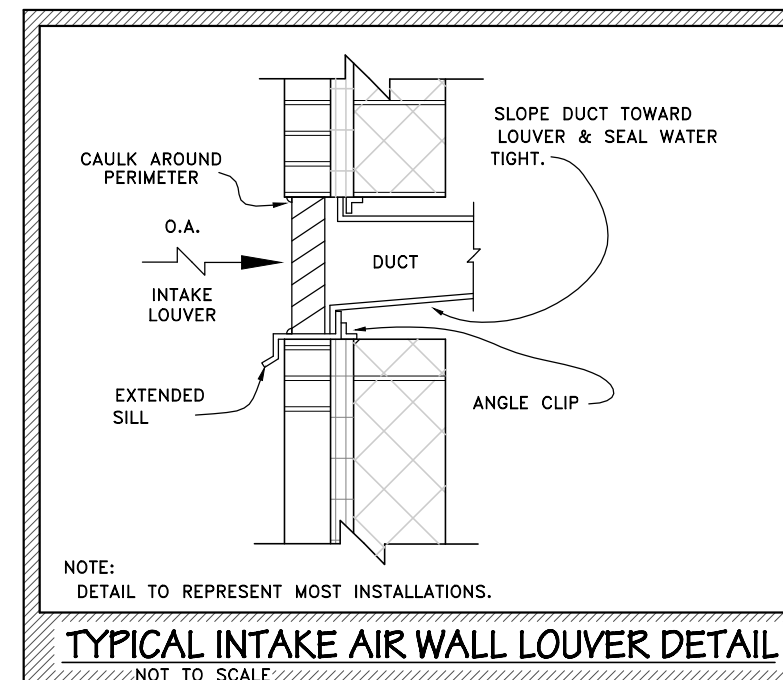
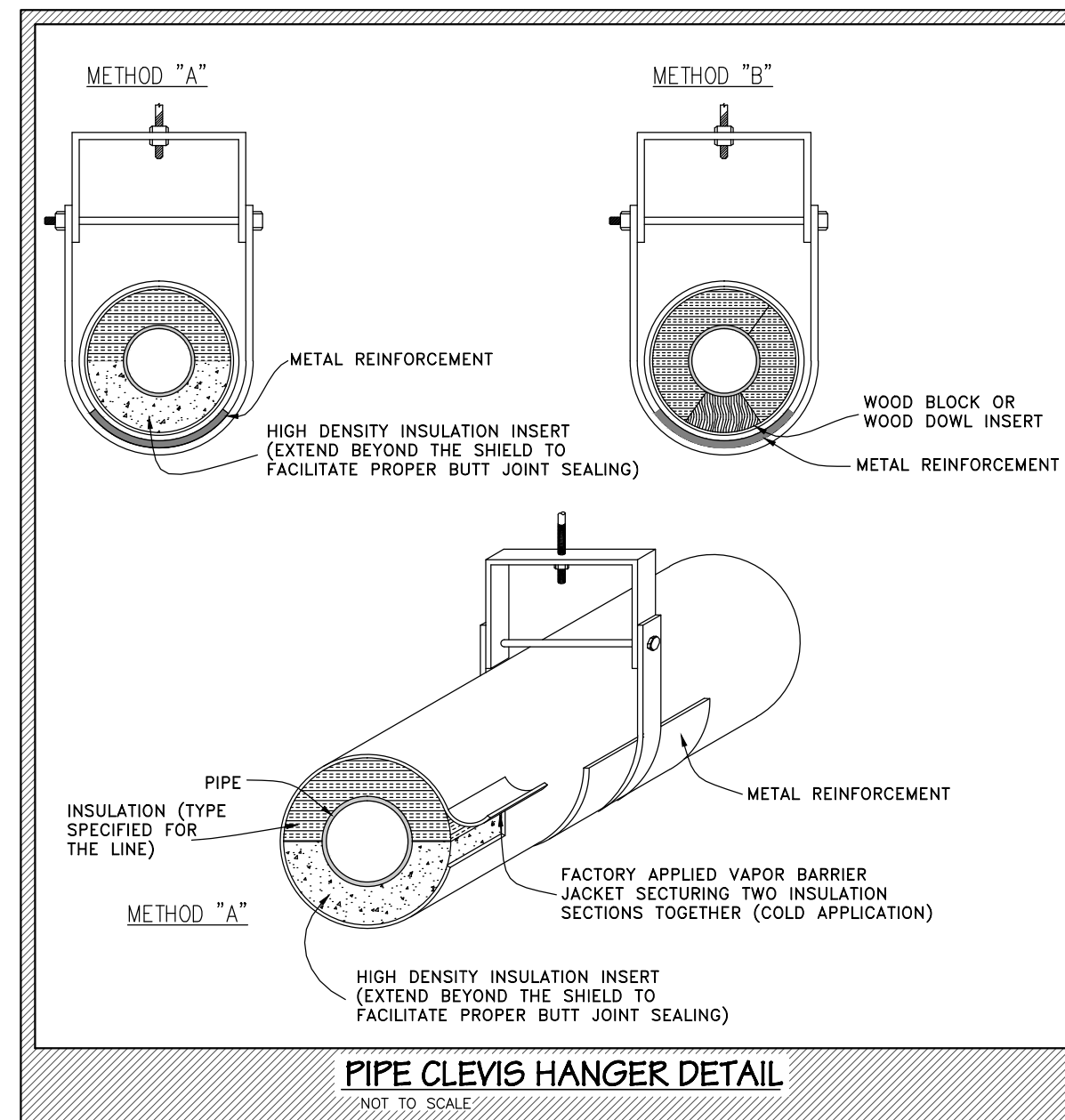
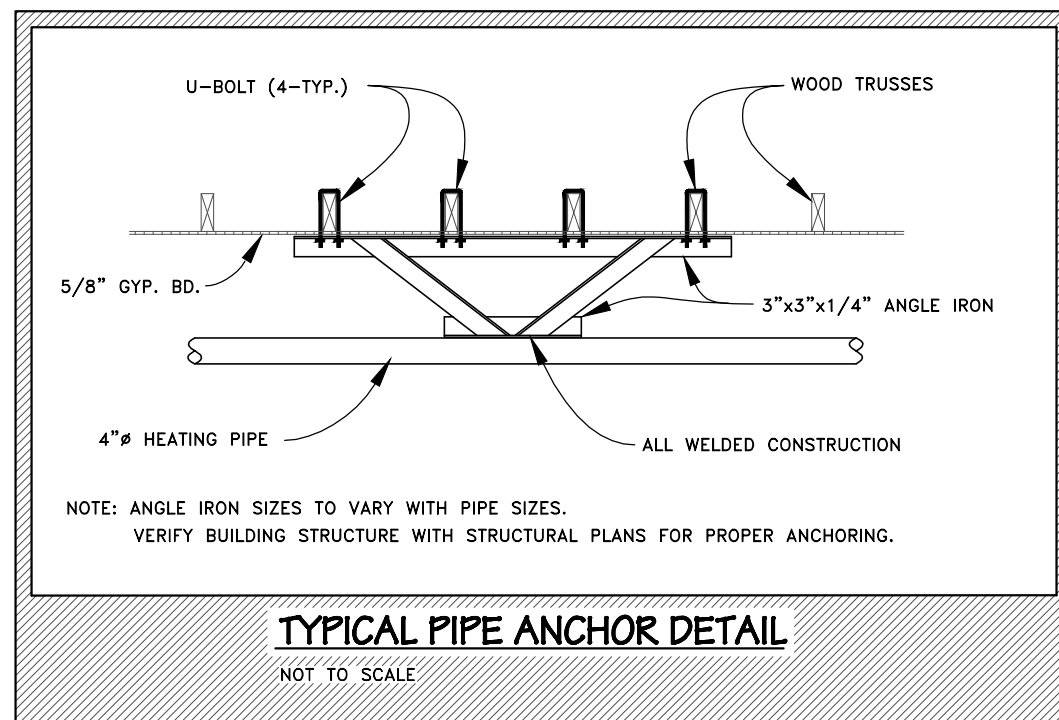
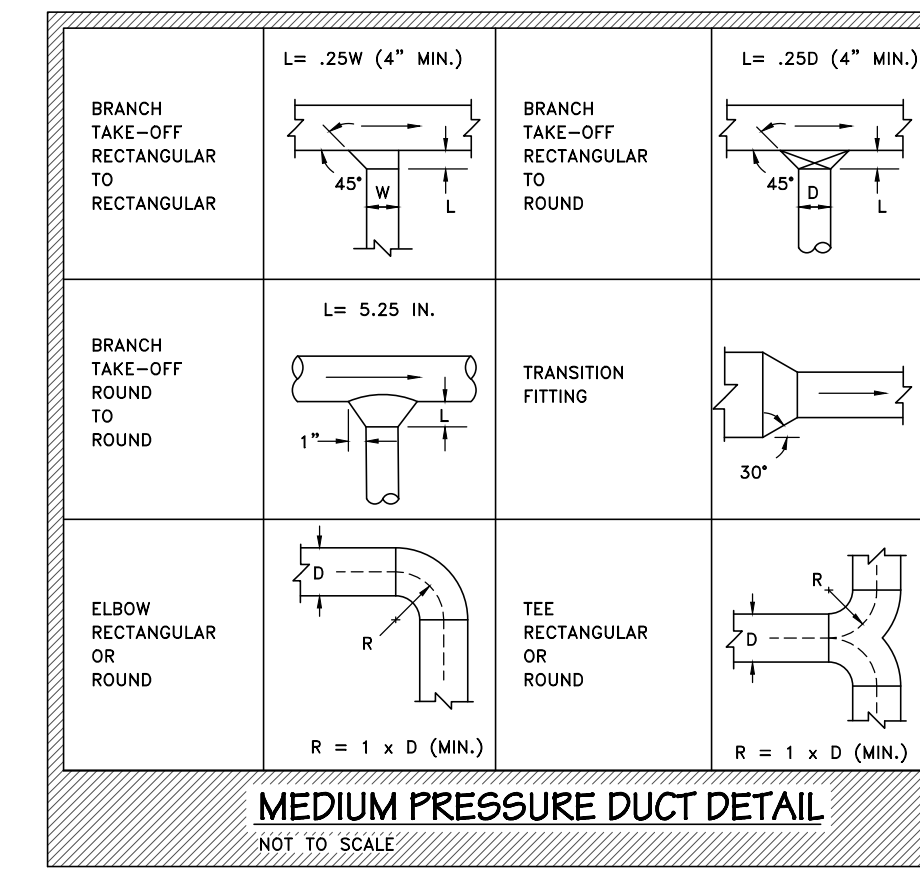
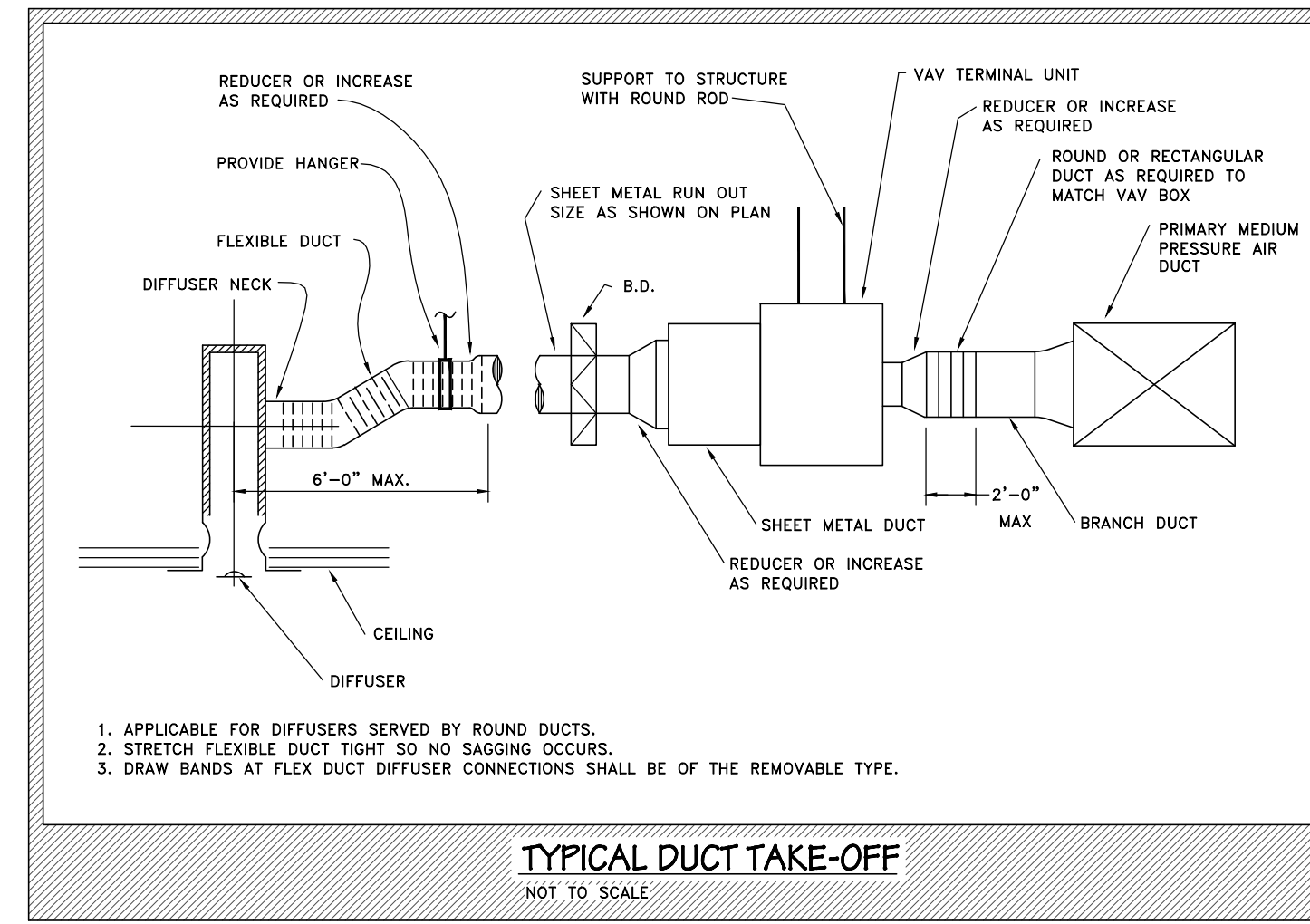
NOTES:
1. FLOWS ARE GIVEN TO MAINTAIN SIMILAR VELOCITIES IN PIPING/TUBING.
2. REFER TO PIPING FLOW TAGS TO DETERMINE ACCEPTABLE DIAMETERS.
3. HANGER SPACING REQUIREMENTS FOR METAL PIPING AND PLASTIC PIPING SHOULD BE DETERMINED TO ASSURE PROPER INSTALLATION.
* BASED ON HDPE 3408 & ASTM D3035 (GOOD ONLY FOR GEO EXCHANGE LOOP SYSTEMS).



2012 PROJECT
FISHER CONTRACTING
 3401 CONTRACTOR DR.
 MIDLAND, MI 48640
 JOB NUMBER
E11-318
 DRAWING
M3.1



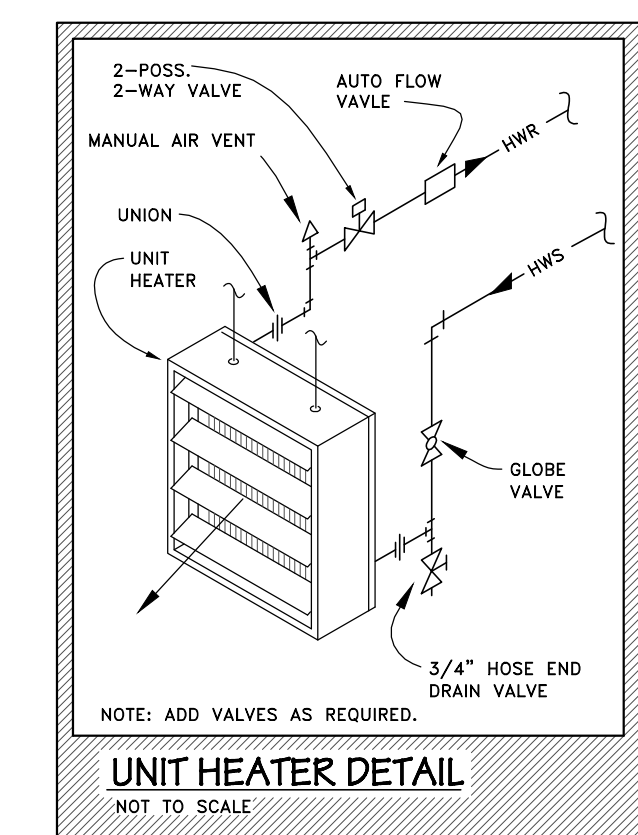
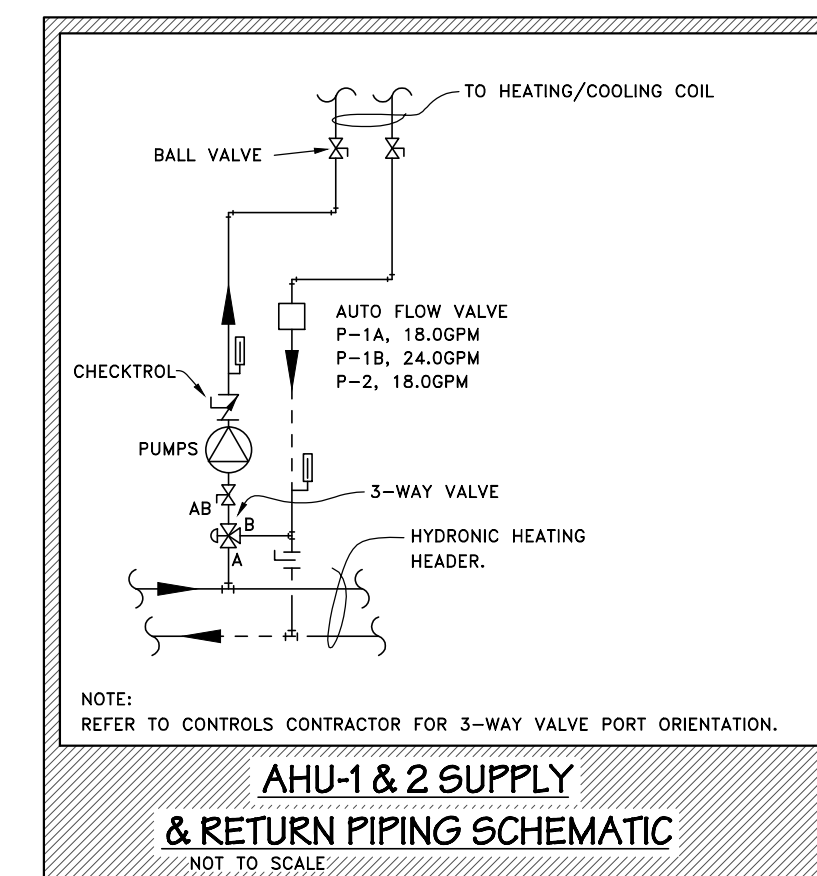
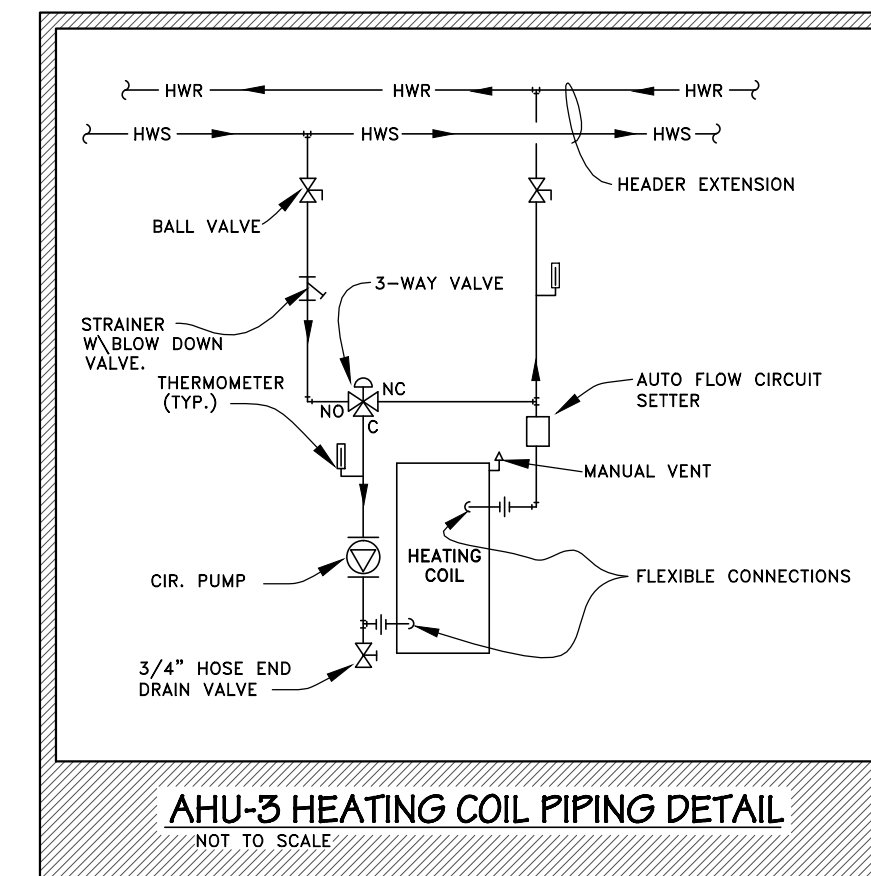
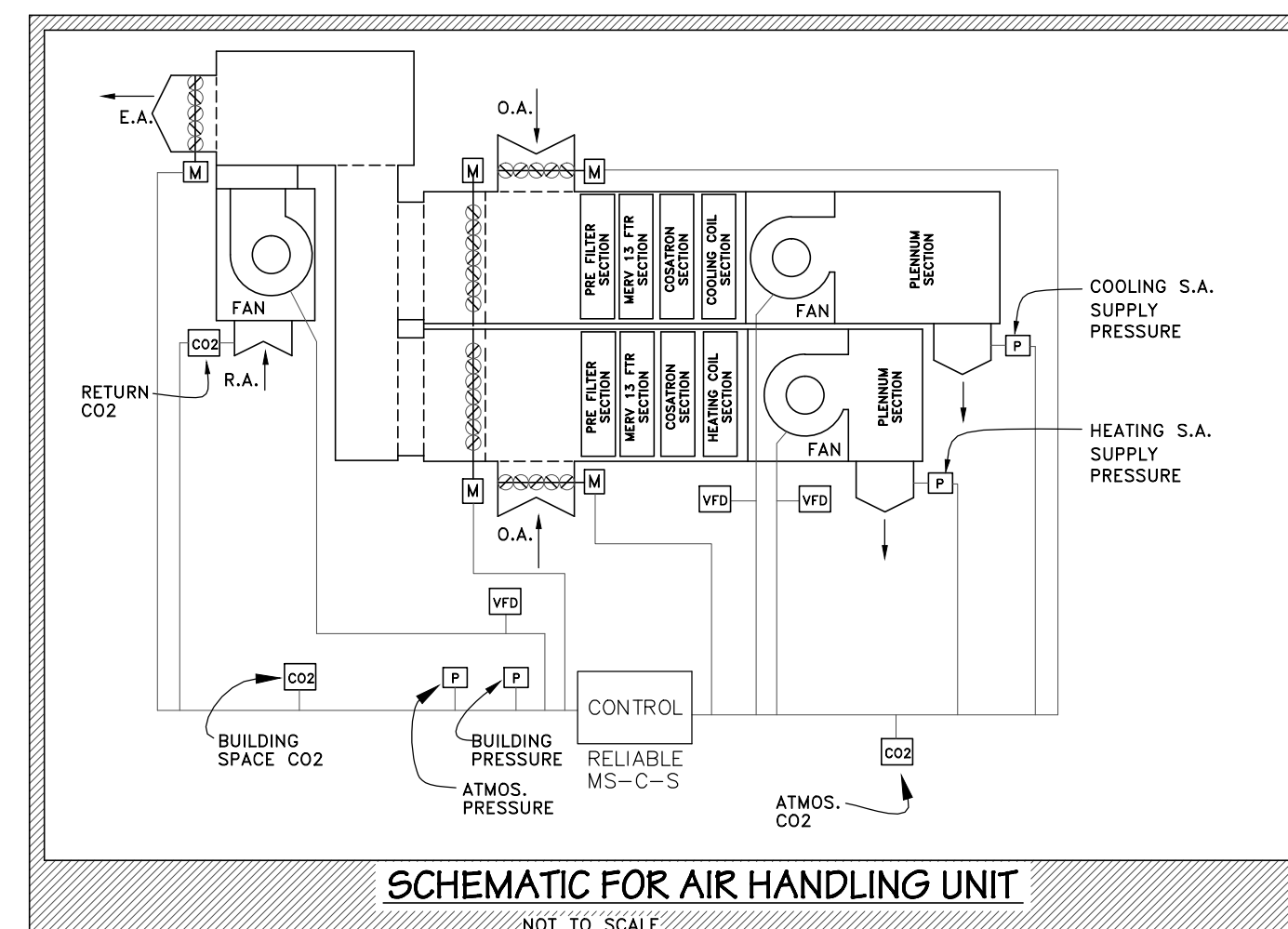
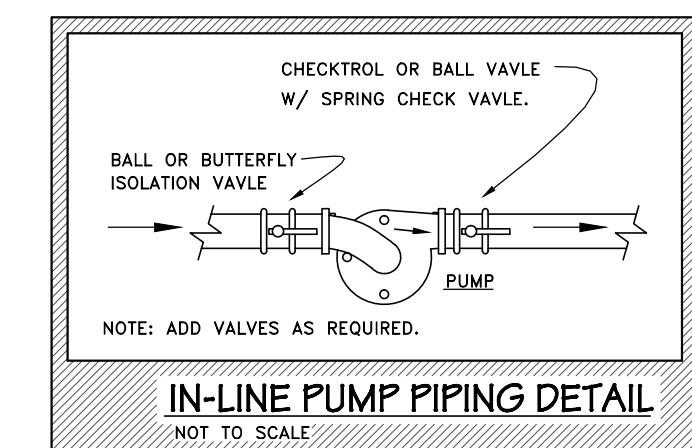
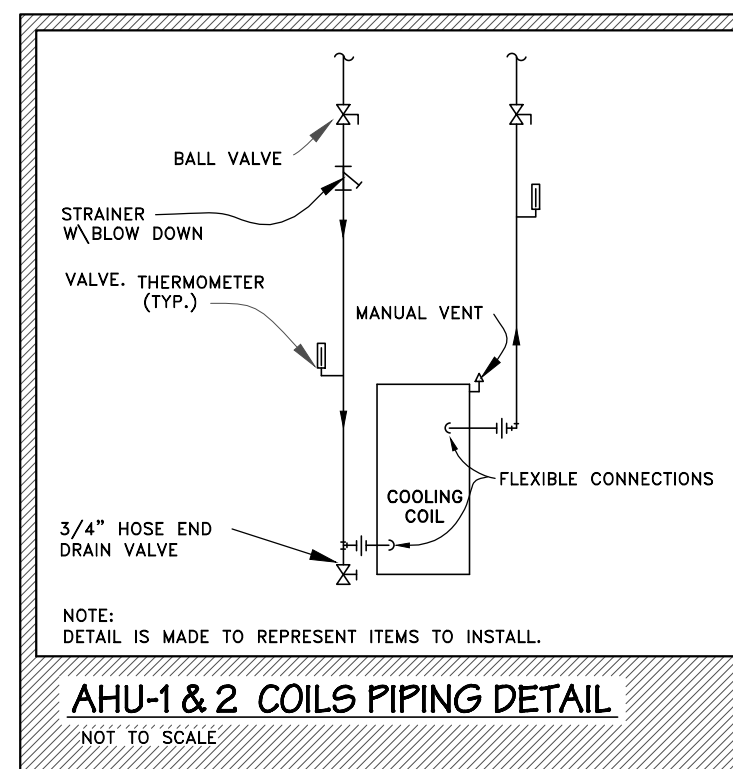
HYDRONIC HEATING/COOLING PIPING SCHEMATIC
NOT TO SCALE



PIPING/TUBING SIZING EQUIVALENT CHART

NOMINAL SIZE	COPPER PIPE FLOW RANGE (GPM)	STEEL TUBING FLOW RANGE (GPM)	PEX TUBING FLOW RANGE (GPM)	PE TUBING* FLOW RANGE (GPM)
1/2"	0.5-1.2	0.8-1.8	0.5-1.5	N/A
3/4"	2.5-3.5	1.7-4.0	1.5-4.0	1.8-4.5
1"	3.1-7.5	3.5-7.5	1.6-7.5	3.5-9.0
1 1/4"	5.5-13.0	7.0-16.0	7.5-13.0	7.0-14.0
1 1/2"	9.0-21.0	10.0-24.0	11.0-21.0	9.0-21.0
2"	20.0-45.0	20-47.0	15.0-32.0	19.0-65.0
2 1/2"	35.0-80.0	33.0-75.0	N/A	N/A
3"	65.0-130.0	60.0-140.0	N/A	65.0-130.0
4"	N/A	120.0-280.0	N/A	120.0-250.0
5"	N/A	220.0-510.0	N/A	N/A
6"	N/A	350.0-840.0	N/A	250.0-630.0
8"	N/A	850+	N/A	640-850

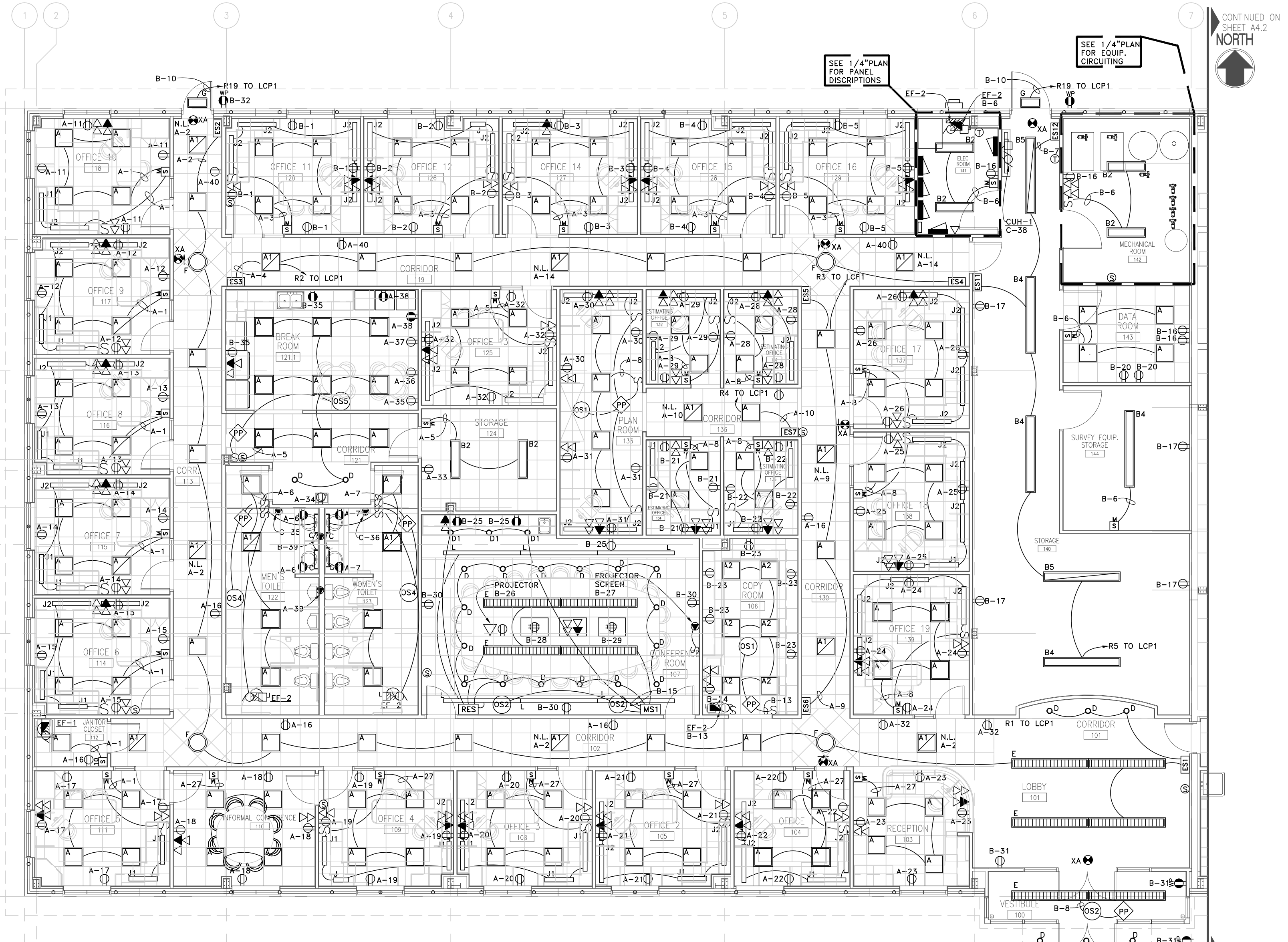
NOTES:
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* BASED ON HDPE 3408 & ASTM D3035 (GOOD ONLY FOR GEO EXCHANGE LOOP SYSTEMS).



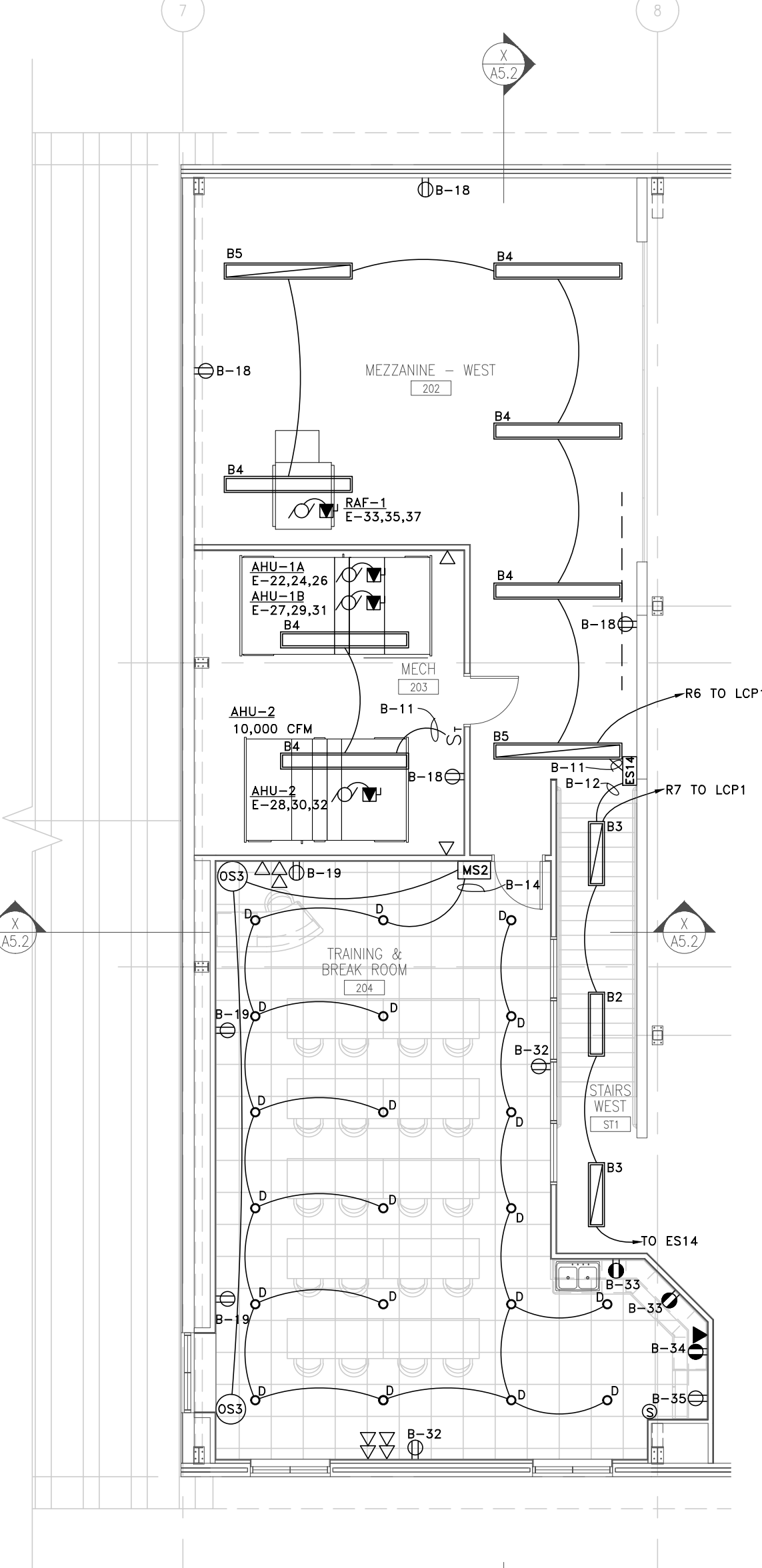
2012 PROJECT
FISHER CONTRACTING
 3401 CONTRACTOR DR.
 MIDLAND, MI 48640
 JOB NUMBER
E11-318
 PROJECT 1106-03
M3.1

ELECTRICAL NOTES

- PRIOR TO SUBMITTING A PROPOSAL, BIDDER SHALL HAVE VISITED THE CONSTRUCTION SITE. HE SHALL BE FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH HE WILL HAVE TO OPERATE AND WHICH WILL IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT. NO SUBSEQUENT ALLOWANCE WILL BE MADE IN THIS CONNECTION ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON HIS PART.
- ELECTRICAL WORK SHALL COMPLY WITH THE LATEST ENFORCEABLE EDITION OF THE N.E.C., LOCAL AND STATE CODES, ORDINANCES, REGULATIONS, INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), AND ADA GUIDELINES WITH THE LOCAL CODE AUTHORITIES HAVING JURISDICTION.
- ELECTRICAL CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL FEES, INCLUDING COSTS ASSESSED BY THE ELECTRIC UTILITY COMPANIES, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. AT THE COMPLETION OF ELECTRICAL WORK, THE ELECTRICAL CONTRACTOR SHALL FURNISH THE OWNER WITH ALL CERTIFICATES OF FINAL INSPECTION AND APPROVALS.
- ELECTRICAL MATERIALS SHALL BE NEW, AND BEAR THE "UL" LABEL.
- BRANCH CIRCUIT WIRE FOR LIGHTING, RECEPTACLE AND SMALL POWER SHALL BE COPPER, RATED 75 DEGREES C, MINIMUM SIZE #12 AWG, AND BE TYPE "THHN" AND BE INSTALLED IN EMT, UNLESS OTHERWISE NOTED OR REQUIRED BY CODE. FEEDERS AND SECONDARY SERVICE CONDUCTORS SHALL BE STRANDED COPPER WITH 600 VOLT INSULATION, RATED 90 DEGREES C, TYPE "THHN", AND BE INSTALLED IN EMT OR PVC CONDUIT, MINIMUM SIZE 1/2" UNLESS OTHERWISE NOTED OR REQUIRED BY CODE. ALL WIRE AND CABLE SHALL BE NEW AND SHALL BE DELIVERED TO PROJECT IN UNBROKEN AND UNMAGNIFIED CARTONS AND REELS.
- FUSES SHALL BE "UL" LISTED, DUAL AS MANUFACTURED BY BUSMAN CO., OR APPROVED EQUAL (200,000 ERIC).
- PLATES FOR SWITCHES AND RECEPTACLES SHALL BE BRUSHED SMOOTH STAINLESS STEEL.
- FLUORESCENT FIXTURE BALLAST VOLTAGE RATING SHALL BE AS NOTED, NON, HIGH POWER FACTOR, ENERGY SAVING, CLASS P, "A" SOUND RATED, HIGH DISCHARGE (HD) BALLAST SHALL BE NON, HIGH POWER FACTOR, CONSTANT WATTAGE AUTO TRANSFORMER TYPE, WITH STARTING CURRENT NOT EXCEEDING THE OPERATING CURRENT.
- PANEL BOARDS SHALL BE RATED 120/240V, 1 PHASE, 3W, AS NOTED WITH PLUG TYPE BRANCH CIRCUIT BREAKERS RATED A MINIMUM 10,000 A.I.C. PANEL BOARDS SHALL BE SIMILAR TO SQUARE D, TYPE QO AND I-LINE, OR EQUAL BY WESTINGHOUSE/CHALLENGER, E.T.A., OR GENERAL ELECTRIC.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT ELECTRIC UTILITY COMPANIES SERVICE POINTS AND PRIMARY SERVICE PLANNERS PRIOR TO BEGINNING WORK.
- ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED UNDER HIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER. SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AT NO EXPENSE TO CONTRACTOR.
- ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATIONS OF HIS EQUIPMENT AND WORK WITH OTHER BUILDING TRADES TO AVOID ANY INTERFERENCES BETWEEN HIS WORK AND THE WORK OF OTHER BUILDING TRADES. IF ANY DISCREPANCIES OCCUR, CONSULT WITH THE ARCHITECT AND/OR OWNER BEFORE CONTINUING.
- LAMPS - ALL LAMPS SHALL BE CLASSIFIED "ENERGY SAVING", AND BE PROVIDED BY E.C.
- THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR THE PROPER RESTORATION OF ALL EXISTING SURFACES REQUIRING PATCHING, PLASTERING, PAINTING AND/OR OTHER REPAIR DUE TO THE INSTALLATION OF ELECTRICAL WORK UNDER THE TERMS OF THIS SPECIFICATION. CLOSE ALL OPENINGS, REPAIR ALL SURFACES.
- THE ELECTRICAL CONTRACTOR SHALL PERIODICALLY REMOVE FROM THE SITE ALL DEBRIS AND RUBBISH ACCUMULATING AS A RESULT OF THE ELECTRICAL INSTALLATION. UPON COMPLETION OF THE PROJECT, HE SHALL DISPOSE OF ALL DEBRIS AND RUBBISH AND SHALL LEAVE ALL AREAS CLEAN. THE INTERIORS OF ALL CABINETS, PULL BOXES, AND EQUIPMENT ENCLOSURES SHALL BE FREE OF ANY DEBRIS.
- UNDERGROUND CONDUIT TO BE SCHEDULE 40 PVC.
- ELECTRICAL JOINTS WILL BE PERMITTED ONLY IN JUNCTION AND OUTLET BOXES. ALL JOINTS SHALL BE FIRMLY BONDED TOGETHER AND TAPED OR SHALL BE MADE WITH MECHANICAL CONNECTORS.



FLOOR PLAN - OFFICE
 SCALE: 1/8" = 1'-0" FIRST FLOOR SQ.FT. - 7,405
 TOTAL SQ.FT. - 26,490

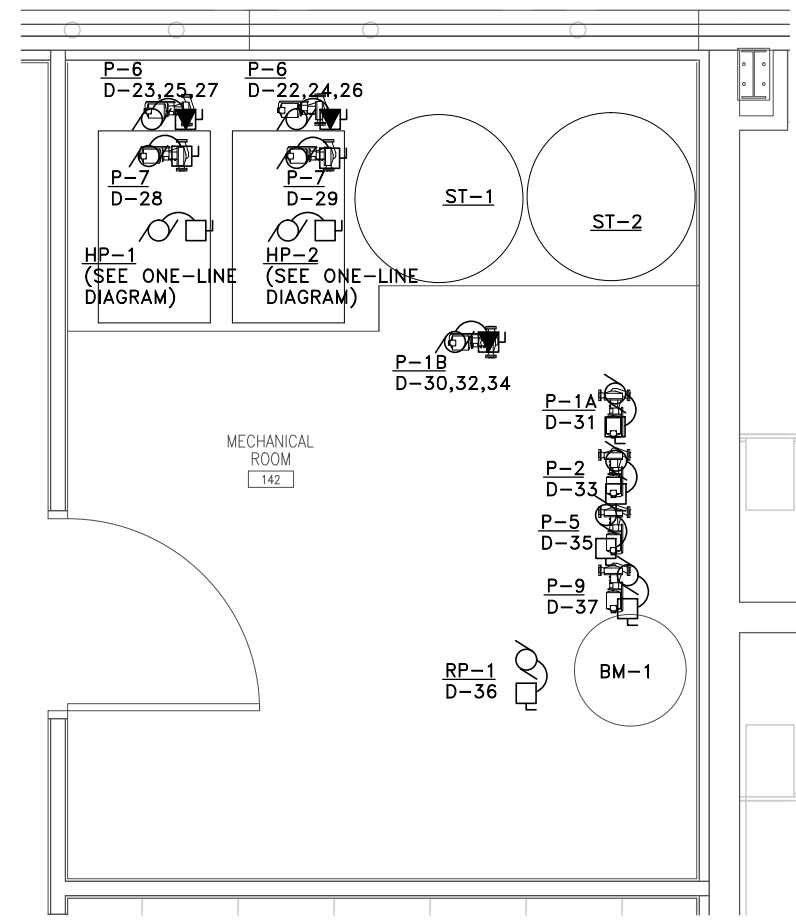


FLOOR PLAN - MEZZANINE (WEST)
 SCALE: 1/8" = 1'-0" MEZZANINE (WEST) SQ.FT. - 2,345
 TOTAL SQ.FT. - 26,490

ELECTRICAL SYMBOL LEGEND		
SYMBOL	DESCRIPTION	NOTES
S	SINGLE POLE SWITCH	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
S ₃	THREE WAY SWITCH	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
X	2"x2" FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	CAN FIXTURE	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	1"x4" FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	EXIT SIGN, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
D	DUPLEX OUTLET - 20 AMP	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
D	DUPLEX OUTLET - GROUND FAULT	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
D	DUPLEX OUTLET - WEATHER PROOF COVER	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
D	SPECIAL PURPOSE OUTLET, AS NOTED	REFER TO SHOP DRAWINGS FOR CONNECTION REQUIREMENTS
M	MOTOR, AS SPECIFIED	REFERENCE SPECIFICATIONS FOR REQUIREMENTS
F	FUSED DISCONNECT	REFER TO GENERAL ELECTRICAL NOTES AND ONE-LINE DIAGRAM.
F	STARTER/DISCONNECT	REFERENCE SPECIFICATIONS FOR REQUIREMENTS
F	FUSED DISCONNECT FOR VFD CONNECTION	PROVIDE ALL LINE VOLTAGE WIRING AND CONDUIT FOR VFD INSTALL. (CONTROLS CONTRACTOR WILL PROVIDE VFD UNIT.)
P	LIGHTING/BRANCH CIRCUIT PANELS	REFER TO GENERAL ELECTRICAL NOTES AND ONE-LINE DIAGRAM.
DA	DATA OUTLET	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED, EC TO PROVIDE SINGLE GANG BOX WITH 1" C STUBBED IN ATTIC SPACE.
VO	VOIP OUTLET	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED, EC TO PROVIDE SINGLE GANG BOX WITH 1" C STUBBED IN ATTIC SPACE.
T	MECHANICAL THERMOSTAT	PROVIDE CONDUIT AND BACKBOX
S	MECHANICAL SENSOR	PROVIDE CONDUIT AND BACKBOX

OCCUPANCY LEGEND			
SYMBOL	BRAND	MODEL #	DESCRIPTION
[S]	LEVITON	OSSMT-MDW	WALLBOX MOUNTED MULTI-TECHNOLOGY OCCUPANCY SENSOR
[S]	LEVITON	ODS10-IDW	WALLBOX MOUNTED PIR OCCUPANCY SENSOR
[OS1]	LEVITON	OS10-MOW	CEILING MOUNTED MULTI-TECHNOLOGY OCCUPANCY SENSOR (1000 SQ. FT)
[OS2]	LEVITON	OS10-MOW	CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR (500 SQ. FT)
[OS3]	LEVITON	OSW12-MOW	WALL/CORNER MTD. MULTI-TECHNOLOGY OCCUPANCY SENSOR (1200 SQ. FT)
[OS4]	LEVITON	OS10-MOW	CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR (2000 SQ. FT)
[OS5]	LEVITON	OS10-MOW	CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR (2000 SQ. FT)
[PP]	LEVITON	OSP20-000	POWER PACK FOR 120VAC SYSTEM

WIRE SIZE REQUIREMENTS									
NOTE: BASED ON A MAXIMUM OF 6-VOLT DROP (5%) ON 120V CIRCUITS. WIRES FOR RUNS OVER 100'-0" SHALL BE DETERMINED ON THIS A MAXIMUM OF A 5% DROP ALLOWED.									
BRANCH CIRCUIT AMPS	LENGTH OF RUN - FROM PANEL TO FIRST CONNECTION - FEET								
15	#12	#12	#12	#12	#12	#12	#10	#10	#10
20	#12	#12	#12	#12	#12	#12	#10	#10	#8
30	#10	#10	#10	#10	#8	#8	#8	#8	#6



ELECT. ROOM - ELCT.
 SCALE: 1/4" = 1'-0"



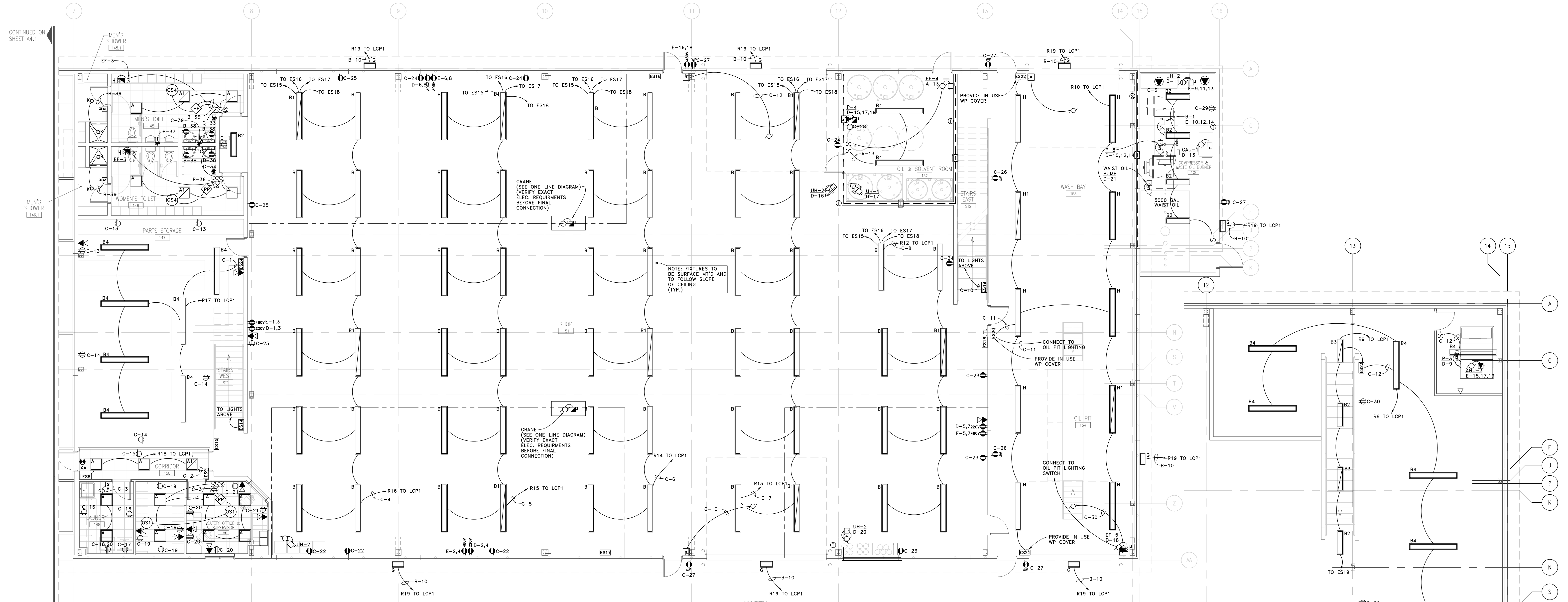
MECH. ROOM - ELCT.
 SCALE: 1/4" = 1'-0"

OCCUPANCY NOTES

- ALL SENSOR LOCATIONS ARE APPROXIMATE-REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND AIM SENSORS IN THE CORRECT LOCATION REQUIRED FOR COMPLETE AND PROPER VOLUMETRIC COVERAGE WITHIN THE RANGE OF COVERAGE(S) OF CONTROLLED AREAS PER THE MANUFACTURER'S RECOMMENDATIONS. ROOMS SHALL HAVE COVERAGE TO COMPLETELY COVER THE CONTROLLED AREA TO ACCOMMODATE ALL OCCUPANCY HABITS OF SINGLE OR MULTIPLE OCCUPANTS AT ANY LOCATION WITHIN THE ROOM(S). THE LOCATIONS AND QUANTITIES OF SENSORS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE ONLY THE ROOMS WHICH ARE TO BE PROVIDED WITH SENSORS. THE CONTRACTOR SHALL PROVIDE ADDITIONAL SENSORS IF REQUIRED TO PROPERLY AND COMPLETELY COVER THE RESPECTIVE ROOM.
- ULTRASONIC CEILING MOUNT SENSORS SHOULD BE LOCATED A MINIMUM OF SIX FEET FROM HVAC SUPPLY/RETURN VENTS.
- CONTRACTOR IS RESPONSIBLE FOR PROPER SENSITIVITY AND TIME DELAY SETTINGS (FOR NON-ADAPTIVE PRODUCTS) MANUFACTURER'S RECOMMENDED PLACEMENT, AND FIELD VERIFICATION OF CIRCUITS WITH RESPECT TO POWER PACK PLACEMENT.
- CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF REQUIRED NUMBER OF POWER PACKS: A) ONE POWER PACK IS REQUIRED FOR EACH CIRCUIT THAT IS TO BE CONTROLLED; B) DEPENDING ON THE TYPE OF SENSOR, UP TO THREE SENSORS CAN BE WIRED IN PARALLEL TO A SINGLE POWER PACK; C) IF MULTIPLE CIRCUITS ARE TO BE CONTROLLED BY A SENSOR, AUXILIARY RELAYS MAY BE USED IN CONJUNCTION WITH A POWER PACK.
- SENSORS MOUNTED OVER DOORWAYS SHOULD BE PLACED ONE FOOT INSIDE THRESHOLD.

FISHER CONTRACTING

JOB NUMBER
E11-318



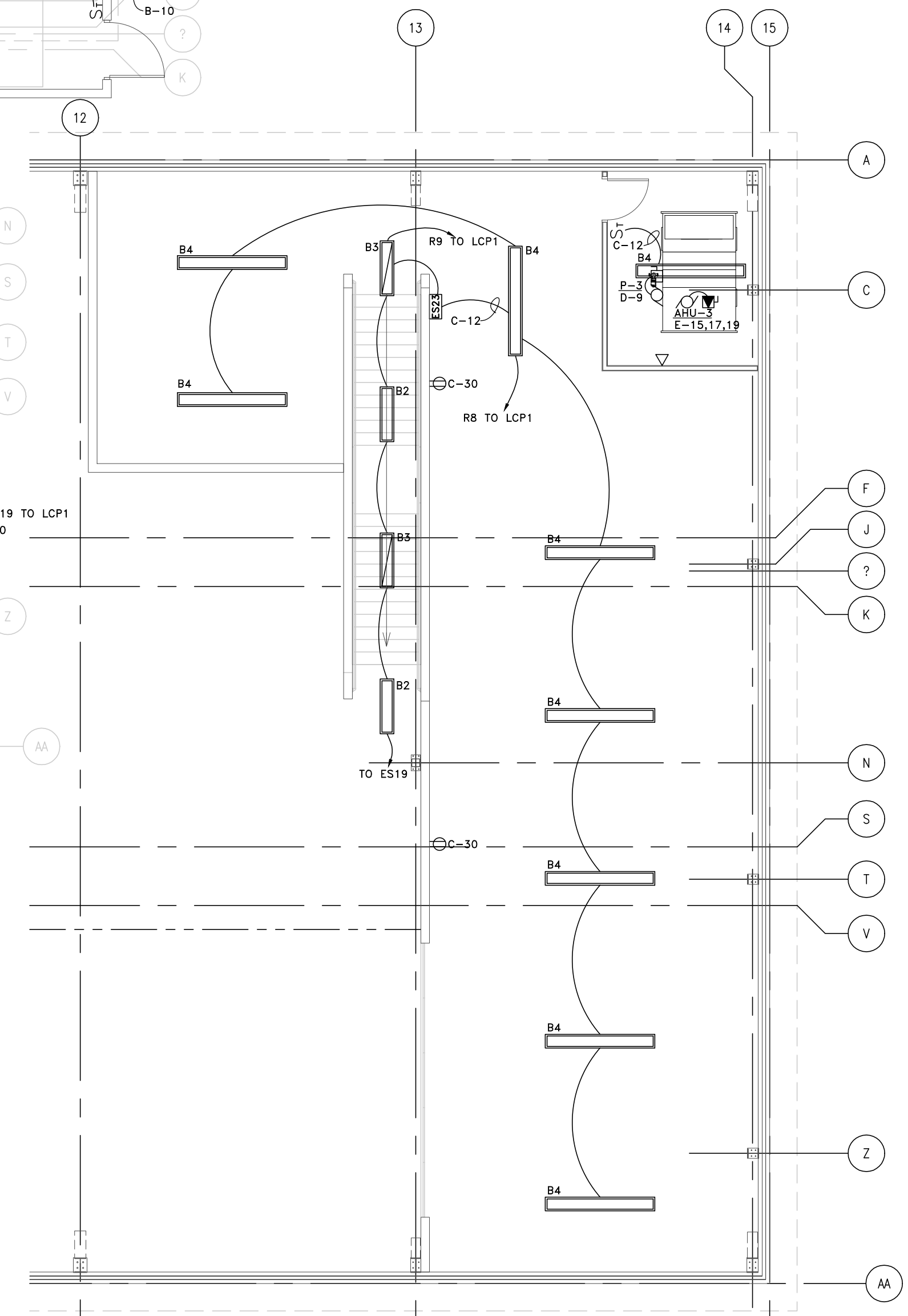
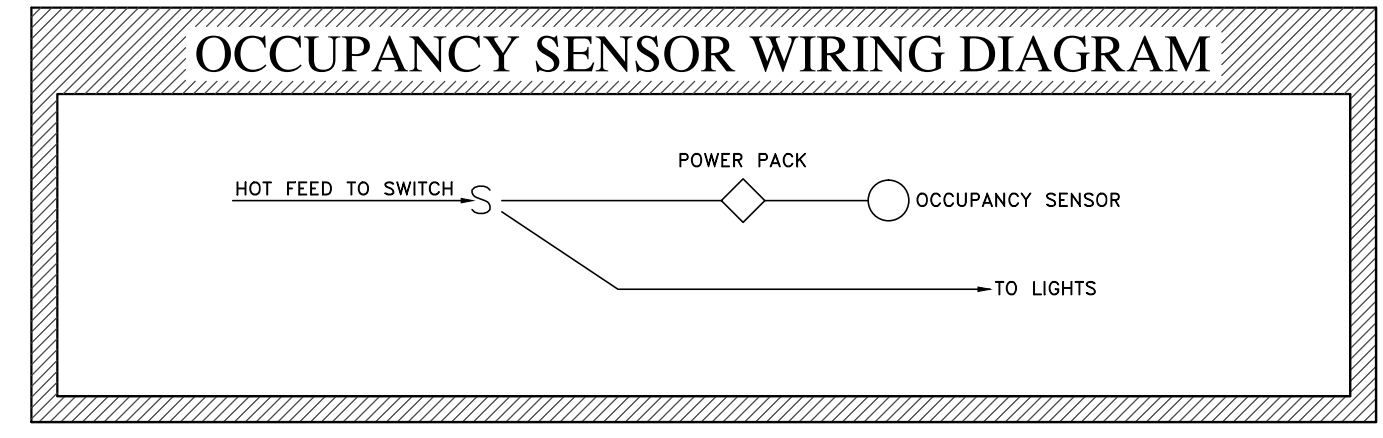
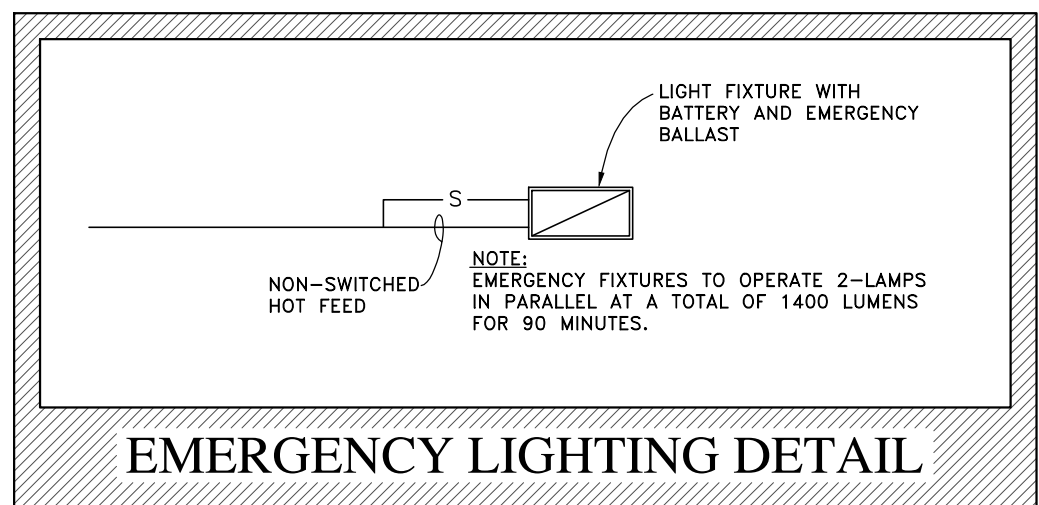
FLOOR PLAN - SHOP (FIRST FLOOR)

SCALE: 1/8" = 1'-0" FIRST FLOOR SQ.FT. = 7,405 TOTAL SQ.FT. = 26,490



LIGHTING FIXTURE SCHEDULE

TYPE	BRAND	MODEL #	MOUNTING TYPE	LAMP	TOTAL FIXTURE POWER	VOLTAGE	NOTES:
A	METALUX	2AC-217-UNV-ER81-U	RECESSED	(2) F17/T8/35K	35W	UNV	
A1	METALUX	2AC-217-120-EL-FBP240H-ER81-U	RECESSED	(2) F17/T8/35K	35W	120V	W/ 1400 LUMEN EMERGENCY BATTERY
B	METALUX	81B-232-TBW-UNV-ER81-U	SUSPENDED	(4) F32/T8/35K	120W	UNV	
B1	METALUX	81B-232-TBW-120V-EL-FBP240H-ER81/PLUS	SUSPENDED	(4) F32/T8/35K	120W	120V	W/ 1400 LUMEN EMERGENCY BATTERY
B2	METALUX	IAF-232-UNV-ER81-U-WG/ICF-4FT-U	SUSPENDED	(2) F32/T8/35K	60W	UNV	
B3	METALUX	IAF-232-120V-EL-FBP240H-ER81-U-WG/ICF-4FT-U	SUSPENDED	(2) F32/T8/35K	60W	120V	W/ 1400 LUMEN EMERGENCY BATTERY
B4	METALUX	81AF-232-UNV-ER81-U-WG/ICF-4FT-U	SURFACED	(2) F32/T8/35K	120W	UNV	
B5	METALUX	81AF-232-120V-EL-FBP240H-ER81-U-WG/ICF-4FT-U	SURFACED	(2) F32/T8/35K	120W	120V	W/ 1400 LUMEN EMERGENCY BATTERY
C	METALUX	BAU-217-UNV-ER81-WH-U	WALL MTD.	(2) F17/T8/35K	35W	UNV	
D	HALO	H750ICAT-ML709B35-493HS06-120V	RECESSED	LED/900LM/40K	15W	120V	
E	CORELITE	E2-WH-2T8-1C-UNV-AC48-T1-16'	SUSPENDED	(4) F32/T8/35K	240W	UNV	
F	TERON	NEC18-226Q-120E	SURFACE	(2) F26/QUAD	52W	UNV	
G	MICRAW	15C-B01-LED-E1-BL3-BK-LCF	WALL MTD.	LED/1770LM/40K	27W	120V	
H	METALUX	81V13-232DR-UNV-ER81/PLUS-WL-U	SUSPENDED	(4) F32/T8/35K	120W	UNV	
I	LDOI	380-T8-2L-4-120	SUSPENDED	(2) F32/T8/35K	120W	UNV	W/ #4401 WALL MT. KIT
J	METALUX	CL-117-UNV-ER81-U	SURFACED	(1) F17/T8/35K	17W	UNV	
J1	METALUX	CL-125-UNV-ER81-U	SURFACED	(1) F25/T8/35K	25W	UNV	
J2	METALUX	CL-132-UNV-ER81-U	SURFACED	(1) F32/T8/35K	34W	UNV	
K	KIRLIN	LRB-05010	SURFACED	(1) 20W LED	20W	UNV	
L	SPI	EIV10145-2F32T8 (8' LONG)	SURFACED	(2) F32/T8/35K	20W	UNV	
XA	SURELITES	APX7R	SURFACE	LED	3W	120V	



FLOOR PLAN - MEZZANINE (EAST)

SCALE: 1/8" = 1'-0" MEZZANINE (EAST) SQ.FT. = 2,345 TOTAL SQ.FT. = 26,490

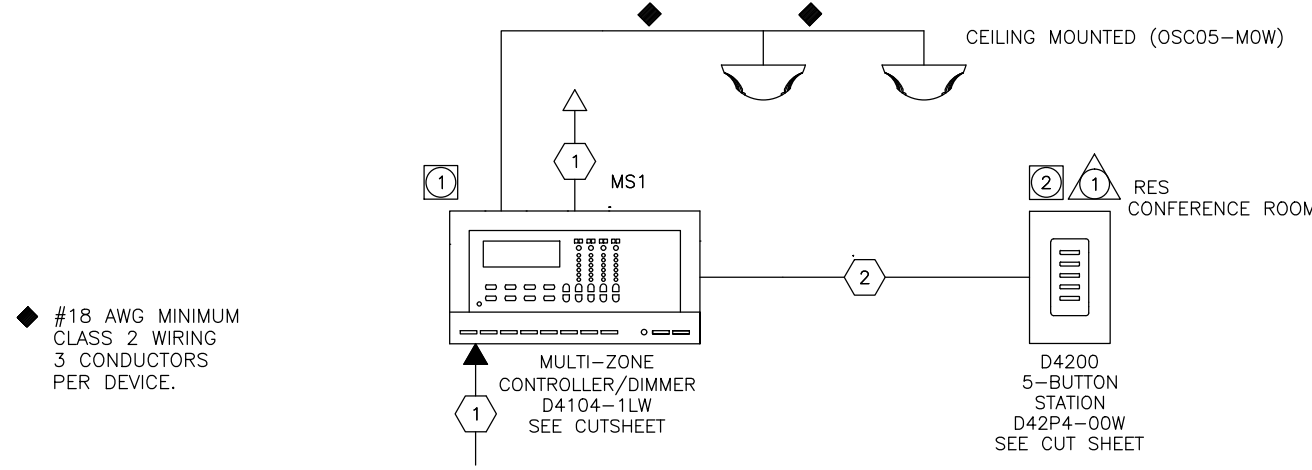


FLOOR PLAN - OIL PIT

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

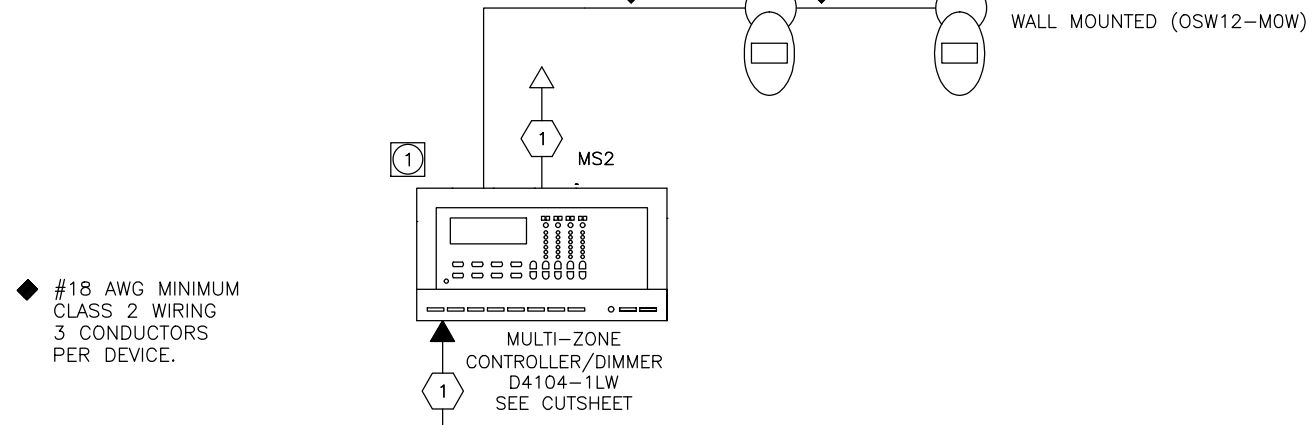


2009 PROJECT FLOOR: FISHER CONTRACTING
 JOB NUMBER: E11-318



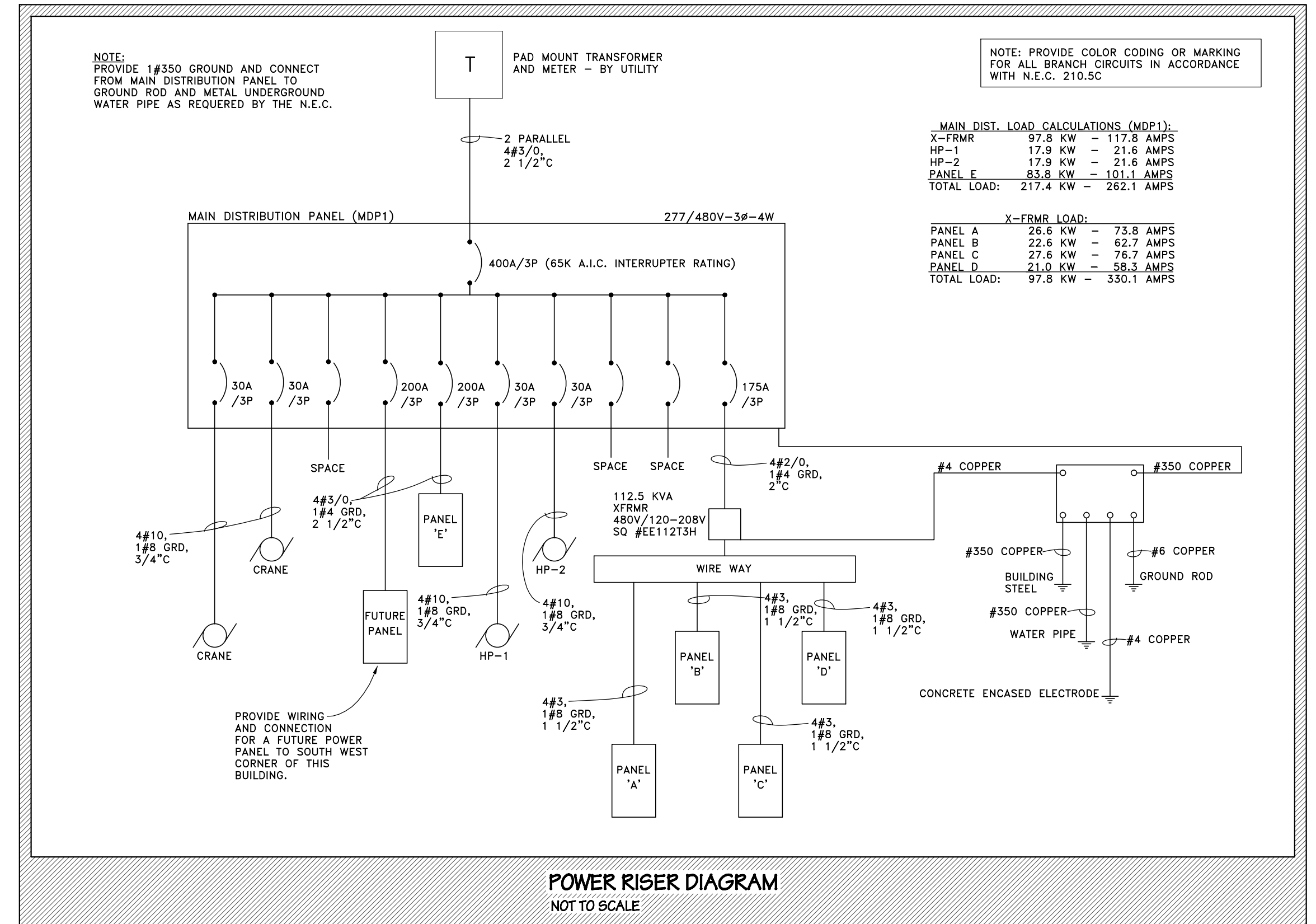
MS1 (CONFERENCE ROOM) D4104

CUSTOMER_CKT	ZONE	POWER EXTENDER	DIMMER	LOAD TYPE	LOAD	DESCRIPTION
A6	1	-	NON	FLUORESCENT NON-DIM	256	TYPE-E LINEAR FLUOR.
A6	2	-	INC	LED STANDARD 120V DIMMING	180	TYPE-D PERIMETER DOWNLIGHT
A6	3	-	INC	LED STANDARD 120V DIMMING	45	TYPE-D COUNTER DOWNLIGHT
A6	4	-	-	-	-	-



MS2 (CONFERENCE / BREAK ROOM) D4104

CUSTOMER_CKT	ZONE	POWER EXTENDER	DIMMER	LOAD TYPE	LOAD	DESCRIPTION
A4	2	-	INC	FLUORESCENT NON-DIM	240	TYPE-E LINEAR FLUORESCENT
A4	3	-	-	LED STANDARD 120V DIMMING	-	TYPE-D DOWNLIGHTS
A4	4	-	-	-	-	-



NOTE: PROVIDE COLOR CODING OR MARKING FOR ALL BRANCH CIRCUITS IN ACCORDANCE WITH N.E.C. 210.5C

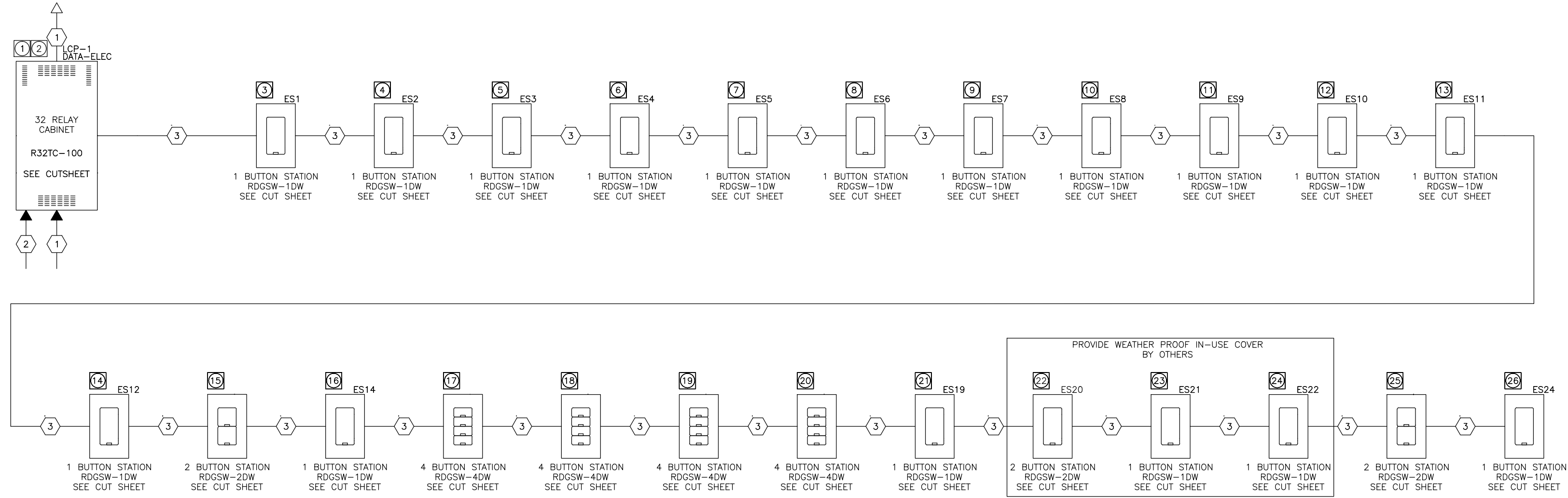
MAIN DIST. LOAD CALCULATIONS (MDP1):

X-FRMR	97.8 KW	=	117.8 AMPS
HP-1	17.9 KW	=	21.6 AMPS
HP-2	17.9 KW	=	21.6 AMPS
PANEL E	85.8 KW	=	101.1 AMPS
TOTAL LOAD:	219.4 KW	=	262.1 AMPS

X-FRMR LOAD:

PANEL A	26.6 KW	=	73.8 AMPS
PANEL B	22.6 KW	=	62.7 AMPS
PANEL C	27.6 KW	=	76.7 AMPS
PANEL D	21.0 KW	=	58.3 AMPS
TOTAL LOAD:	97.8 KW	=	330.1 AMPS

POWER RISER DIAGRAM
NOT TO SCALE



LCP-1

CIRCUIT SCHEDULE R32TC-100

NUMBER	EM POWER Y/N	VOLTAGE	LOAD TYPE	CIRCUIT	LOAD	UNIT	TYPE	DESCRIPTION
1		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	CORRIDOR 2X2 LIGHTING
2		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	CORRIDOR 2X2 LIGHTING
3		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	CORRIDOR 2X2 LIGHTING
4		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	CORRIDOR 2X2 LIGHTING
5		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	STORAGE LIGHTING
6		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	MEZZANINE WEST LIGHTING
7		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	MEZZANINE WEST STAIRS LIGHTING
8		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	MEZZANINE EAST LIGHTING
9		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	MEZZANINE EAST STAIRS LIGHTING
10		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	WASH BAY LIGHTING
11		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SHOP LIGHTING
12		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SHOP LIGHTING
13		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SHOP LIGHTING
14		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SHOP LIGHTING
15		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SHOP LIGHTING
16		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SHOP LIGHTING
17		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	PARTS STORAGE LIGHTING
18		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	CORRIDOR 2X2 LIGHTING
19		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	TYPE-G EXTERIOR LIGHTING
20		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	EXTERIOR ENTRY SOFFIT LIGHTING
21		277V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SITE
22		277V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SITE
23		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SPARE
24		120V	FLUORESCENT BALLAST	A2	2400	W/VA	1TB	SPARE
25		-	-	-	-	-	-	BFM
26		-	-	-	-	-	-	BFM
27		-	-	-	-	-	-	BFM
28		-	-	-	-	-	-	BFM
29		-	-	-	-	-	-	BFM
30		-	-	-	-	-	-	BFM
31		-	-	-	-	-	-	BFM
32		-	-	-	-	-	-	BFM

LUMA-CAN CABLE WIRING CHART FOR "LC" CABLE RUNS, Belden #1872A ENHANCED CAT. 6, 4 TWISTED PAIR

WIRE COLOR CODE	PIN NO.	FUNCTION
ORANGE	2	CANL
WHITE/ORANGE STRIPE	1	CANR
ORANGE	2	CANL
WHITE/GREEN STRIPE	3	COM
BLUE	4	-
WHITE/BLUE STRIPE	5	-
GREEN	6	+V
WHITE/BROWN STRIPE	7	-
BROWN	8	-

SYMBOLS

- POWER LOAD BY INSTALLER
- POWER FEED BY INSTALLER
- WIRE RUNS NOT BY LEVITON
- REFERENCE TO NOTES, DOES NOT TRANSCEND DRAWINGS.
- DEVICE ADDRESS
- DEVICE SLAVE ADDRESS

SIGNAL PROTOCOLS AND MAXIMUM RUN LENGTHS INCLUDING PORTABLE DEVICE CABLES (WHEN APPLICABLE). SEE CHARTS FOR CABLE TYPE AND TERMINATION INFORMATION.

PROTOCOL	MAX LENGTH	CONNECTION TOPOLOGY	USDN
LUMA-NET	2000 FT	BUS NETWORK (NO DROPS)	1
LUMACAN	1600 FT	DAISY-CHAIN	1
DMX	1000 FT	1	1
ANALOG	1000 FT	DAISY-CHAIN / HOMERUN	1
US	1640 FT	DAISY-CHAIN	1

* AS SHOWN AND AS NOTED ON SYSTEM BLOCK DIAGRAM(S). ** REFER TO THE SYSTEM BLOCK DIAGRAM(S). USN = UNLESS OTHERWISE NOTED.

RELAY PANEL DETAIL
NOT TO SCALE

PANEL A 100 AMPS M.C.B. 120/208V-3P-4W

CR NO.	AMP/POLES	DESCRIPTION	LOAD	LOAD	DESCRIPTION	AMP/POLES	CR NO.
1	20/1	LIGHTS (OFFICES)	400	600	LIGHTS (CORRIDOR 113)	20/1	2
3	20/1	LIGHTS (OFFICES)	700	600	LIGHTS (CORRIDOR 20/1)	4	4
5	20/1	LIGHTS (BREAK ROOM)	700	400	LIGHTS & REC. (MEN'S 122)	20/1	6
7	20/1	LIGHTING (WOMEN'S 123)	400	500	LIGHTS (EST. OFFICES)	20/1	8
9	20/1	LIGHTS (CORRIDOR 130)	700	200	RECEPTACLES (OFFICE 130)	20/1	10
11	20/1	RECEPTACLES (OFFICE 118)	800	800	RECEPTACLES (OFFICE 117)	20/1	12
13	20/1	RECEPTACLES (OFFICE 116)	800	800	RECEPTACLES (OFFICE 115)	20/1	14
15	20/1	RECEPTACLES (OFFICE 114)	800	800	RECEPTACLES (CORRIDORS)	20/1	16
17	20/1	RECEPTACLES (OFFICE 111)	800	800	RECEPTACLES (CONFERENCE 110)	20/1	18
19	20/1	RECEPTACLES (OFFICE 104)	800	800	RECEPTACLES (OFFICE 103)	20/1	20
21	20/1	RECEPTACLES (OFFICE 105)	800	800	RECEPTACLES (OFFICE 104)	20/1	22
23	20/1	RECEPTACLES (OFFICE 103)	800	800	RECEPTACLES (OFFICE 135)	20/1	24
25	20/1	RECEPTACLES (OFFICE 138)	800	800	RECEPTACLES (OFFICE 137)	20/1	26
27	20/1	LIGHTS (OFFICES)	700	800	RECEPTACLES (EST. OFFICE 131)	20/1	28
29	20/1	RECEPTACLES (EST. OFFICE 132)	800	800	RECEPTACLES (OFFICE 115)	20/1	30
31	20/1	RECEPTACLES (PLAN RM. 133)	600	600	RECEPTACLES (PLAN ROOM 153)	20/1	32
33	20/1	RECEPTACLES (STORAGE 124)	200	500	EW-1 (CORRIDOR 121)	20/1	34
35	20/1	VENDING (BREAK ROOM 121.1)	1000	1000	VENDING (BREAK ROOM 121.1)	20/1	36
37	20/1	REFRIGERATOR (BREAK ROOM 121.1)	1000	600	RECEPTACLES (BREAK ROOM 121.1)	20/1	38
39	20/1	POWER CONVERTER (MENS)	500	---	SPARE	20/1	40
41	20/1	SPARE	---	---	SPACE	---	42

PANEL B 100 AMPS M.C.B. 120/208V-3P-4W

CR NO.	AMP/POLES	DESCRIPTION	LOAD	LOAD	DESCRIPTION	AMP/POLES	CR NO.
1	20/1	RECEPTACLES (OFFICE 120)	800	800	RECEPTACLES (OFFICE 126)	20/1	2
3	20/1	RECEPTACLES (OFFICE 127)	700	800	RECEPTACLES (OFFICE 120)	20/1	4
5	20/1	RECEPTACLES (OFFICE 129)	800	700	LIGHTS (MECH/ELECT)	20/1	6
7	20/1	LIGHTS (STORAGE 140)	700	400	LIGHTS (VEST. 100)	20/1	8
9	20/1	LIGHTS (CORRIDOR 130)	700	600	LIGHTS (EXTERIOR)	20/1	10
11	20/1	LIGHTS (MEZZ 202)	800	200	LIGHTS (STAIR ST)	20/1	12
13	20/1	LIGHTS (OFFICES)	600	500	LIGHTS (TRAINING 204)	20/1	14
15	20/1	LIGHTS (CONFERENCE 107)	600	400	RECEPTACLES (DATA 143)	20/1	16
17	20/1	RECEPTACLES (STORAGE 140)	800	400	RECEPTACLES (MEZZ 202)	20/1	18
19	20/1	RECEPTACLES (TRAINING 204)	600	400	RECEPTACLES (DATA 143)	20/1	20
21	20/1	RECEPTACLES (EST. OFFICE 131)	800	800	RECEPTACLES (EST. OFFICE 135)	20/1	22
23	20/1	RECEPTACLES (COPY 108)	900	1000	COPY MACH. (COPY 106)	20/1	24
25	20/1	RECEPTACLES (CONFERENCE 107)	600	1000	PROJECTOR (CONFERENCE 107)	20/1	26
27	20/1	PROD. SCREEN (CONFERENCE 107)	500	400	RECEPTACLES (CONFERENCE 107)	20/1	28
29	20/1	RECEPTACLES (CONFERENCE 107)	400	600	RECEPTACLES (CONFERENCE 107)	20/1	30
31	20/1	RECEPTACLES (EXTERIOR)	600	400	RECEPTACLES (CONFERENCE 107)	20/1	32
33	20/1	RECEPTACLES (TRAINING 204)	400	200	RECEPTACLES (TRAINING 204)	20/1	34
35	20/1	LIGHTS (BREAK ROOM 121)	400	600	LIGHTS (SHOP 150)	20/1	36
37	20/1	POWER CONVERTER (MEN 143)	500	800	RECEPTACLES (MEN/WOMEN)	20/1	38
39	20/1	POWER CONVERTER (MEN/WOMEN)	500	---	SPARE	20/1	40
41	---	SPACE	---	---	SPACE	---	42

PANEL C 100 AMPS M.C.B. 120/208V-3P-4W

CR NO.	AMP/POLES	DESCRIPTION	LOAD	LOAD	DESCRIPTION	AMP/POLES	CR NO.
1	20/1	EW-1 (SHOP 151)	500	200	LIGHTS (CORRIDOR 148)	20/1	2
3	20/1	LIGHTS (LAUNDRY/OFFICE)	400	1400	LIGHTS (SHOP 150)	20/1	4
5	20/1	LIGHTS (SHOP 151)	1400	1400	LIGHTS (SHOP 150)	20/1	6
7	20/1	LIGHTS (SHOP 151)	1400	1400	LIGHTS (SHOP 150)	20/1	8
9	20/1	SPARE	---	1000	GARAGE DOOR (SHOP 150)	20/1	10
11	20/1	LIGHTS (WASH 153)	1500	1000	GARAGE DOOR (SHOP 150)	20/1	12
13	20/1	RECEPTACLES (PARTS 147)	600	600	RECEPTACLES (PARTS 145)	20/1	14
15	20/1	RECEPTACLES (CORRIDOR 150)	200	400	RECEPTACLES (LAUNDRY 148)	20/1	16
17	20/1	WASHER (LAUNDRY 148)	1000	2000	DRYER (LAUNDRY 148)	30/2	18
19	20/1	RECEPTACLES (S. OFFICE 149)	900	2000	---	---	20
21	20/1	RECEPTACLES (S. OFFICE 149)	400	600	RECEPTACLES (SHOP 151)	20/1	22
23	20/1	RECEPTACLES (SHOP 151)	600	600	RECEPTACLES (SHOP 151)	20/1	24
25	20/1	RECEPTACLES (SHOP 151)	600	600	RECEPTACLES (WASH 153)	20/1	26
27	20/1	RECEPTACLES (EXTERIOR)	600	200	RECEPTACLES (OIL PIT 154)	20/1	28
29	20/1	RECEPTACLES (COMP. 155)	200	1000	GARAGE DOOR (SHOP 151)	20/1	30
31	20/1	POWER WASHER (COMP. 155)	1000	400	RECEPTACLES (CORRIDORS)	20/1	32
33	20/1	HAND DRYER (MEN 145)	1000	1000	HAND DRYER (WOMEN'S 146)	20/1	34
35	20/1	HAND DRYER (MEN 122)	1000	1000	HAND DRYER (WOMEN'S 123)	20/1	36
37	20/1	RECEPTACLES (OIL PIT 154)	400	400	CUH-1 (STORAGE 140)	20/1	38
39	20/1	POWER CONVERTER (MEN/WOMEN)	500	---	SPARE	20/1	40
41	---	SPACE	---	---	SPACE	---	42

PANEL D 100 AMPS M.C.B. 120/208V-3P-4W

CR NO.	AMP/POLES	DESCRIPTION	LOAD	LOAD	DESCRIPTION	AMP/POLES	CR NO.
1	20/2	220V-RECEPTACLE (SHOP 151)	1000	1000	220V-RECEPTACLES (SHOP 151)	20/2	2
3	20/2	220V-RECEPTACLE (SHOP 151)	1000	1000	220V-RECEPTACLES (SHOP 151)	20/2	4
5	20/2	220V-RECEPTACLE (SHOP 151)	1000	1000	220V-RECEPTACLES (SHOP 151)	20/2	6
7	20/1	P-3 (MEZZ. MECH.)	1000	1000	---	---	8
9	15/1	P-3 (MEZZ. MECH.)	400	500	---	---	10
11	20/1	UH-2 (COMP. 155)	1000	500	P-8 (COMP. 155)	20/1	12
13	20/1	CAU-1 (COMP. 155)	1800	500	---	---	14
15	20/1	UH-2 (SHOP 151)	400	1000	UH-2 (SHOP 151)	20/1	16
17	20/3	P-3 (SHOP 151)	400	400	EF-3 (OIL PIT 154)	15/1	18
19	20/1	UH-2 (SHOP 151)	400	1000	UH-2 (SHOP 151)	20/1	20
21	15/1	WASTE OIL PUMP (COMP. 155)	400	300	---	---	22
23	20/1	P-6 (MECH 142)	300	300	P-6 (MECH 142)	20/1	24
25	20/3	P-6 (MECH 142)	300	300	P-7 (MECH 142)	15/1	26
27	20/1	P-7 (MECH 142)	300	400	P-7 (MECH 142)	15/1	28
29	15/1	P-7 (MECH 142)	400	400	P-8 (MECH 142)	20/1	30
31	15/1	P-1A (MECH 142)	400	400	P-1B (MECH 142)	20/1	32
33	15/1	P-2 (MECH 142)	400	400	---	---	34
35	15/1	P-5 (MECH 142)	400	200	RP-1 (MECH 142)	20/1	36
37	15/1	P-9 (MECH 142)	400	400	SP-1 (OIL PIT 154)	15/1	38
39	20/1	SPARE	---	---	SPACE	---	40
41	---	SPACE	---	---	SPACE	---	42