

TACOMA PLUMBING & HEATING, INC.
 DESIGN BUILD
 • COMMERCIAL
 • INDUSTRIAL
 • UTILITIES
 • SERVICE
 1817 112TH STREET EAST
 SUITE G
 TACOMA, WA. 98445
 OFFICE 253-531-3444
 FAX 253-537-0382
 INFO@TACOMAPLUMBING.COM
 WWW.TACOMAPLUMBING.COM

STEP BY STEP
 GATEWAY
 BUILDING
 303 #A 8TH
 AVENUE SE
 PUYALLUP, WA

LEGEND,
 ABBREVIATIONS,
 AND GENERAL
 NOTES

THE IDEAS AND DESIGNS INCORPORATED
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 OR CONSTRUCTION PURPOSES WITHOUT
 FIRST OBTAINING WRITTEN CONSENT OF
 TACOMA PLUMBING AND HEATING INC.

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PP001

PLUMBING GENERAL NOTES

1. PIPING MATERIAL SCHEDULE:

PIPING	LOCATION	MATERIAL	JOINT
COLD WATER (MANS)**:	ALL	TYPE 'L' COPPER	% LEAD FREE SOLDER
HOT WATER (MANS)**:	ALL	TYPE 'L' COPPER	% LEAD FREE SOLDER
COLD WATER (BRANCH)**:	ALL	PEX	MECHANICAL (ENGINEERED PLASTIC)
HOT WATER (BRANCH)**:	ALL	PEX	MECHANICAL (ENGINEERED PLASTIC)
WASTE RUNOUTS:	ALL	ABS	SOLVENT CEMENT
WASTE MAINS (SUB GRADE):	ALL	ABS	SOLVENT CEMENT
VENT :	ALL	ABS	SOLVENT CEMENT

* UNLESS OTHERWISE SPECIFIED, ALL PEX PIPE FITTINGS MATERIAL SHALL BE ENGINEERED PLASTIC TYPE.
 ** OPTIONAL PROGRESS PIPE FITTING JOINTS.
2. PIPING INSULATION SHALL BE PER PP801.
3. MATERIALS, METHODS AND INSTALLATION SHALL COMPLY WITH THE PROVISIONS OF THE FOLLOWING STATE OF WASHINGTON ADOPTED CODES:
 B. 2018 UNIFORM PLUMBING CODE (UPC)
 C. 2018 WASHINGTON STATE ENERGY CODE (WSEC)
 D. WASHINGTON ADMINISTRATIVE CODE (WAC)
 E. 2010 STANDARDS FOR ACCESSIBLE DESIGN (CHAPTER 6)
4. PLUMBING PLANS ARE SCHEMATIC AND DO NOT INDICATE EVERY OFFSET REQUIRED. PRIOR TO COMMENCING ROUGH-IN, COORDINATE WITH ALL TRADES FOR ROUTING AND EQUIPMENT ACCESS/CLEARANCE REQUIREMENTS.
5. TRENCHING, BACKFILLING AND COMPACTING FOR UNDERGROUND PLUMBING SHALL BE THE RESPONSIBILITY OF TACOMA PLUMBING UNLESS STATED OTHERWISE IN THE CONTRACT DOCUMENTS. BACKFILL PER LOCAL JURISDICTION REQUIREMENTS.
6. PRIOR TO PLUMBING ROUGH-IN FOR ALL PLUMBING FIXTURES, VERIFY MOUNTING HEIGHT ELEVATIONS AND ROUGH-IN LOCATIONS WITH ARCHITECTURAL FLOOR PLANS AND ARCHITECTURAL INTERIOR ELEVATIONS.
7. UNLESS OTHERWISE SPECIFIED, SLOPE ALL WASTE PIPING 3" AND SMALLER AT 2% PER LINEAR FOOT, AND ALL PIPING 4" AND LARGER AT 1% PER LINEAR FOOT.
8. WHERE POSSIBLE, SUSPEND PIPING WITHIN 12" OF BUILDING STRUCTURE AND PER UPC TABLES 313.3 AND 313.6.
9. PIPING PENETRATIONS OF FIRE RATED CEILING, WALLS, AND FLOOR ASSEMBLIES SHALL BE FIRE STOPPED WITH ENGINEERED AND TESTED UL LISTED MATERIALS WHICH ARE FM APPROVED, MEETING THE RATED ASSEMBLY SO AS TO MAINTAIN THE INTEGRITY AND THE RATING OF THE FIRE RATED CEILING, WALL AND FLOOR ASSEMBLIES.
10. PIPING PENETRATIONS OF SMOKE RATED CEILING, WALLS, AND FLOORS SHALL BE STOPPED SO AS TO MAINTAIN THE INTEGRITY AND RATING OF THE FIRE RATED CEILING, WALL, AND FLOOR ASSEMBLIES.
11. INSTALL RECTORSAL TRAP SEALS FOR ALL FLOOR DRAINS. SIZE TO MATCH FLOOR DRAIN OUTLET. ALL LOW USE TRAPS SHALL BE PROVIDED WITH TRAP PRIMERS. PROVIDE PPP OR EQUAL.
12. PROVIDE DIELECTRIC FITTING CONNECTIONS BETWEEN DISSIMILAR METALS.
13. FLOOR AND WALL CLEANOUTS SHALL BE LOCATED IN EASILY ACCESSIBLE LOCATIONS.
14. INSTALL LEAD FREE FULL PORT BALL VALVES. (AB1953, NSF/ANSI 61 AND 372)
15. LOCATE AND PROVIDE ALL REQUIRED FLOOR, WALL, AND FOOTING SLEEVES.
16. INSTALL ESCUTCHEON PLATES AT ALL EXPOSED FINISH WALL PIPE PENETRATIONS.
17. PROVIDE AND INSTALL LINK SEALS FOR ALL PLUMBING PIPING PENETRATIONS THROUGH EXTERIOR BUILDING WALL PENETRATIONS BELOW GRADE AS INDICATED ON PLUMBING PLANS.
18. ALL PLUMBING EQUIPMENT AT AN OPERATIONAL WEIGHT OF A MINIMUM OF 400 LBS SHALL BE SEISMICALLY BRACED TO BUILDING STRUCTURE WITH ENGINEERED SEISMIC BRACING COMPONENTS.
19. PLUMBING EQUIPMENT AND VALVES SHALL BE LOCATED IN EASILY ACCESSIBLE LOCATIONS, UNLESS SHOWN OTHERWISE ON ARCHITECTURAL DRAWINGS. REQUIRED ACCESS PANELS SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR FOR CONCEALED VALVE INSTALLATION LOCATIONS. COORDINATE WITH FLOOR PLANS FOR SHUTOFF VALVE AND POSSIBLE ACCESS PANEL LOCATIONS.
20. PLUMBING CONTRACTOR TO COORDINATE WITH THE GENERAL CONTRACTOR FOR PIPE ROUTING WHICH REQUIRES MODIFICATION TO THE BUILDING STRUCTURE. GENERAL CONTRACTOR TO PROVIDE ALL NECESSARY MODIFICATIONS IN BUILDING STRUCTURAL AND NON-STRUCTURAL COMPONENTS FOR PIPE ROUTING.
21. THE GENERAL CONTRACTOR TO PROVIDE BACKING FOR ALL WALL MOUNT PLUMBING FIXTURES.
22. THE GENERAL CONTRACTOR TO PROVIDE ROUGH OPENINGS IN FINISH SURFACES FOR PLUMBING TRIM WORK.
23. STORM PIPING PROVIDED AND INSTALLED BY OTHERS.
24. CONDENSATE PUMPS AND PIPING PROVIDED AND INSTALLED BY OTHERS.
25. PAINTING OF PIPING AND PIPING COMPONENTS BY OTHERS.
26. ELECTRICAL POWER FOR PLUMBING EQUIPMENT PROVIDED AND INSTALLED BY OTHERS.

PLUMBING LEGEND

SYMBOL	DESCRIPTION
---	COLD WATER PIPING
---	FLOOR PIPING (120')
---	HOT WATER RECIRCULATION PIPING
---	WASTE PIPING
---	GREASE WASTE PIPING
---	VENT PIPING
○ VTR	VENT THROUGH ROOF
⊗	BACKFLOW PREVENTER
⊙	OVERFLOW ROOF DRAIN
⊙	ROOF DRAIN
⊖	STRAINER
○ FCO	FLOOR CLEANOUT (FCO)
⊖	WALL CLEANOUT (WCO)
⊖	FLOOR DRAIN
⊖	FUNNEL FLOOR DRAIN
⊖	FLOOR SINK
⊖	AREA DRAIN
⊖	BALANCING VALVE
⊖	PRESSURE REDUCING VALVE
⊖	UNION
⊖	CHECK VALVE
⊖	BALL VALVE
⊖	RELIEF OR SAFETY VALVE
⊖	GATE VALVE
⊖	WATER HAMMER ARRESTOR
⊖	HOSE BIBB/WALL HYDRANT

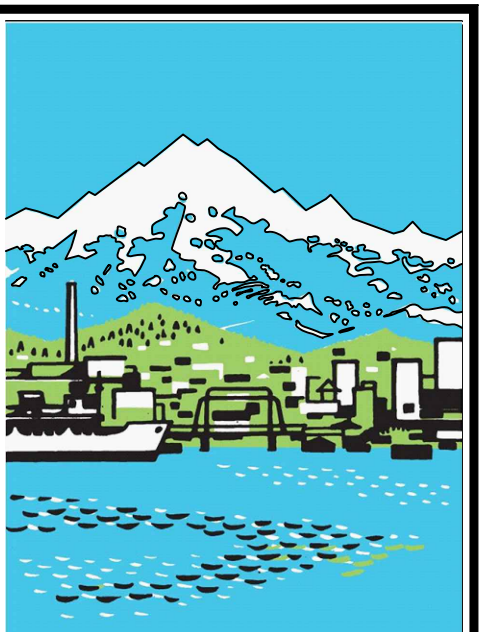
ABBREVIATIONS

ABBREV.	DESCRIPTION
ADA	AMERICANS WITH DISABILITIES ACT
CO	CLEANOUT
CW	COLD WATER
CV	CHECK VALVE
DEG F, °F	DEGREE FAHRENHEIT
DN	DOWN
EQUIP	EQUIPMENT
ELEC. EC	ELECTRICAL ELECTRICAL CONTRACTOR
FCO	FLOOR CLEANOUT
FM	FORGED MAIN
FT	FEET
GC	GENERAL CONTRACTOR
GPM	GALLON PER MINUTE
HW	HOT WATER
HWIC	HOT WATER CIRCULATING
I.E.	INVERT ELEVATION
KW	KILOWATT
MC	MECHANICAL HVAC CONTRACTOR
MFR	MANUFACTURER
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
N.I.C.	NOT IN CONTRACT
NO. #	NUMBER
PC	PLUMBING CONTRACTOR
PH	PHASE
P.D.I.	PLUMBING AND DRAINAGE INSTITUTE
PSI	POUNDS PER SQUARE INCH
RO	REVERSE OSMOSIS
SCD	SURFACE CLEANOUT
TYP	TYPICAL
VTR	VENT THROUGH ROOF
V	VOLTS, VOLTAGE
WCO	WALL CLEANOUT
WH	WALL HYDRANT
W	WASTE
WI	WITH

STATIC WATER PRESSURE
 80 PSI @ HYDRANT ON SW CORNER OF PARCEL PER VALLEY WATER DISTRICT.



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FOUNDATION
 PLAN NORTH

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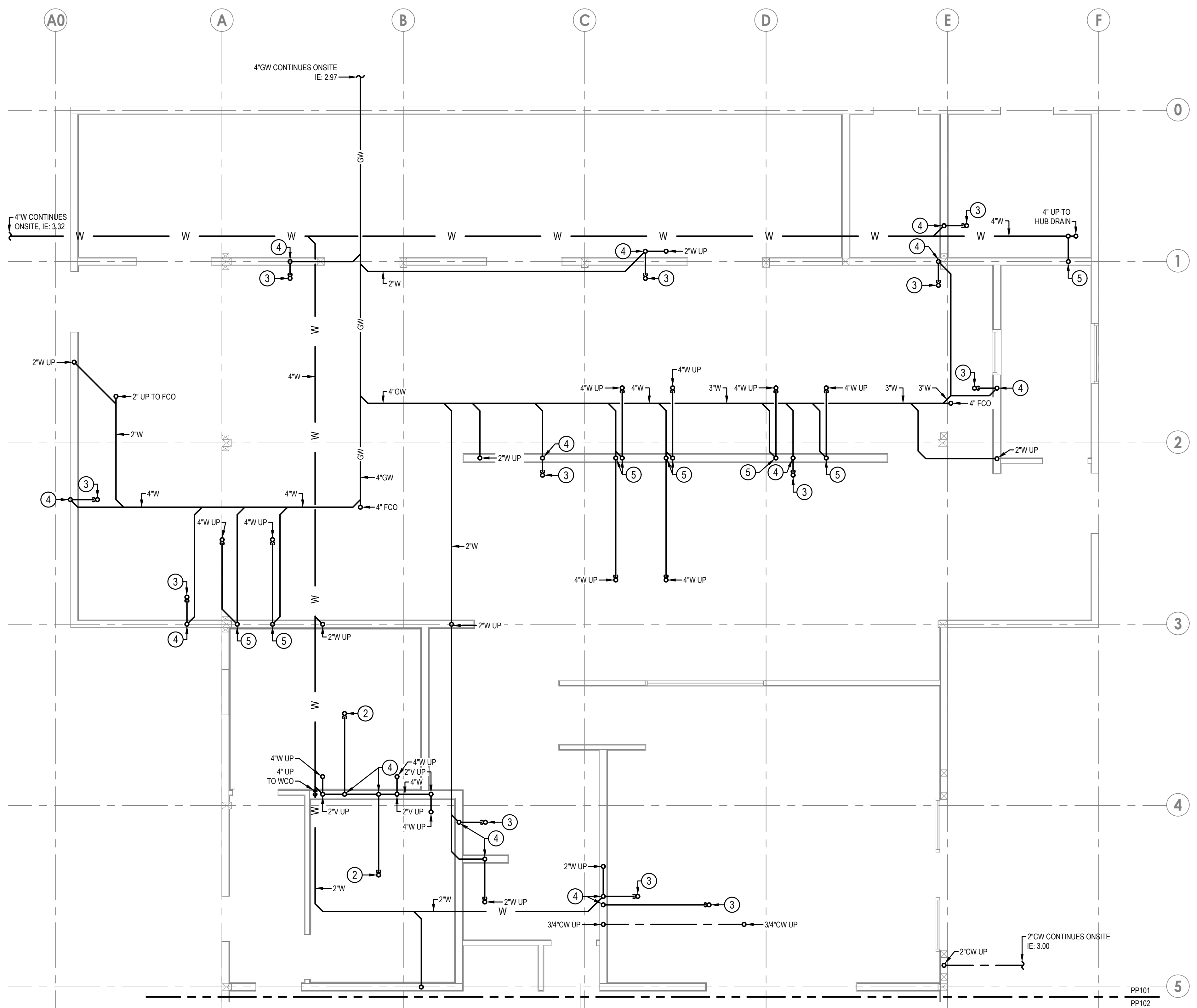
PP101

GENERAL NOTES

1. PIPING IS SCHEMATIC IN NATURE CONTRACTOR TO PROVIDE ADDITIONAL FITTINGS AND OFFSETS AS REQUIRED TO INSTALL A COMPLETE AND FUNCTIONING SYSTEM.
2. ALL WASTE PIPING 3" AND BELOW SLOPED AT 1/4" PER FOOT AND ALL WASTE PIPING 4" OR ABOVE SLOPED AT 1/8" PER FOOT.
3. FINISHED FLOOR ELEVATION OF BUILDING IS 75.53'. COORDINATE ANY VARIATIONS IN AS-BUILT ELEVATION OF BUILDING WITH PLUMBING SCOPE AND CIVIL.

PLAN NOTES

- 1 PROVIDE 2" WCO IN RISER.
- 2 2" UP TO FD2
- 3 2" UP TO FS2
- 4 1-1/2" V UP
- 5 2" V UP

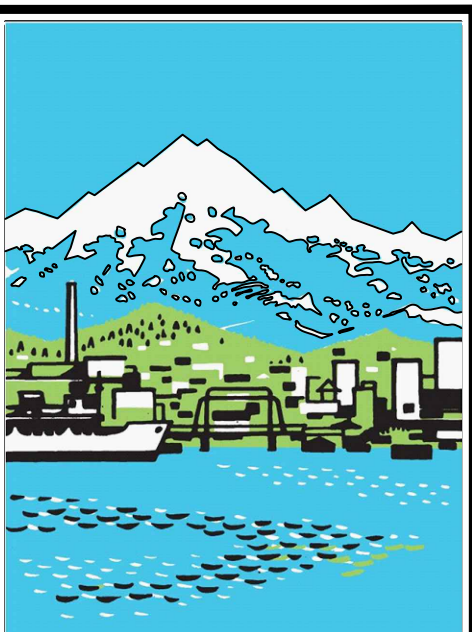


1 FOUNDATION PLAN - NORTH
 SCALE: 1/4" = 1'-0"

1	2	3	4	2
PP501	PP501	PP501	PP501	PP502



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FIRST FLOOR
 NORTH

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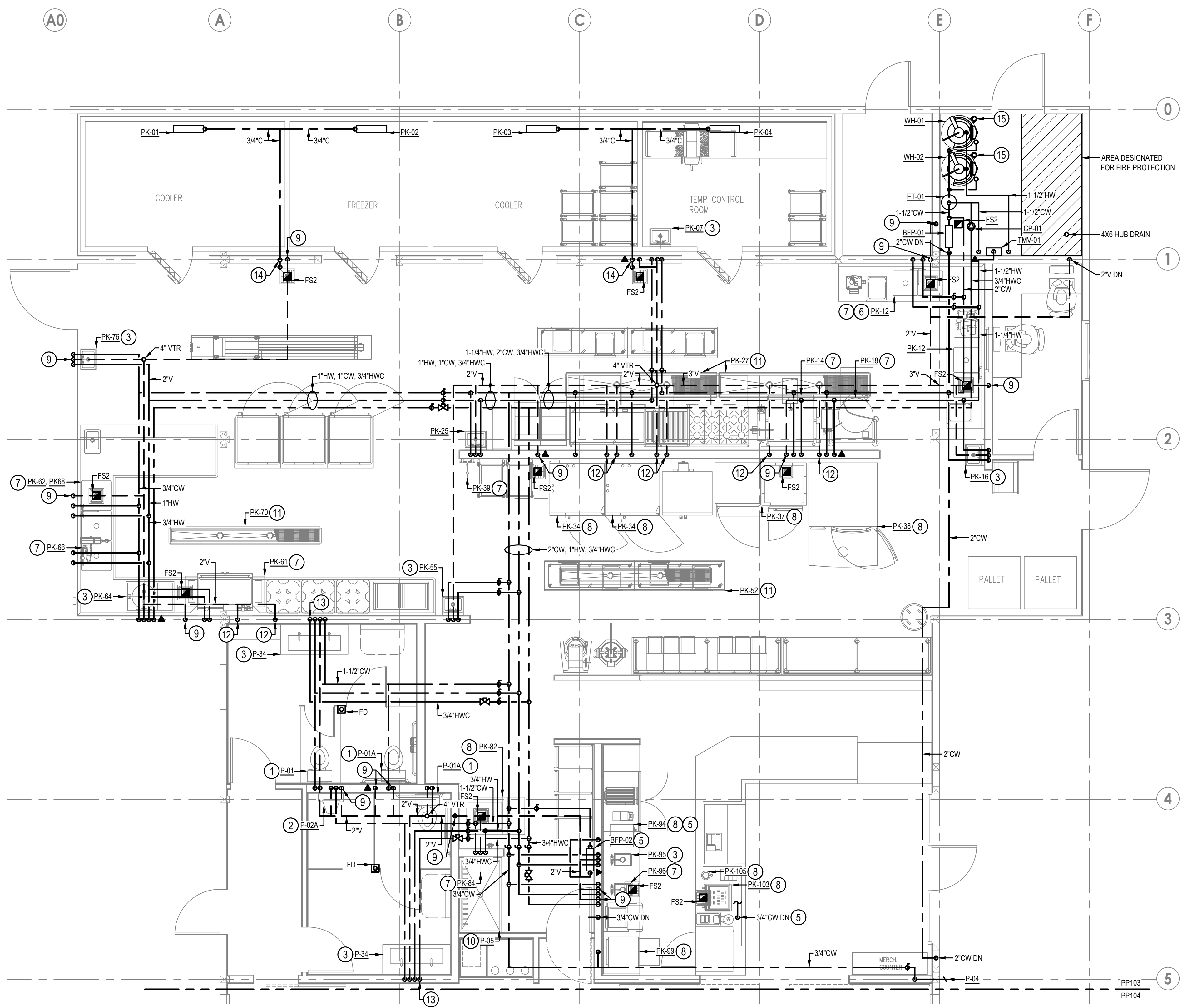
PP102

GENERAL NOTES

1. PIPING IS SCHEMATIC IN NATURE CONTRACTOR TO PROVIDE ADDITIONAL FITTINGS AND OFFSETS AS REQUIRED TO INSTALL A COMPLETE AND FUNCTIONING SYSTEM.
2. MAINTAIN 10' CLEAR BETWEEN PLUMBING VENTS AND EXHAUST AND MECHANICAL AIR INTAKES.

PLAN NOTES

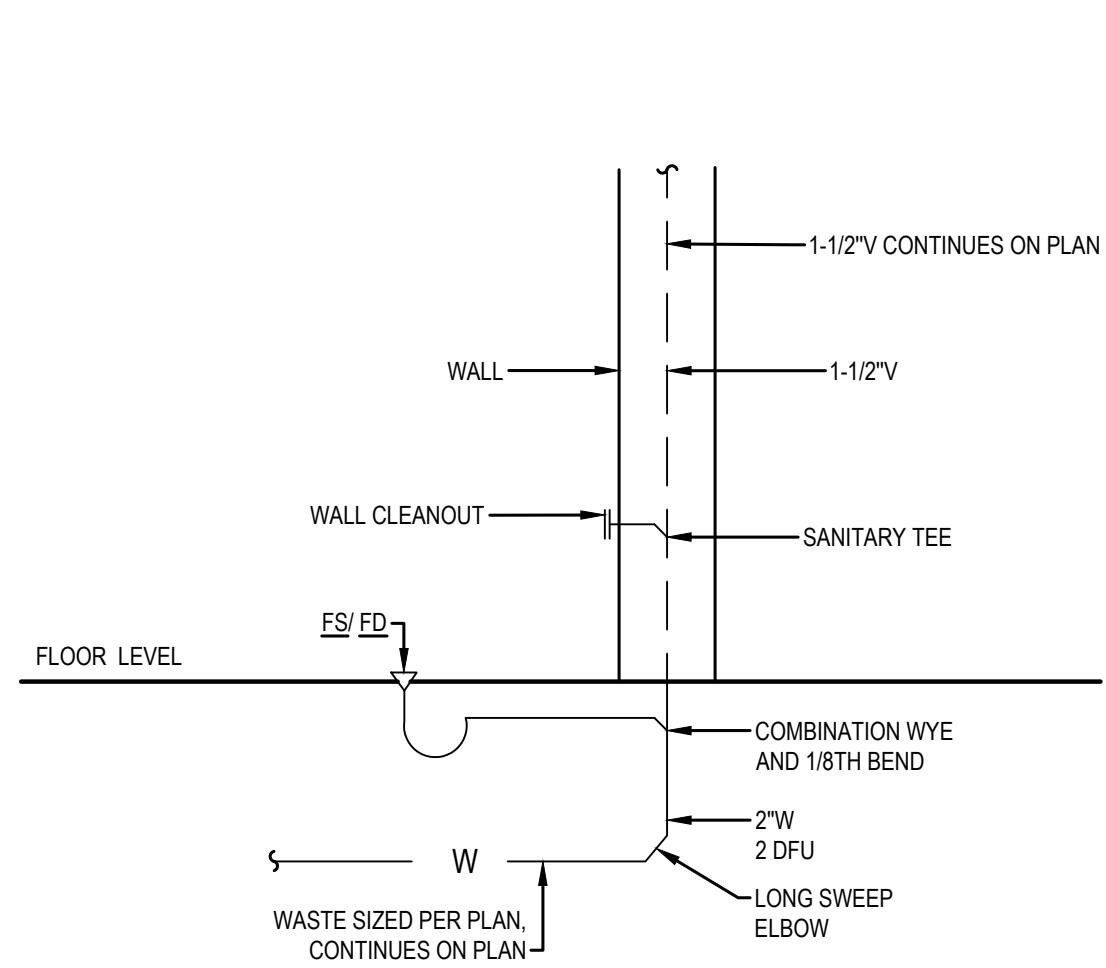
- 1 4"W, 2"V, 3/4"CW
- 2 2"W, 1-1/2"V, 3/4"CW
- 3 2"W, 1-1/2"V, 3/4"CW, 3/4"HW.
- 4 ROUTE 3/4" COND DOWN TO FLOOR SINK.
- 5 ROUTE COLD WATER FROM BACKFLOR PREVENTER TO COFFEE MAKER. CONFIRM EXACT REQUIREMENTS WITH CLIENT BEFORE INSTALLATION AND PROVIDE APPROPRIATE CONNECTIONS.
- 6 ROUTE HOT WATER AND COLD WATER DOWN IN WALL AND UNDERNEATH FIXTURE. CONNECT TO DECK MOUNTED FAUCETS.
- 7 3/4"HW AND CW
- 8 3/4"CW
- 9 1-1/2"V DN
- 10 2"W, 1-1/2"V
- 11 4"W, 2"V
- 12 2"V DN
- 13 3/4"HW/C DN
- 14 PROVIDE P-TRAP FOR CONDENSING UNITS OUTSIDE OF REFRIGERATION UNIT. ROUTE 3/4"C TO NEARBY FLOOR SINK.
- 15 ROUTE 3" COMBUSTION AIR AND FLUE TO ROOFTOP. TERMINATE WITH CONCENTRIC VENT KIT.



1 NORTH
FIRST FLOOR PLAN - NORTH
 SCALE: 1/4" = 1'-0"
 6 PP501 7 PP501 8 PP501 9 PP501 10 PP501 11 PP501 1 PP502 3 PP502

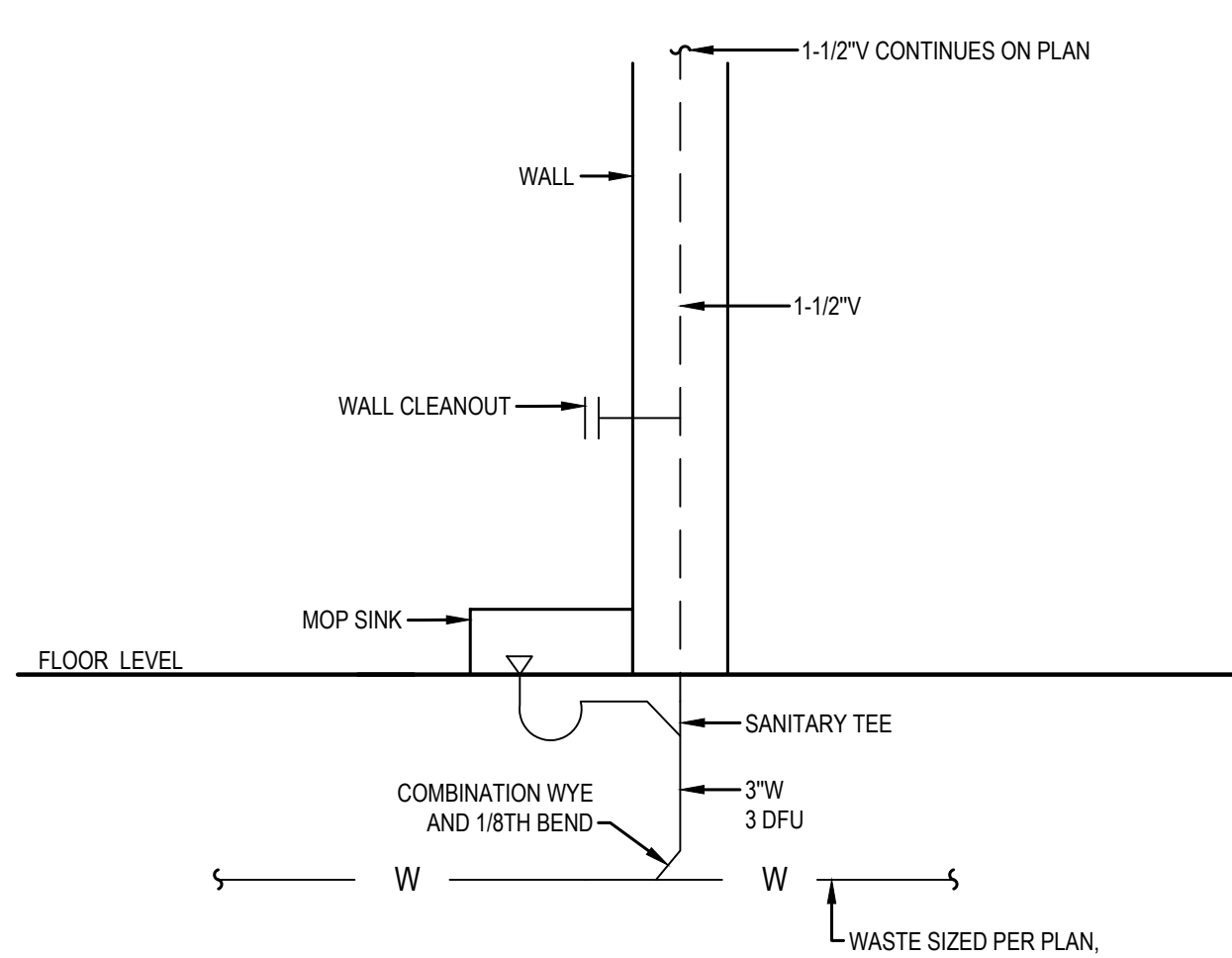


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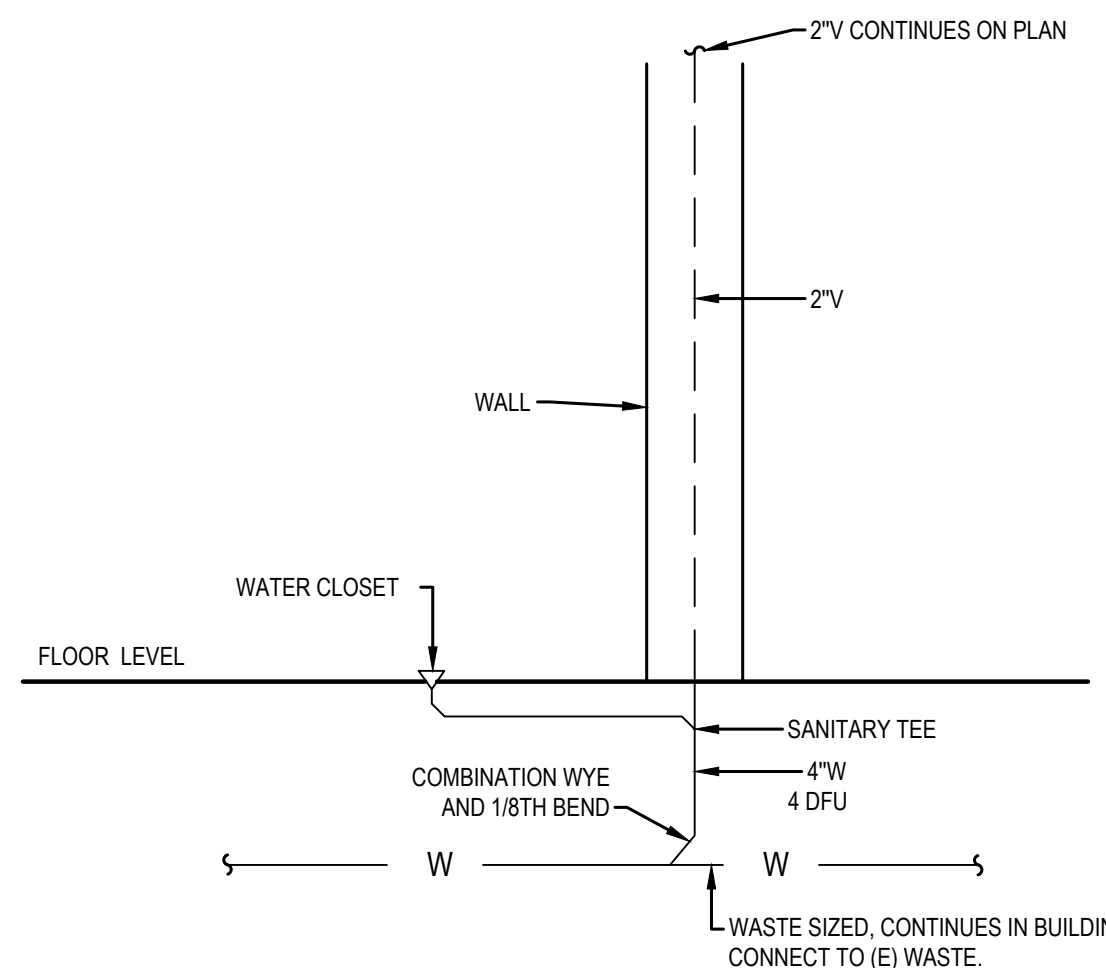
NOTE: LINE INVERT = FINISH FLOOR -1.760 MINIMUM

FLOOR SINK/ FLOOR DRAIN RISER 1
NOT TO SCALE PP501



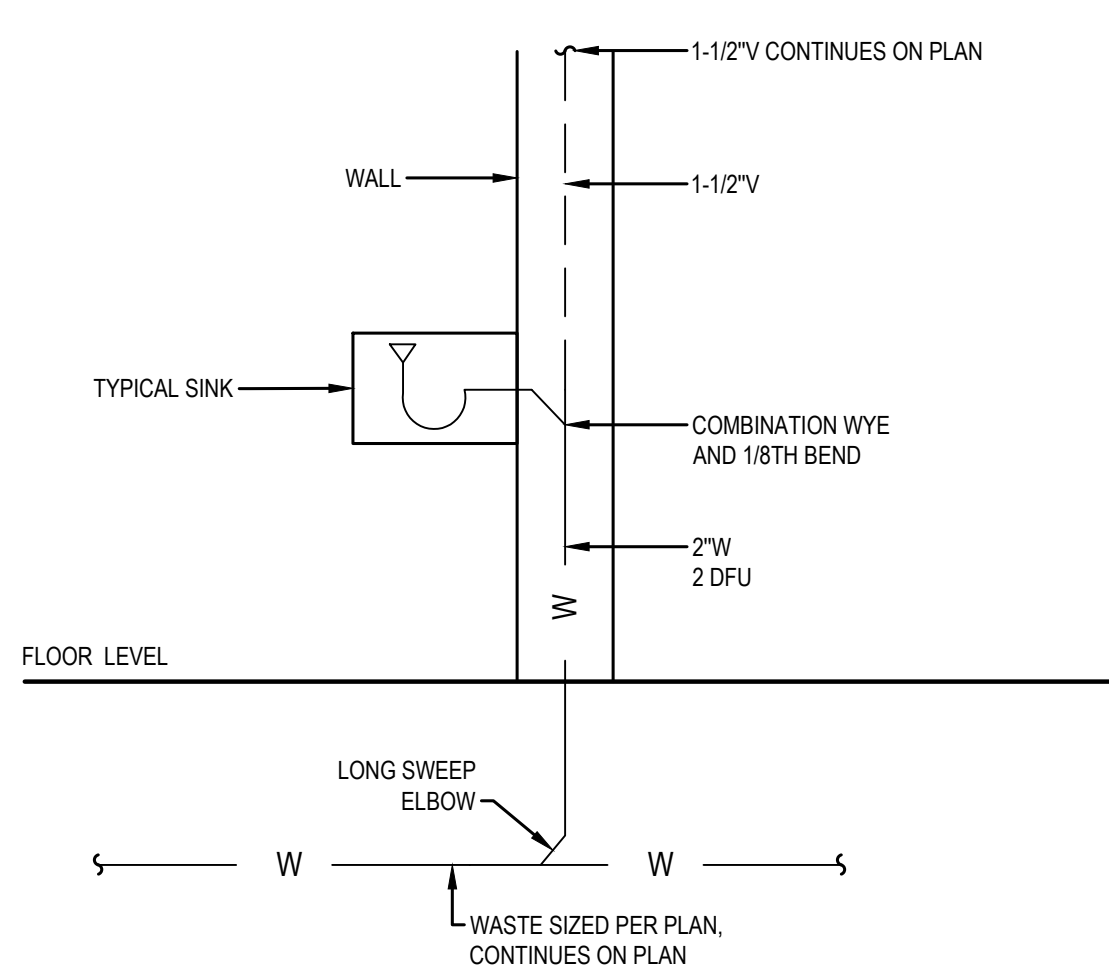
NOTE: LINE INVERT = FINISH FLOOR -2.313 MINIMUM

MOP SINK RISER 2
NOT TO SCALE PP501



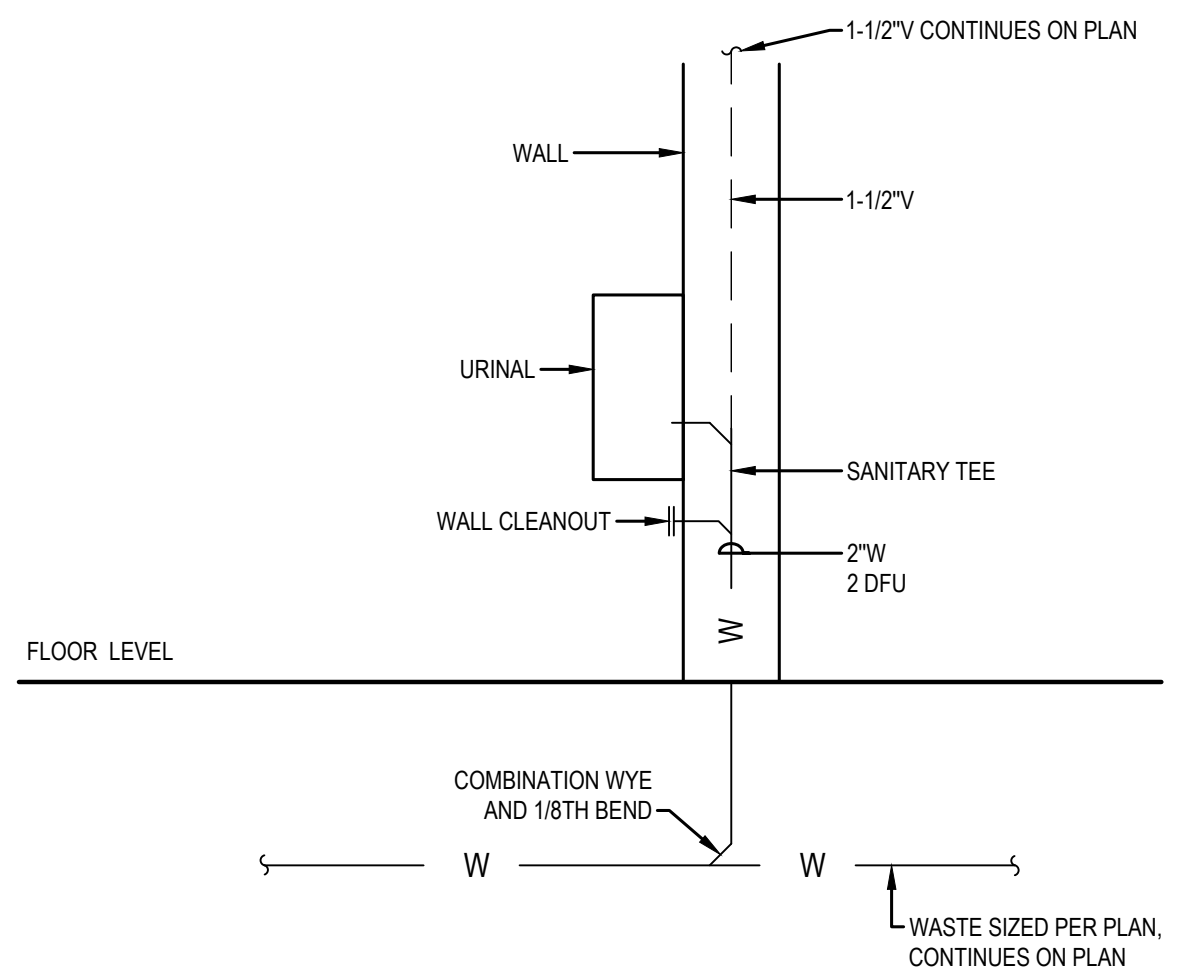
NOTE: LINE INVERT = FINISH FLOOR -2.313 MINIMUM

WATER CLOSET RISER 3
NOT TO SCALE PP501



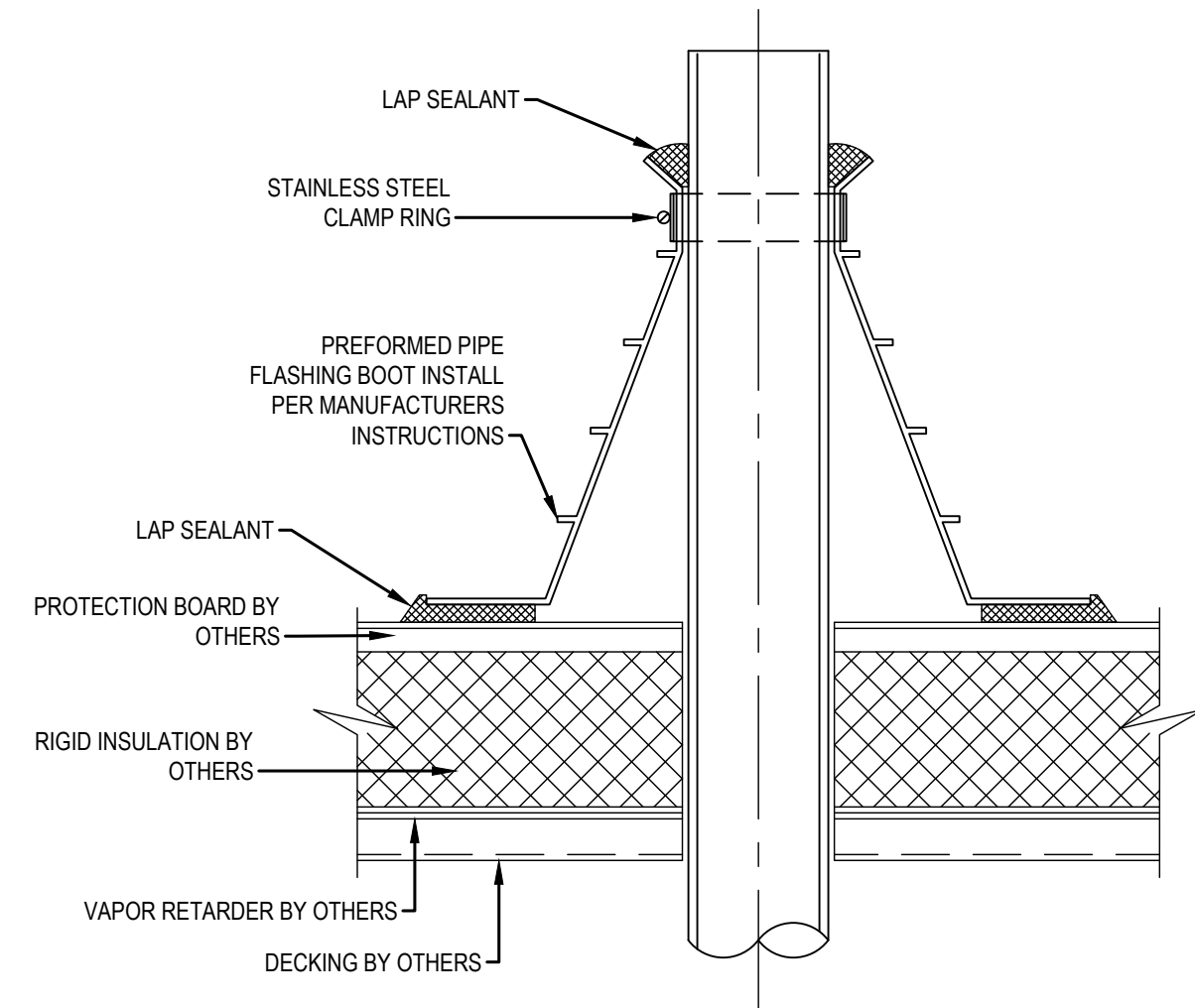
NOTE: LINE INVERT = FINISH FLOOR -1.208 MINIMUM

TYPICAL SINK RISER 4
NOT TO SCALE PP501

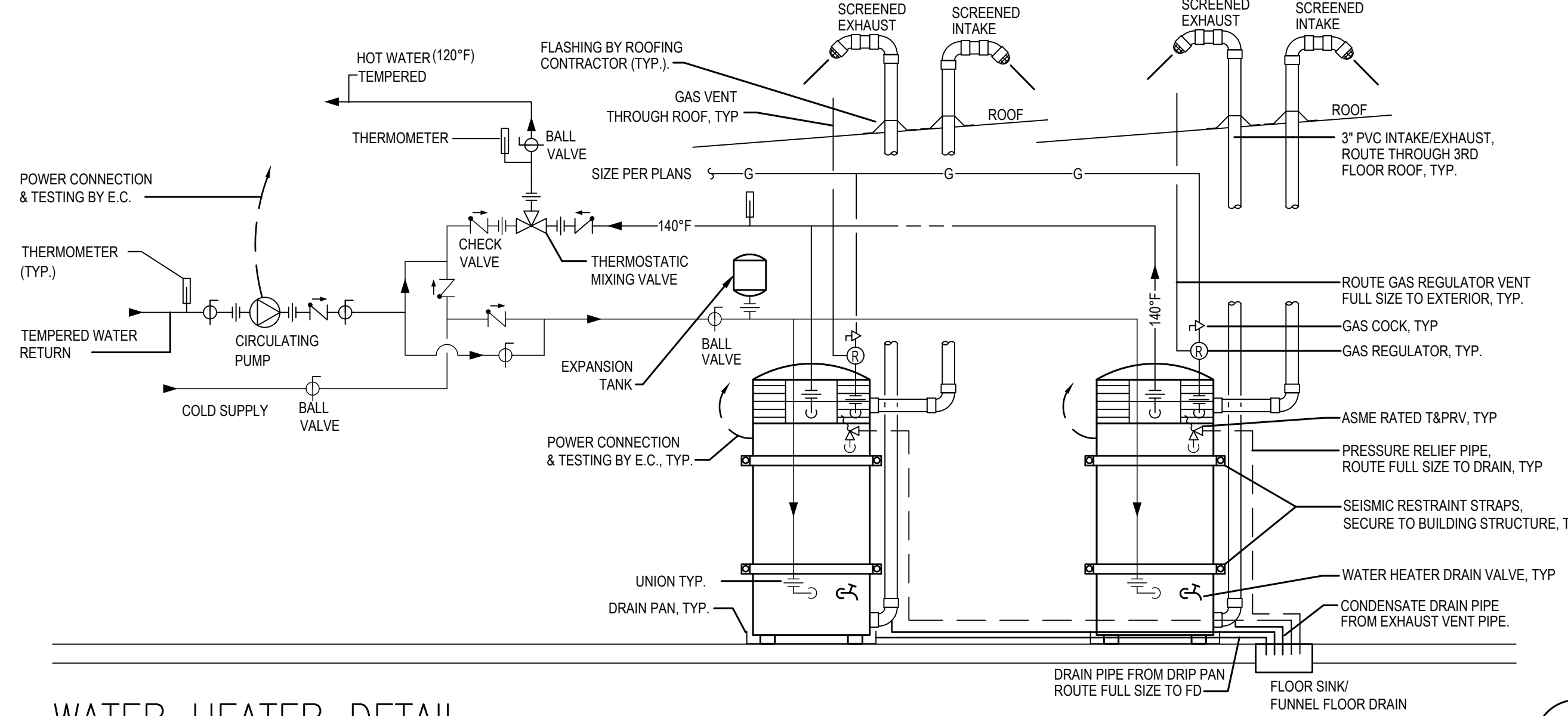


NOTE: LINE INVERT = FINISH FLOOR -1.208 MINIMUM

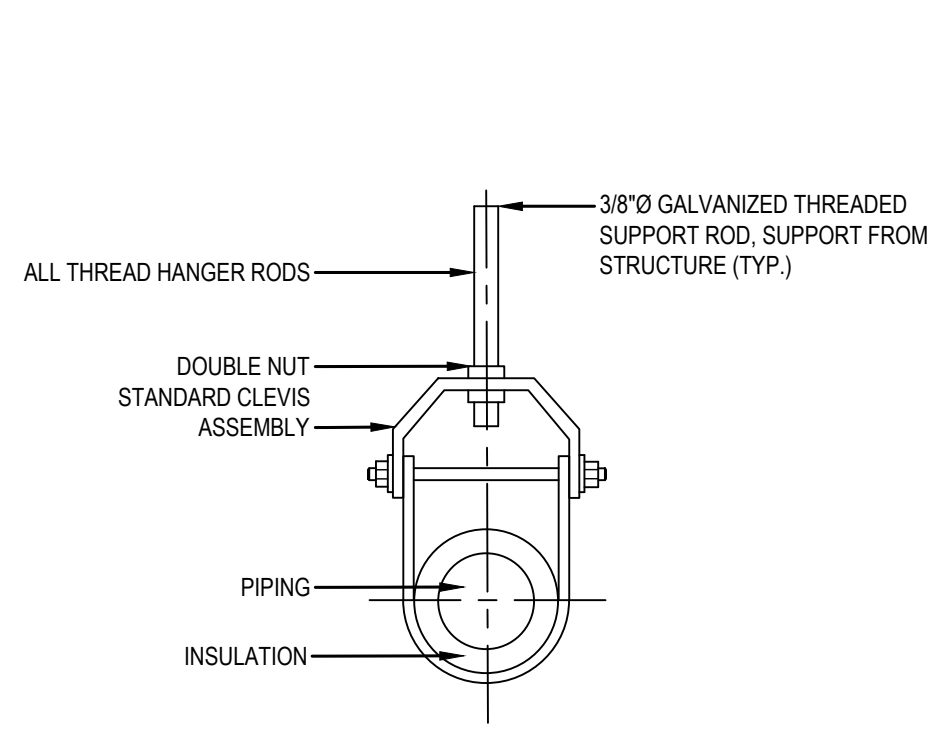
URINAL WASTE RISER DETAIL 5
NOT TO SCALE PP501



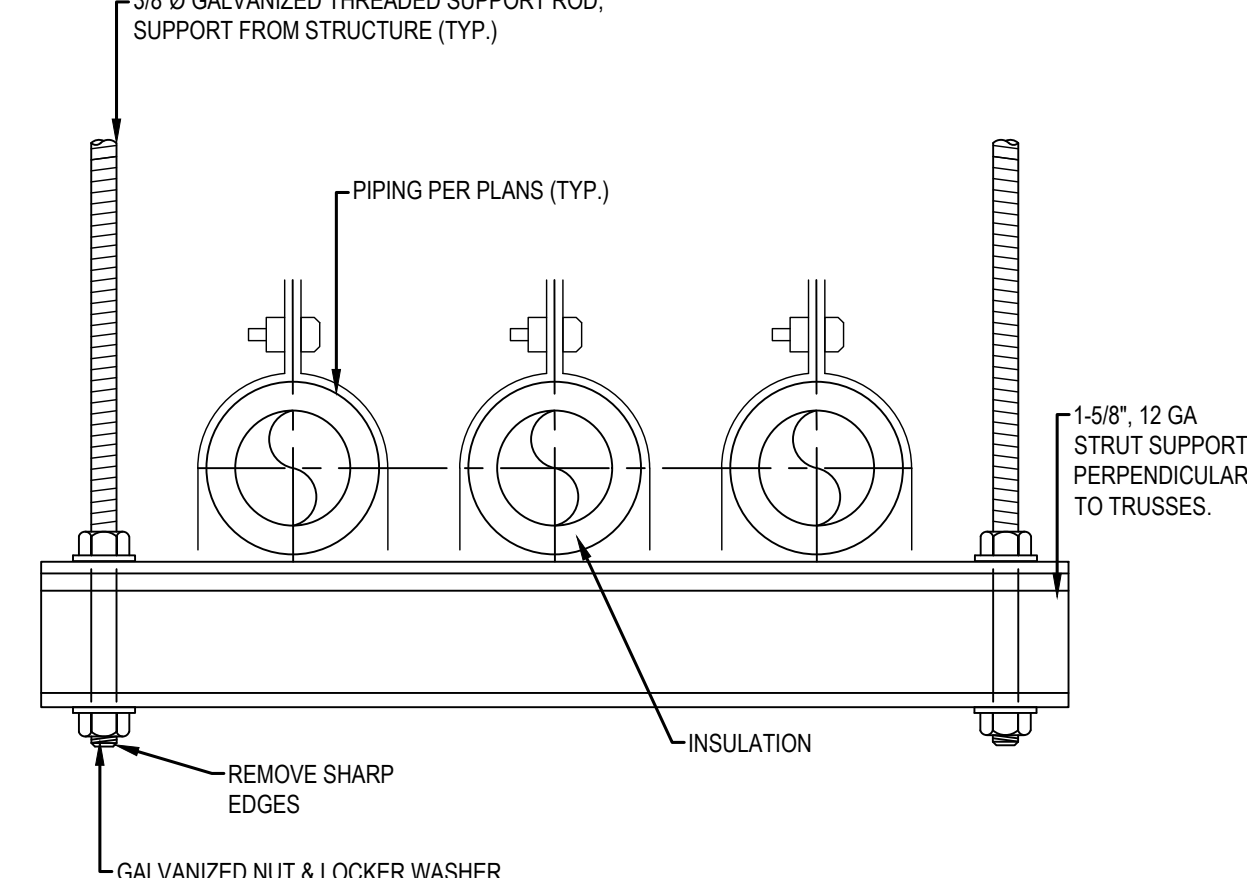
VENT THROUGH ROOF DETAIL 6
NOT TO SCALE PP501



WATER HEATER DETAIL 7
NOT TO SCALE PP501

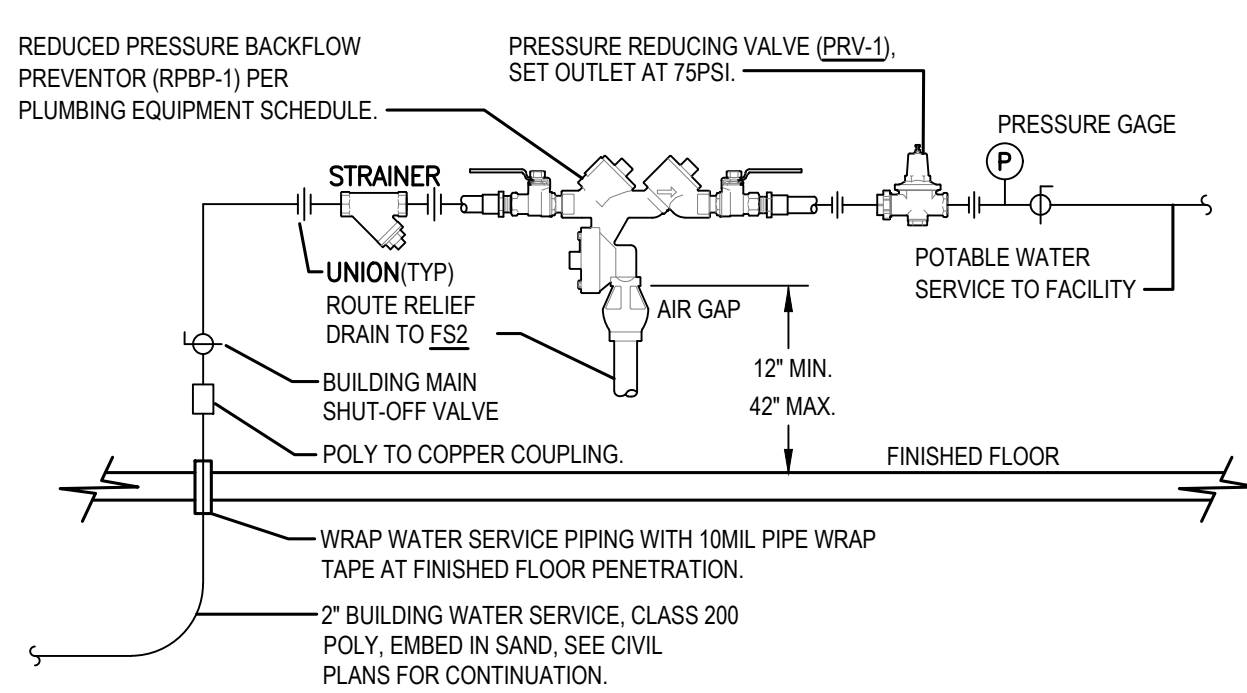


PIPE HANGER DETAIL 8
NOT TO SCALE PP501

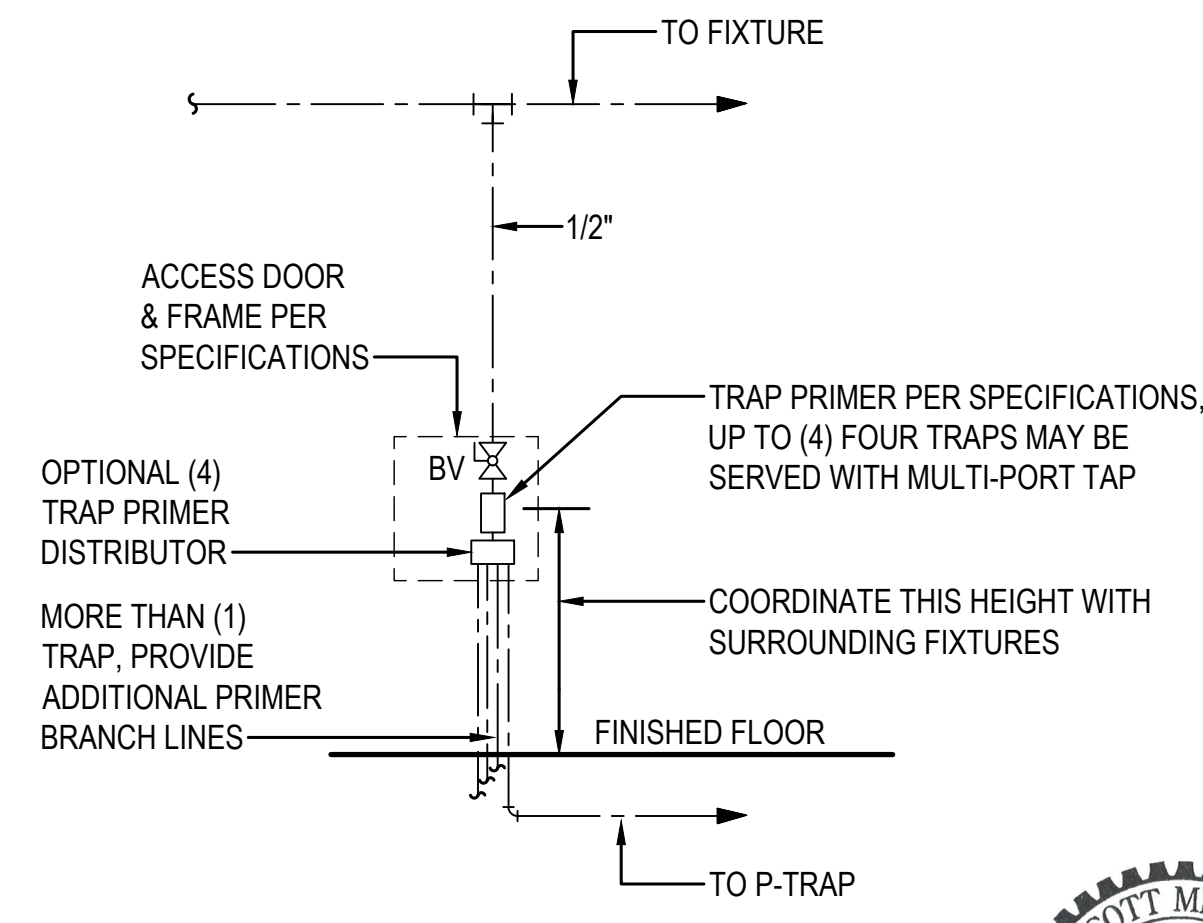


NOTE: PROVIDE THREE SUPPORT RODS FOR STRUT LONGER THAN 24"

TRAPEZE PIPE HANGER DETAIL 9
NOT TO SCALE PP501



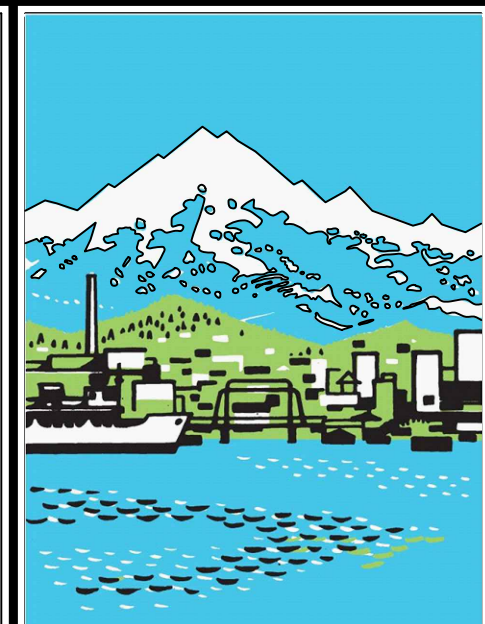
BUILDING WATER SERVICE DETAIL 10
NOT TO SCALE PP501



TRAP PRIMER PIPING DIAGRAM 11
NOT TO SCALE PP501



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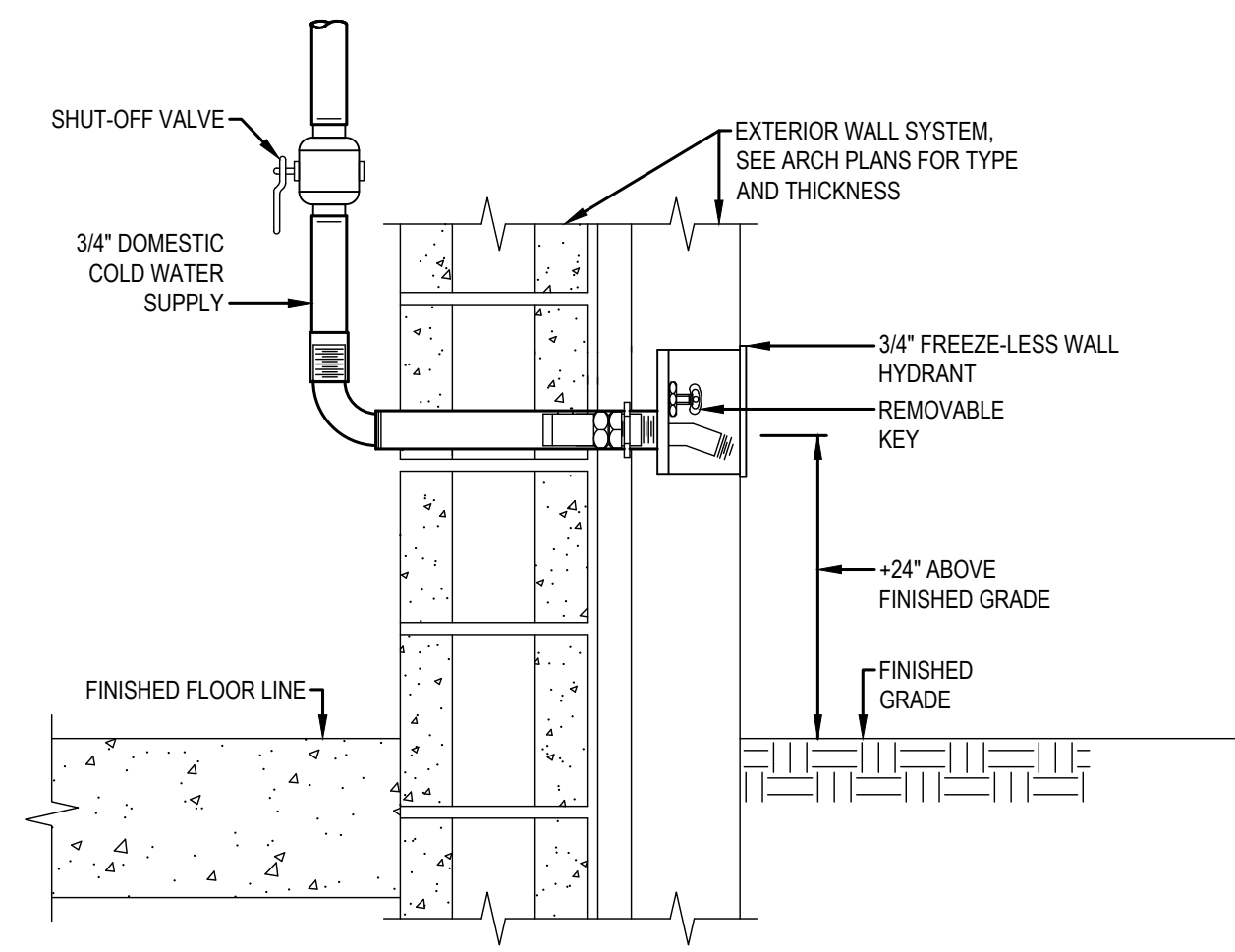
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DETAILS I

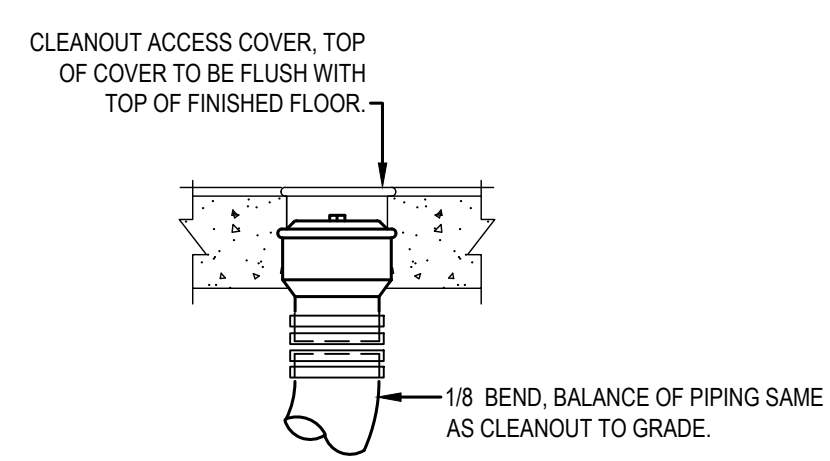
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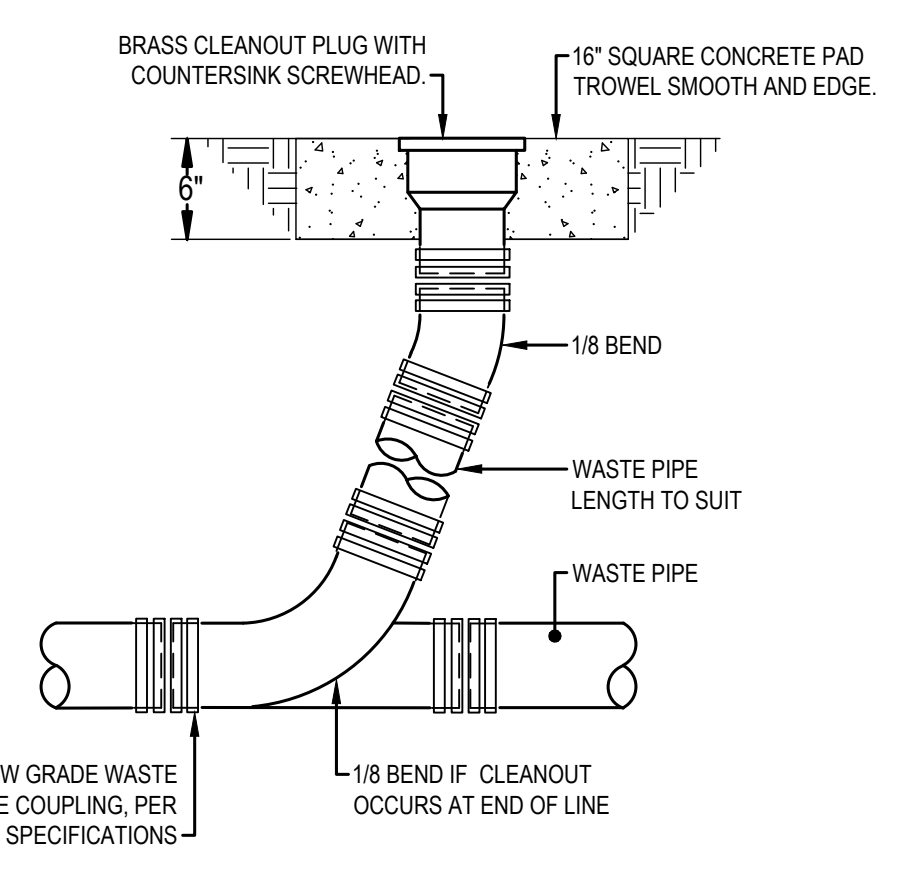
EXTERIOR WALL HYDRANT
NOT TO SCALE

1
PP502

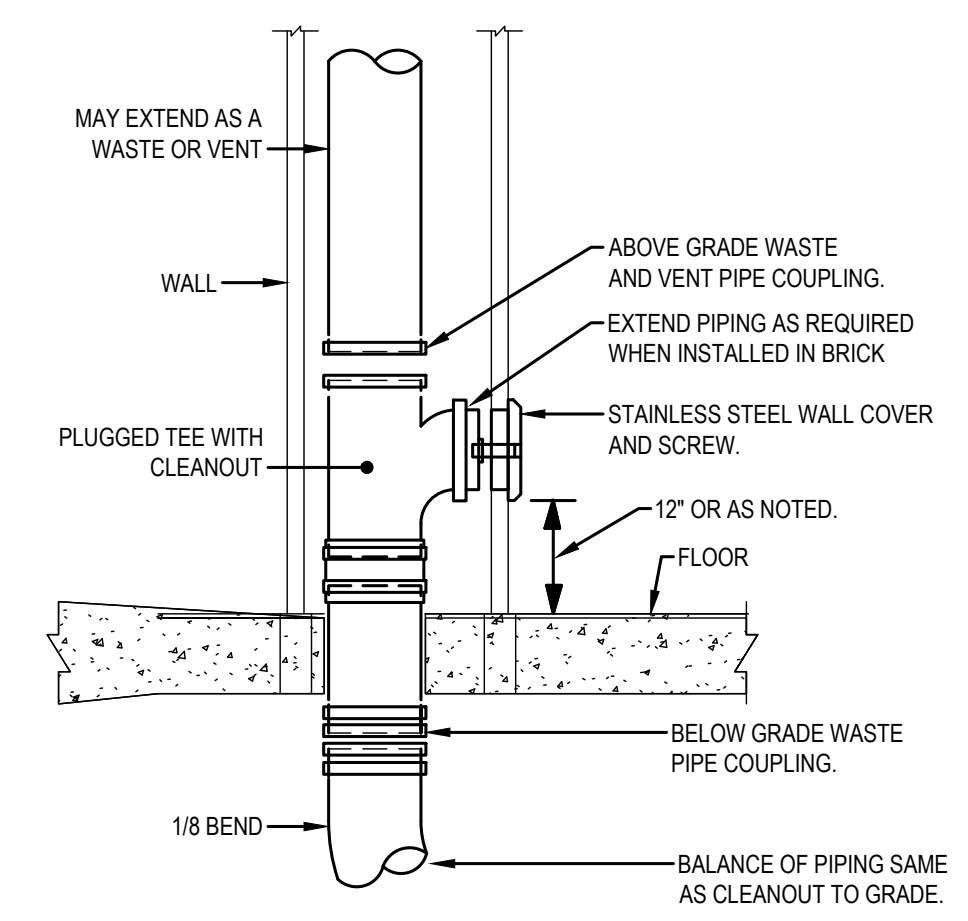


FLOOR CLEANOUT (FCO)

CLEANOUT DETAIL
NOT TO SCALE

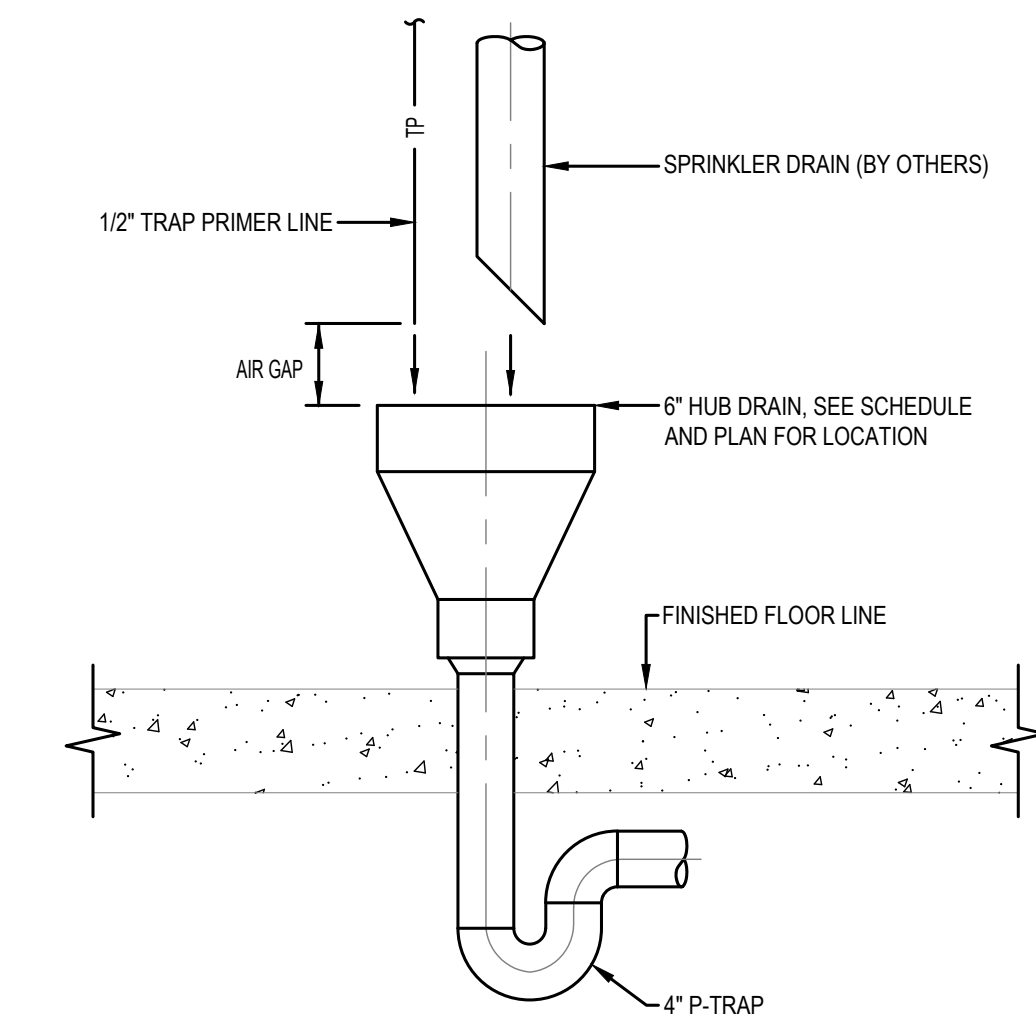


CLEANOUT TO GRADE (SCO)



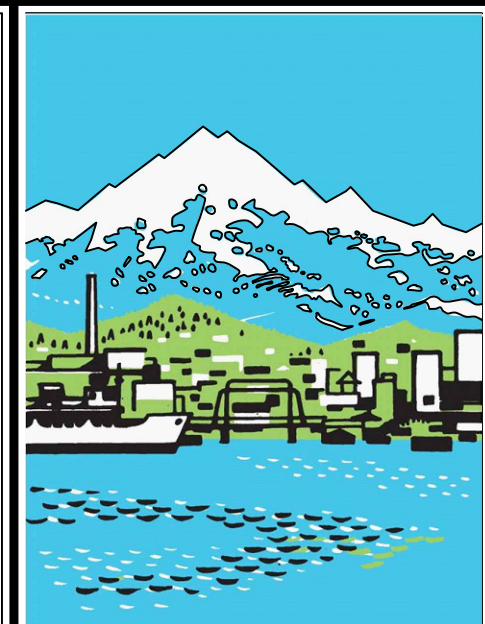
WALL CLEANOUT (WCO)

2
PP502



HUB DRAIN DETAIL
NOT TO SCALE

3
PP502



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DETAILS II

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MIDDLEBROOK
ENGINEERING, LLC
6216 174TH AVE. SW, LONGBRANCH, WA 98351

GENERAL CONTRACT REQUIREMENTS

- MECHANICAL, PLUMBING, AND CONTROLS SCOPE SHALL FALL UNDER THE ULTIMATE RESPONSIBILITY OF ONE CONTRACTOR, WHO IS RESPONSIBLE FOR UNDERSTANDING ALL MECHANICAL AND PLUMBING DOCUMENTS, DISTRIBUTING CONTRACT DOCUMENTS TO ALL SUBCONTRACTORS, AND SHALL BE RESPONSIBLE FOR CONTRACT COMPLETION. THE DRAWINGS ARE DIAGRAMMATIC. COORDINATE INSTALLATION WITH THE BUILDING. PROVIDE ALL NECESSARY OFFSETS, CHANGES IN DIRECTION, EXTENSIONS AND ASSOCIATED MATERIALS FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
- ***COORDINATE MECHANICAL WORK WITH ELECTRICAL, ARCHITECTURAL, STRUCTURAL, CIVIL, AND LANDSCAPE WORK SHOWN ON OTHER CONTRACT DOCUMENTS. PROVIDE ADDITIONAL PIPE OR DUCT OFFSETS WHERE REQUIRED TO COORDINATE INSTALLATION.***
- LOCATIONS AND SIZES OF (FLOOR, WALL, AND ROOF OPENINGS) SHALL BE COORDINATED WITH OTHER TRADES INVOLVED. INCLUDE THE FOLLOWING IN THE COST OF MECHANICAL WORK: CUTTING, CORING, PATCHING AND PAINTING OF EXISTING WALLS, CEILINGS, FLOORS, AND ROOFS AS REQUIRED TO ACCOMMODATE WORK AS INDICATED IN THE MECHANICAL CONTRACT DOCUMENTS UNLESS SPECIFICALLY SHOWN ON ARCHITECTURAL DOCUMENTS.***
- MAINTAIN A SET OF PLANS ON SITE. RECORD ALL CHANGES TO ACTUAL ARRANGEMENTS ON THESE PLANS. PROVIDE THIS SET OF PLANS TO THE OWNER'S REPRESENTATIVE WHEN WORK IS COMPLETE.
- ALL WORK PERFORMED SHALL BE DONE IN STRICT ACCORDANCE TO ALL APPLICABLE MECHANICAL, BUILDING, ENERGY, FUEL, GAS, AND LOCAL CODES, WITH AMENDMENTS. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CONSTRUCTION FEES. FURNISH FINAL CERTIFICATE TO OWNER SHOWING COMPLIANCE WITH CODE REQUIREMENTS.
- PROJECT SCHEDULING: COMPLY WITH OWNER'S REQUIREMENTS
- OPERATION AND MAINTENANCE MANUAL: PROVIDE COMPLETE OPERATIONS AND MAINTENANCE MANUAL IN HARD COVER. PROVIDE OPERATIONS, MAINTENANCE AND PARTS DATA ON ANY ITEM OF EQUIPMENT THAT HAS MOVING PARTS.
- PROVIDE THE FOLLOWING DOCUMENTS PRIOR TO FINAL ACCEPTANCE OF THE PROJECT. FINAL PAYMENT OF THE CONTRACT WILL BE CONTINGENT UPON RECEIVING THESE DOCUMENTS:
 - RECORD (AS-BUILT) DRAWINGS.
 - MAINTENANCE AND OPERATING INSTRUCTIONS (3 SETS).
 - EXTENDED WARRANTIES (OTHER THAN THE ONE-YEAR).
 - BALANCING LOGS (3 SETS).
 - FINAL CERTIFICATES OF INSPECTION AND CODE COMPLIANCE.
 - COMMISSIONING DOCUMENTATION PER WSEC.
- WARRANTY PROVISIONS: THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT AND SYSTEMS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIAL, EQUIPMENT, OR POOR WORKMANSHIP, WHICH MAY SHOW ITSELF DURING THIS WARRANTY PERIOD.

SEISMIC AND VIBRATION REQUIREMENTS

- HANGERS AND SEISMIC BRACING FOR THE MECHANICAL SYSTEMS SHALL BE DESIGNED AND PROVIDED BY THE MECHANICAL CONTRACTOR. REFER TO CONTRACTOR SHOP DRAWINGS FOR LOCATIONS OF EQUIPMENT AND HUNG MECHANICAL SYSTEMS. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE SUPPORT SYSTEMS AND DESIGN LOADS FOR HUNG MECHANICAL SYSTEMS WITH THE GENERAL CONTRACTOR AND OTHER TRADES THAT MAY BE IMPACTED.
 - PROVIDE ALL SEISMIC RESTRAINT REQUIRED BY THE AUTHORITY HAVING JURISDICTION AND THE APPLICABLE CODES.
 - EMPLOY A LICENSED STRUCTURAL ENGINEER, IF NECESSARY, TO ACHIEVE COMPLIANCE.
 - THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA) SEISMIC RESTRAINT MANUAL GUIDELINES MAY BE USED FOR PIPING AND DUCTWORK. INSURE THE PROPER HAZARD LEVEL IS EMPLOYED FOR THE AREA OF INSTALLATION.
- VIBRATION CRITERIA: PROVIDE VIBRATION ISOLATION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE); APPLICATIONS HANDBOOK.

BASIC MATERIALS AND METHODS

- ALL MATERIALS AND EQUIPMENT SHALL BE LISTED OR LABELED BY A RECOGNIZED AGENCY. UL, AGA, FM, CSA, ARI, ETC.
- EQUIPMENT SHALL BE AS INDICATED ON THE DRAWING SCHEDULES. THE DRAWING SCHEDULES ESTABLISH THE LEVEL OF QUALITY. SUBSTITUTIONS WILL BE CONSIDERED. SUBMIT TECHNICAL DATA (PERFORMANCE AND CONSTRUCTION) TO THE OWNER'S REPRESENTATIVE FOR APPROVAL. ALLOW TWO WEEKS FOR TURN-AROUND.
- MECHANICAL SYSTEM PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE PROTECTED IN ACCORDANCE WITH THE BUILDING CODE IN FORCE IN THE AUTHORITY HAVING JURISDICTION FOR THIS PROJECT. THIS INCLUDES PIPING, DUCTWORK, SUPPORTS, CONDUIT, AND ANY OTHER SYSTEM AND APPURTENANCE PROVIDED AS PART OF THE MECHANICAL WORK OF THIS CONTRACT. IN ADDITION, ALL THROUGH-PENETRATION SEALING METHODOLOGIES SHALL BE LISTED IN THE UNDERWRITER'S LABORATORIES (UL) FIRE RESISTANCE DIRECTORY, ISSUE CURRENT AT TIME OF BID.
- MOTORS SHALL COMPLY WITH THE WSEC.
- ELECTRICAL INSTALLATION SHALL COMPLY WITH THE NEC.
- PROTECT OF STORED MATERIALS. REPLACE DAMAGED MATERIALS PRIOR TO INSTALLATION.
- PROVIDE WATER-TIGHT SEAL FOR OPENINGS TO THE BUILDING THROUGH WHICH PIPE PASSES.
- PROVIDE AND INSTALL PIPE SUPPORTS IN ACCORDANCE WITH MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS) STANDARDS, SPECIFICALLY STANDARD SP-69, "PIPE HANGERS AND SUPPORTS - SELECTION AND APPLICATION" AND STANDARD SP-58, "PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN AND MANUFACTURE". PROVIDE PIPE SUPPORT SPACING IN ACCORDANCE WITH THE UPC OR IMC.
- TESTING: ALL WORK UNDER THIS CONTRACT SHALL BE THOROUGHLY AND SYSTEMATICALLY TESTED, BOTH DURING CONSTRUCTION AND AFTER COMPLETION. PIPE TESTING SHALL BE EITHER AS SPECIFIED IN THE APPROPRIATE SPECIFICATION SECTION, OR AS SPECIFIED IN THE APPLICABLE PLUMBING OR MECHANICAL CODE. DUCTWORK SHALL BE TESTED AS PART OF THE AIR BALANCING PROCESS. NOTIFY THE OWNER'S REPRESENTATIVE 48-HOURS IN ADVANCE OF ALL TESTS. TESTS SHALL BE MAINTAINED UNTIL APPROVED.
- START-UP, BALANCING AND COMMISSIONING.
 - EQUIPMENT STARTUP SHALL BE PERFORMED BY QUALIFIED PERSONNEL. THE TECHNICAL SPECIFICATION SECTIONS WILL DETAIL OTHER SPECIAL REQUIREMENTS, IF ANY. PROVIDE A STATEMENT OF THE STARTUP TECHNICIANS QUALIFICATIONS IF REQUESTED BY THE OWNER'S REPRESENTATIVE OR ELSEWHERE SPECIFIED.
 - BALANCE ALL WATER SYSTEMS.
 - PROVIDE COMMISSIONING IN ACCORDANCE WITH THE WSEC, UNLESS ENHANCED COMMISSIONING IS REQUIRED. PROVIDE DOCUMENTATION OF COMMISSIONING.

CROSS-LINKED POLYETHYLENE PIPE

- INTERIOR SERVICE: CONFORM TO ASTM F877, "CROSSLINKED POLYETHYLENE (PEX) PLASTIC HOT- AND COLD-WATER DISTRIBUTION SYSTEMS."

PLASTIC PIPE, DWV & SEWER

- ABS PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS SHALL BE PER IAPMO INSTALLATION STANDARD (IS) 05-03, "ABS BUILDING DRAIN, WASTE, AND VENT PIPE AND FITTINGS."

COPPER PIPING

- COPPER PIPING SHALL BE USED FOR HYDRONICS AND AIR LINES.
- MATERIALS FOR COPPER PIPE, FITTINGS AND ACCESSORIES. ASTM B88, TYPE "L".

CAST IRON PIPE, DWV & SEWER

- HUBLESS CAST IRON (ASTM A888/ CISPI 310) OR BELL AND SPIGOT CAST IRON (ASTM A74).

PIPING SYSTEM SPECIALTIES

- SPECIALTY PIPE SYSTEMS SHALL BE CONSTRUCTED OF MATERIALS THAT ARE COMPATIBLE WITH THE TYPE OF PIPING MATERIAL AND FLUIDS IN THE SYSTEM. THEY SHALL BE RATED FOR THE TEMPERATURES AND PRESSURES OF THE SYSTEMS IN WHICH THE VALVES ARE INSTALLED.
- PROVIDE SENSORS WHERE INDICATED ON THE PLANS.
- PROVIDE DIELECTRIC BREAKS BETWEEN DISSIMILAR METALS.
- TEST PLUGS: PROVIDE NIPPLES AND COUPLINGS TO MAKE THE TEST PLUGS EXTEND THROUGH THE INSULATED PIPE.
- STRAINERS: BASKETS SHALL BE TYPE-304 STAINLESS STEEL. TEE-TYPE DESIGN SHALL PROVIDE STRAIGHT-THROUGH FLOW.

VALVES

- VALVES SHALL BE CONSTRUCTED OF MATERIALS THAT ARE COMPATIBLE WITH THE TYPE OF PIPING MATERIAL AND FLUIDS IN THE SYSTEM. VALVES SHALL BE RATED FOR THE TEMPERATURES AND PRESSURES OF THE SYSTEMS IN WHICH THE VALVES ARE INSTALLED.

PIPE TESTING

- DOMESTIC PLUMBING PIPING SHALL BE TESTED AT A PRESSURE NOT LESS THAN THE DESIGN PRESSURE FOR A PERIOD OF NOT LESS THAN 15 MINUTES. TESTS SHALL BE PER UPC CHAPTER 6. TEST GAUGES SHALL BE PER UPC 318.
- WASTE AND VENT PIPING SHALL BE TESTED WITH AT LEAST 10 FOOT HEAD OF WATER FOR A PERIOD OF NOT LESS THAN 15 MINUTES. TESTS SHALL BE PER UPC CHAPTER 7. TEST GAUGES SHALL BE PER UPC 318.

WATER PIPE INSULATION

- PRE-FORMED FIBERGLASS INFORMATION FOR PIPE, VALVES, FITTINGS, EQUIPMENT, AND ACCESSORIES.
- PROVIDE PER THE WSEC AND THE MIDWEST INSULATION CONTRACTORS ASSOCIATION (MICA) STANDARDS. INSULATION THICKNESSES SHALL COMPLY WITH WSEC.

PLUMBING - GENERAL

- PROVIDE PLUMBING PER THE UPC AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
- PLUMBING FIXTURES AND EQUIPMENT SHALL BE AS INDICATED ON THE DRAWING SCHEDULES.

PLUMBING - FLOOR DRAINS

- DRAINS SHALL BE JAY R. SMITH, SIOUX CHIEF, ZURN, WADE, OR APPROVED EQUAL.
- FLOOR DRAINS: DUCO CAST IRON BODY WITH FLASHING COLLAR, SQUARE POLISHED NICKEL BRONZE ADJUSTABLE STRAINER HEAD AND GRATE, TRAP PRIMER CONNECTION AND VANDAL PROOF SCREWS. SIZE AS PER PLANS.
- FLOOR SINKS: STAINLESS STEEL FLANGED RECEPTOR FABRICATED OF 304 STAINLESS STEEL WITH 12" HALF GRATE STAINLESS STEEL TOP, SEDIMENT BUCKET AND FLASHING CLAMP. SIZES AS SHOWN ON PLANS.
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

PLUMBING - CLEANOUTS

- CLEANOUTS SHALL BE JAY R. SMITH, SIOUX CHIEF, ZURN, WADE OR APPROVED EQUAL.
- WALL CLEANOUT: DUCO CAST IRON CAULK FERRULE WITH CAST IRON COUNTERSUNK CLOSURE PLUG. PROVIDE WITH STAINLESS STEEL COVER AND SCREW.
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

PLUMBING FIXTURE AND TRIM

- FIXTURES ARE SPECIFIED IN THE PLUMBING FIXTURE SCHEDULE AND ARE THE BASIS OF THIS DESIGN. SIMILAR FIXTURES OF EQUAL QUALITY CAN BE SUBMITTED UPON.
- PROVIDE STOP VALVES, WATER SUPPLY, TRAPS, TRAP ARMS, INSULATION, AND WASTE AS APPLICABLE AND INDICATED ON DRAWINGS.
- PROVIDE CARRIER AND/OR MOUNTING BRACKETS.
- PROVIDE ESCUTCHEON PLATES FOR ALL LINES THROUGH WALL OR FLOOR, UNLESS PLANS INDICATE A DIFFERENT PENETRATION.
- INSTALL FIXTURE PER MANUFACTURER'S RECOMMENDATIONS.

DOMESTIC WATER HEATERS

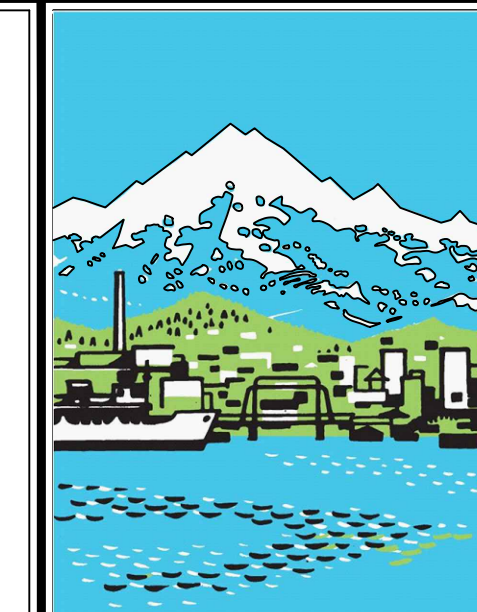
- TANK SHALL BE RATED AT 1.5 TIMES THE WORKING PRESSURE. WATER HEATER SHALL COMPLY WITH STATE AND LOCAL ENERGY CODES.
- PROVIDE HOUSEKEEPING PAD FOR TANK.
- PROVIDE ASME RATED PRESSURE RELIEF VALVE.
- INSTALL WATER HEATERS PER THE UPC AND MANUFACTURER'S RECOMMENDATIONS. PROVIDE CATCHPAN. DRAIN TO NEARBY SERVICE SINK.

PIPE INSULATION SCHEDULE							
FLUID OPERATING AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL OR TUBE SIZE (inches)				
	BTU · in./h · ft ² · °F	TEMPERATURE, °F	< 1	1 to 1-1/2	1-1/2 to < 4	4 to < 8	≥8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	75	0.5	1.0	1.0	1.0	1.5

GENERAL NOTES:

- FOR PIPING SMALLER THAN 1-1/2 INCH (38mm) AND LOCATED IN PARTITIONS WITHIN CONDITIONED SPACES, REDUCTION OF THESE THICKNESSES BY 1 INCH (25mm) SHALL BE PERMITTED (BEFORE THICKNESSES REQUIRED IN FOOTNOTE b) NOT TO A THICKNESS LESS THAN 1 INCH (25mm).
- FOR INSULATION OUTSIDE THE STATED CONDUCTIVITY RANGE, THE MINIMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:

$$T = r \{ (1 + t/r)^{k/f} - 1 \}$$
 WHERE:
 T = MINIMUM INSULATION THICKNESS,
 r = ACTUAL OUTSIDE RADIUS OF PIPE,
 t = INSULATION THICKNESS LISTED IN THE TABLE FOR APPLICABLE FLUID TEMPERATURE AND PIPE SIZE.
 K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATING TEMPERATURE INDICATED FOR THE APPLICABLE FLUID TEMPERATURE (Btu · in/h · ft² x °F)
 k = THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THE TABLE FOR THE APPLICABLE FLUID TEMPERATURE.
- FOR DIRECT-BURIED HEATING AND HOT WATER SYSTEM PIPING, REDUCTION OF THESE THICKNESSES BY 1-1/2 INCHES (38mm) SHALL BE PERMITTED (BEFORE THICKNESS ADJUSTMENT REQUIRED IN FOOTNOTE b) BY BUT NOT TO THICKNESS LESS THAN 1 INCH (25mm)



TACOMA PLUMBING & HEATING, INC.

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SPECIFICATIONS

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DESIGNED: BSM
DRAWN: RPG
REVIEWED: BSM
DATE: 8/20/2021

JOB NUMBER:
REVISION:

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8/20/2021

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