GENERAL NOTES

1. PLUMBING CONTRACTOR SHALL NOTIFY WATER COMPANY OF PROPOSED NEW SERVICES TIE INTO EXISTING STREET MAINS AND PAY COST FOR NEW SERVICES, HOOK-UP INSTALLATIONS AND WATER METERS.(UNLESS OTHERWISE NOTED ON PLANS.)
2. VERIFY EXACT LOCATION OF ALL EXISTING SITE PIPING, CABLES, ETC., BEFORE TRENCHING.
3. DIAGRAMMATICAL DRAWINGS. DO NOT SCALE PLUMBING FLOOR PLAN FOR EXACT LOCATION OF PIPE RUNS.
4. VERIFY ELECT. CHARACTERISTICS WITH ELECT. PLANS PRIOR TO BID OR MATERIAL PURCHASE.
5. VERIFY AND COORDINATE ROUGH-IN AND FIXTURE LOCATIONS WITH FIXTURES, ARCHITECT, MECHANICAL DRAWINGS PRIOR TO FABRICATION OR INSTALLATION OF PIPE.
6. VERIFY AND COORDINATE WITH STRUCTURAL DRAWINGS FOR EXACT LOCATION OF ALL FOUNDATION PENETRATIONS AND PROVIDE AS REQUIRED ALL NECESSARY SUPPORTS PER STRUCTURAL DETAIL.
7. SLOPE ALL WASTE LINES MIN. OF 1/4" PER FOOT OR AS REQUIRED BY LOCAL CODES.
8. PROVIDE AND INSTALL ALL INDIRECT WASTE DRAIN LINES FROM A.C. UNITS, AND COOLER COILS.
9. FLUSH VALVES, FAUCET STOPS, DRINKING FOUNTAINS, ETC. SHALL BE ADJUSTED TO THEIR NORMAL WORKING CONDITIONS.
10. PROVIDE AND INSTALL AN AUTO AIR VENT AT THE HIGH POINT OF THE HOT WATER LINE SYSTEM.
11. WORK SHALL NOT BE COVERED UNTIL IT HAS BEEN INSPECTED, TESTED AND APPROVED BY THE PLUMBING INSPECTOR AND OTHER GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
12. NOTIFY FIXTURE CONTRACTORS THAT PLUMBING ROUGH-INS HAVE BEEN INSTALLED FIVE DAYS PRIOR TO POURING SLAB OR FINISH MATERIAL COVERING PAVEMENT PIPING FOR THEIR APPROVAL.
13. ALL PENETRATIONS THRU STRUCTURAL FRAMING SHALL BE PRE-DRILLED PROVIDED NOT MORE THAN HALF OF THE FRAMING IS REMOVED. NOTCHING OF DOUBLE PLATES FOR A LARGER PIPE SIZE WILL BE ALLOWED WHERE MIN. 2-1/8" SPLICE SIDE PLATES ARE PROVIDED WITH TYPICAL NAILING OR BOLTING AS NOTED ON STRUCTURAL DRAWINGS FOR THAT PARTICULAR SECTION OF WALL.
14. LAVATORY FAUCETS SHALL BE EQUIPPED WITH AERATORS AND SHALL BE DESIGNED AND MANUFACTURED SO THAT THEY WILL NOT EXCEED A WATER FLOW RATE OF 0.5 GALLON PER MINUTE.
15. SELF-CLOSING OR SELF METERING FAUCETS SHALL BE INSTALLED ON LAVATORIES INTENDED TO SERVE THE TRANSIENT PUBLIC. METERED FAUCETS SHALL DELIVER NOT MORE THAN 0.2 GALLONS PER CYCLE PER USE.
16. FAUCETS FOR KITCHEN SINKS SHALL BE EQUIPPED WITH AERATORS AND SHALL BE DESIGNED AND MANUFACTURED SO THAT THEY WILL NOT EXCEED A WATER FLOW RATE OF 1.8 GALLONS PER MINUTE.
17. ALL CLEAN OUTS TO BE GAS TIGHT AND WATER TIGHT.
18. ALL FIXTURES IN HANDICAP RESTROOMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF CALIFORNIA HANDICAP CODE AND LOCAL HANDICAP CODES HAVING JURISDICTION.
19. ALL FIXTURES, EQUIPMENT, PIPING, AND MATERIALS SHALL BE LISTED. (CPC 301.1)
20. ALL PIPING SHALL BE SUPPORTED AT INTERVALS NOT TO EXCEED THOSE SHOWN IN CPC TABLE 313.6.
21. LAVATORY TAILPIECE AND HOT WATER LINES SHALL BE INSULATED OR COVERED PER 2016 CBC SECTION 11B-606.5.
22. EACH PLUMBING FIXTURE SHALL BE INDEPENDENTLY VALVE PER CODE.
23. INSTALL ALL PLUMBING TO AVOID INTERFERENCE WITH ELECTRICAL AND MECHANICAL EQUIPMENT AND STRUCTURAL FRAMING. NO WATER OR DRAIN LINES PERMITTED OVER OR UNDER ELECTRICAL PANELS.
24. ALL POTABLE WATER OUTLETS WITH HOSE ATTACHMENTS, SUCH AS HOSE BIBS, AND MOP SINKS ARE TO BE PROVIDED WITH A BACKFLOW I ANTI-SIPHON VALVE.
25. NEW OR REPAIRED POTABLE WATER SYSTEMS SHALL BE DISINFECTED PRIOR TO USE ACCORDING TO THE METHOD SET IN SEC. 609.9 OF CALIFORNIA PLUMBING CODE.
26. ALL REQUIRED CLEANOUTS SHOULD BE INSTALLED AS PER SEC. 707.0 & 719.0 OF THE CALIFORNIA PLUMBING CODE. AND PROVIDED WHERE NEEDED. NO CLEAN-OUT SPACING SHALL EXCEED 100 FT.
27. PLUMBING VENT THROUGH ROOF SHALL TERMINATE VERTICALLY NOT LESS THAN ONE (1) FOOT FROM ANY VERTICAL SURFACE AND NOT LESS THAN TEN (10) FEET HORIZONTALLY OR AT LEAST THREE (3) FEET ABOVE ANY WINDOW, DOOR, OPENING, AIR INTAKE OR SHAFT.
28. SANITARY WASTE VENTS SHALL RISE VERTICALLY TO A POINT NOT LESS THAN SIX (6) INCHES IN HEIGHT ABOVE THE FLOOD LEVEL RIM OF THE FIXTURE BEFORE BEING CONNECTED TO ANY OTHER VENT.
29. DRAINAGE PIPING SERVING FIXTURES WHICH HAVE FLOODWATER RIMS LOCATED BELOW THE ELEVATION OF THE NEXT UPSTREAM MANHOLE COVER OF THE SEWER SERVING SUCH DRAINAGE PIPING SHALL BE PROTECTED FROM BACKFLOW OF SEWAGE BY INSTALLING AN APPROVED TYPE BACKWATER VALVE.
30. VENT TERMINALS THAT TERMINATE THROUGH AN OUTSIDE WALL OF A BUILDING SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM AN OPERABLE OPENING IN AN ADJACENT BUILDING. THIS SHALL NOT APPLY TO OPERABLE OPENINGS THAT ARE NOT LESS THAN 2 FEET BELOW OR 25 FEET ABOVE THE ELEVATION OF THE VENT TERMINAL. (CPC SEC. 509.8.5)
31. INDIRECT WASTES LONGER THAN FIVE (5) FEET MUST BE TRAPPED, AND IF LONGER THAN FIFTEEN (15) FEET MUST BE TRAPPED AND VENTED INDIRECT WASTES FROM FOOD SERVICE EQUIPMENT MUST DISCHARGE TO RECEPTOR WITH A MINIMUM AIR-GAP OF ONE (1) INCH.
32. PRIMARY CONDENSATE PIPING TO TERMINATE AT TAILPIECE OF LAVATORY/SINK IN THE UNIT IT SERVES, FLOOR SINK OR DEDICATED ROOF TOP RECEPTOR. WITH 1/8 INCH PER FOOT SLOPE
33. SECONDARY CONDENSATE PIPING TO TERMINATE AT EXTERIOR OBSERVABLE LOCATION OR INTERIOR OVER LAVATORY/SINK.
34. CONDENSATE WATER FROM AIR CONDITIONING AND/ OR REFRIGERATION UNITS SHALL BE ROUTED TO A PROPER PLUMBING FIXTURE AND BE DISCHARGED TO THE SANITARY SEWER.
35. ALL MATERIALS USED IN NEW WATER SUPPLY SYSTEM, EXCEPT VALUES AND SIMILAR DEVICES SHALL BE OF A LIKE MATERIAL USED IN THE EXISTING BUILDING PIPING.
36. CONTRACTOR SHALL RUN CAMERA TO EXISTING SEWER TO VERIFY EXISTING CONDITIONS SUCH AS DEPTH, ROUTE, EXACT LOCATION & SLOPE BEFORE ANY PIPE INSTALLATION.
37. PROVIDE HEAT TRACE SYSTEM FOR HOT & COLD WATER PIPING WHEN DESIGN TEMPERATURE CONDITION DROPS BELOW 32°F OUTSIDE OF BUILDING. COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER REQUIREMENTS.
38. EACH VENT SHALL TERMINATE NOT LESS THAN 10 FEET FROM, OR NOT LESS THAN 3 FEET ABOVE, AN OPENABLE WINDOW, DOOR, OPENING, AIR INTAKE, OR VENT SHAFT, OR NOT LESS THAN 3 FEET IN EVERY DIRECTION FROM A LOT LINE, ALLEY AND STREET EXCEPTED. CPC906.2

MAX DISTANCE FROM HOT WATER MAIN TO FIXTURE

PIPE SIZE	GAL./FT.	MAX LENGTH TO FIXTURE IN FEET
1/2"	0.010	60
3/4"	0.023	26
1"	0.041	14.6
1 1/4"	0.064	9.3
1 1/2"	0.092	0.65

MUST COMPLY WITH THE FOLLOWING CODE SECTIONS

94.610.4.1.1 – THE HOT WATER SYSTEM SHALL NOT ALLOW MORE THAN 0.6 GALLONS OF WATER TO BE DELIVERED TO ANY FIXTURE BEFORE HOT WATER ARRIVES.

94.610.4.1.2 – WHERE A HOT WATER RECIRCULATION OR ELECTRIC RESISTANCE HEAT TRACE WIRE SYSTEM IS INSTALLED, THE BRANCH FROM THE RECIRCULATING LOOP OR ELECTRIC RESISTANCE HEAT TRACE WIRE TO THE FIXTURE SHALL CONTAIN A MAXIMUM OF 0.6 GALLONS. HOT WATER RECIRCULATION SYSTEM MAY INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
1. TIMER-INITIATED SYSTEMS.
2. TEMPERATURE SENSOR-INITIATED SYSTEMS.
3. OCCUPANCY SENSOR-INITIATED SYSTEMS.
4. OTHER SYSTEMS ACCEPTABLE TO THE DEPARTMENT.

MANDATORY MEASURES

1. SERVICE WATER HEATER SYSTEMS AND EQUIPMENT SHALL MEET THE APPLICABLE REQUIREMENTS OF THE APPLIANCE EFFICIENCY REGULATIONS AS REQUIRED BY SEC. 110.1 SEC. 110.3 (B)
2. SERVICE HOT WATER SYSTEMS WITH CIRCULATING PUMPS OR WITH ELECTRICAL HEAT TRACE SYSTEMS SHALL BE CAPABLE OF AUTOMATICALLY TURNING OFF THE SYSTEM. SEC. 110.3 (C) 2
3. INSTANTANEOUS WATER HEATERS WITH AN INPUT RATING GREATER THAN 6.8 KBTUH/HR (2 kW) SHALL HAVE ISOLATION VALVES ON BOTH COLD WATER SUPPLY AND HOT PIPE LEAVING THE WATER HEATER. HOSE BIBS OR OTHER FITTINGS SHALL BE INSTALLED ON EACH VALVE FOR FLUSHING THE WATER HEATER WHEN THE VALVES ARE CLOSED. SEC. 110.3 (C)3
4. LAVATORIES IN PUBLIC RESTROOMS SHALL HAVE CONTROLS THAT LIMIT THE WATER SUPPLY TEMPERATURES TO 110 F. SEC. 110.3 (C)3
5. PLUMBING FIXTURES AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE CALIFORNIA PLUMBING CODE, AND SHALL MEET THE APPLICABLE STANDARDS REFERENCED IN TABLE 1701.1 OF THE 2016 CALIFORNIA PLUMBING CODE AND IN CHAPTER 6 OF THIS CODE.
6. ALL WORK SHALL CONFORM TO ALL REQUIREMENTS OF STATE OF CALIFORNIA TITLE 24 REGARDLESS OF THE INFORMATION INDICATED ON THESE PLANS. IT IS THE RESPONSIBILITY OF THE INDIVIDUAL SUPERVISING THE CONSTRUCTION TO ENSURE THAT THE WORK IS DONE IN ACCORDANCE WITH CODE REQUIREMENTS PRIOR TO REQUESTING INSPECTION.
7. AS OF JANUARY 1, 2016, PLUMBING FIXTURES OR FITTINGS INTENDED TO DISPENSE WATER FOR HUMAN CONSUMPTION, WHICH CONTAIN MORE THAN 0.25% LEAD ARE NOT PERMITTED TO BE SOLD OR INSTALLED ANYWHERE WHITEN THE STATE OF CALIFORNIA. THESE DEVICES SHALL BE LISTED TO ANNEX G OF NSF/ ANSI 61 SECTION 116875 OR OTHER APPROVED TESTING STANDARD. EVIDENCE OF COMPLIANCE SHALL BE PRESENTED TO THE BUILDING INSPECTOR PRIOR TO FIELD INSPECTION (AB1953).

ENERGY NOTES

1. DOMESTIC HOT WATER HEATERS SHALL BE CERTIFIED AND LISTED BY THE CALIFORNIA ENERGY COMMISSION. EXCEPTION: NON-STORAGE TYPE ELECTRIC WATER HEATERS.
2. SERVICE WATER HEATING SYSTEM SHALL BE EQUIPPED WITH AUTOMATIC TEMPERATURE CONTROLS CAPABLE OF ADJUSTMENT FROM THE LOWEST TO THE HIGHEST ACCEPTABLE TEMPERATURE SETTING FOR THE INTENDED USE. AS LISTED IN TABLE 3, CHAPTER 54 OF THE 1987 ASHRAE HANDBOOK, HVAC SYSTEMS & APPLICATIONS VOLUME.
3. LAVATORY FAUCETS AND SINK (NOT INCLUDING SERVICE SINK FAUCET) SHALL MEET THE FLOW REQUIREMENTS OUTLINED IN THE APPLIANCE EFFICIENCY STANDARDS.
4. LAVATORIES IN PUBLIC RESTROOMS SHALL HAVE HOT WATER CONTROLS THAT
   1. MAXIMUM FLOW RATE (GPM): 0.5, OR 0.75 (WITH A DEVICE THAT LIMITS THE PERIOD OF WATER DISCHARGE I.E. FOOT SWITCH OR OCCUPANCY SENSOR).
   2. FLOW RATE (GAL./CYCLE) FOR SELF-CLOSING VALVES: 0.20) CIRCULATING) OR 0.5 (NON-CIRCULATING), OR 0.75 (WITH A DEVICE THAT LIMITS THE PERIOD OF WATER DISCHARGE I.E. FOOT SWITCH OR OCCUPANCY SENSOR).
   3. MAXIMUM OUTLET TEMPERATURE: 110° F.

CAST IRON PIPES SPECIFICATION

BELOW GRADE:
ALL WASTE, VENT, SEWER AND STORM LINES SHALL BE OF CAST IRON SOIL PIPE AND FITTINGS AND SHALL CONFORM TO THE REQUIREMENTS OF CICPI STANDARD 301*, ASTM A888* OR ASTM A74* FOR ALL PIPE AND FITTINGS. PIPE AND FITTING SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE AND MANUFACTURED BY AB&I, CHARLOTTE OR TYLER OR RECEIVE PRIOR APPROVAL OF THE ENGINEER.

ABOVE GRADE:
ALL WASTE, VENT, SEWER AND STORM DRAIN LINES SHALL BE OF CAST IRON SOIL PIPE AND FITTINGS AND SHALL CONFORM TO THE REQUIREMENTS OF CISPI STANDARD 301*, ASTM A888* OR ASTM A74* FOR ALL PIPE AND FITTINGS. PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE OR RECEIVE PRIOR APPROVAL OF THE ENGINEER.

BUILDING OR HOUSE SEWERS SHALL BE OF CAST IRON SOIL PIPE AND FITTINGS FROM THE BUILDING DRAIN TO POINT OF CONNECTING WITH THE CITY SEWER OR PRIVATE DISPOSAL PLANT. ALL PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF CISPI STANDARD 301* OR ASTM A74*. PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE AND MANUFACTURED BY AB&I, CHARLOTTE OR TYLER OR RECEIVE PRIOR APPROVAL OF THE ENGINEER.

JOINTS:
JOINTS FOR HUB-LESS PIPE AND FITTINGS SHALL CONFORM TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, THE CISPI STANDARD 301* AND LOCAL CODE REQUIREMENTS. HUB-LESS COUPLING GASKETS SHALL CONFORM TO ASTM STANDARD C-564*. JOINTS FOR HUB AND SPIGOT PIPE SHALL BE INSTALLED WITH COMPRESSION GASKETS CONFORMING TO THE REQUIREMENTS OF ASTM STANDARD C-564 OR SHALL BE INSTALLED WITH LEAD AND OAKUM

PIPE MATERIAL SCHEDULE

*PROVIDE ALTERNATE BID FOR PVC AND CPVC PIPING AND OBTAIN CITY APPROVAL PRIOR TO ORDERING

SERVICE	PIPE	FITTINGS	LOCATION
WASTE AND VENT	CAST IRON NO HUB (PVC OR ABS*) IF APPROVED BY CITY	CAST IRON NO HUB (PVC OR ABS*) IF APPROVED BY CITY	ABOVE GRADE BELOW GRADE
HOT AND COLD WATER	COPPER TYPE "L" HARD DRAWN OR *CPVC IF APPROVED BY CITY	WROUGHT COPPER OR *CPVC IF APPROVED BY CITY	ABOVE GRADE
HOT AND COLD WATER	COPPER TYPE "K" SOFT COPPER TUBING	WROUGHT SOLDER JOINT FITTINGS	BELOW GRADE
CONDENSATE DRAIN INDIRECT WASTE	COPPER TYPE "L" HARD DRAWN	WROUGHT SOLDER JOINT FITTINGS	ABOVE GRADE
GAS	SCHEDULE 40 BLACK STEEL	MALEABLE IRON	ABOVE GRADE

TABLE A5.303.2.3.1
2016 CAL GREEN CODE
MAX FIXTURE FLOW RATES

FIXTURE TYPE	BASELINE FLOW-RATE[2]
SHOWER HEADS	1.8 GPM @ 80 PSI
LAVATORY FAUCETS-NONRESIDENTIAL	0.5 GPM @ 60 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI
WASH FOUNTAINS	1.8 [RIM SPACE (IN.)/20 GPM @ 60 PSI]
METERING FAUCETS	0.20 GALLONS/CYCLE
METERING FAUCETS FOR WASH FOUNTAINS	.20 [RIM SPACE (IN.)/20 GPM @ 60 PSI]
GRAVITY TANK TYPE WATER CLOSETS	1.28 GALLONS/FLUSH
FLUSHOMETER TANK WATER CLOSETS	1.28 GALLONS/FLUSH
FLUSHOMETER VALVE WATER CLOSETS	1.28 GALLONS/FLUSH
ELECTROMECHANICAL HYDRAULIC WATER CLOSETS	1.28 GALLONS/FLUSH
URINALS	.125 GALLONS/FLUSH

SEE 2016 CAL GREEN CODE FOR MORE INFORMATION.

1. INCLUDES WATER CLOSETS WITH AN EFFECTIVE FLUSH RATE OF 1.12 GALLONS OR LESS WHEN TESTED PER ASME A 112.19.2 AND ASME A 112.19.14
2. SEE TABLE 5.503.2.3 FOR ADDITIONAL NOTES AND REFERENCES.
3. WHERE COMPLYING FAUCETS ARE UNAVAILABLE, AERATORS RATED AT 0.35 GPM OR OTHER MEANS MAY BE USED TO ACHIEVE REDUCTION.

PLAN CHECK NOTES

1. AT TIME OF PERMIT ISSUANCE, CONTRACTOR SHALL SHOW THEIR WORKERS COMPENSATION INSURANCE CERTIFICATE.
2. THE ISSUANCE OF A PERMIT SHALL NOT PREVENT THE OFFICIAL FROM REQUIRING THE CORRECTION OF ERRORS ON THESE PLANS OR FROM PREVENTING ANY VIOLATION OF THE CODES ADOPTED BY THE CITY, RELEVANT LAWS, ORDINANCE, RULES AND / OR REGULATIONS.
3. THIS PROJECT SHALL COMPLY W/ THE 2016 EDITION OF THE CALIFORNIA BUILDING CODE (T-24), WHICH ADOPTS, 2016 CMC, 2016 CPC, 2016 CEC AND THE 2016 CALIFORNIA GREEN CODE.
4. PLUMBING FIXTURES AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE 2016 CALIFORNIA PLUMBING CODE, AND SHALL MEET THE APPLICABLE STANDARDS REFERENCED IN TABLE 1401.1 OF THE CALIFORNIA PLUMBING CODE AND IN CHAPTER 6 OF THIS CODE.

PLUMBING FIXTURE CONNECTION SCHEDULE

CONTRACTOR TO COORDINATE AND VERIFY ALL FIXTURES WITH ARCHITECT PRIOR TO ORDERING OR BIDDING JOB PLUMBING FIXTURES SHALL NOT EXCEED THE MAXIMUM ALLOWABLE FLOW RATES AS STATED IN SECTION 4.303.1 OF THE CAL-GREEN CODE 2016

TAG	DESCRIPTION	MFR	MODEL	W	TRAP	V	CW	HW	SPECIFICATIONS
WC-1	WATER CLOSET	AMERICAN STANDARD	NO. 3461.001 MADRERA	4"	INT	2"	1¼"	–	AQUAMETER SIPHON JET, FLOOR MOUNTED, ELONGATED BOWL, WATER SAVER, COMPLETE WITH SLOAN NO. 111-1.28 FLUSH VALVE AND OLSONITE NO.95SSCT OPEN SEAT. MAX OF 1.28 GPF.
WC-2	WATER CLOSET	AMERICAN STANDARD	NO.2234.001 MADERA	4"	INT	2"	1¼"	–	AQUAMETER SIPHON JET, FLOOR MOUNTED, ELONGATED BOWL, WATER SAVER, COMPLETE WITH SLOAN NO. 111-1.28 FLUSH VALVE AND OLSONITE NO.95SSCT OPEN SEAT. MAX OF 1.28 GPF.
WC-3	WATER CLOSET	AMERICAN STANDARD	NO.2282.001 DEVORO	4"	INT.	2"	3/4"	–	AQUAMETER SIPHON JET, FLOOR MOUNTED, ELONGATED BOWL, WATER SAVER, COMPLETE WITH SLOAN NO. 111-1.28 FLUSH VALVE AND OLSONITE NO.95SSCT OPEN SEAT. MAX OF 1.28 GPF.
LAV-1	LAVATORY	BY ARCH.	BY ARCH.	1½"	1½"	1½"	½"	½"	0.5 GPM, OR METERING FAUCETS TO BE 0.2 GAL./CYCLE TRAP, STOPS & SUPPLIES.
LAV-2	LAVATORY	AMERICAN STANDARD	NO. 0496.221 OVALYN 11	1½"	1½"	1½"	½"	½"	19"X16", OVAL UNDER COUNTER MOUNTED, COMPLETE WITH A/S MOUNTING KIT, DELTA NO. 23C333 FAUCET. MAX 0.5 GPM, OR METERING FAUCETS TO BE 0.2 GAL./CYCLE TRAP, STOPS & SUPPLIES.
UR	URINAL	AMERICAN STANDARD	WASHBROOK 6590.001	2"	INT	2"	1¼"	–	WALL HUNG SIPHON JET, WATER SAVER COMPLETE WITH SLOAN NO. 186-0.125 FLUSH VALVE, WITH MAX OF 0.5 GPM.
MS	MOP SINK	CECO	NO.871 SERVICE SINK	2" / 3" / 4"	2"	2"	3/4"	3/4"	ENAMELED CAST IRON CORNER FLOOR MOUNTED, COMPLETE WITH CHICAGO NO. 897-RCF FITTING WITH INTEGRAL STOPS, PAIL HOOK, WALL BRACE AND VACUUM BREAKER.
KS	KITCHEN SINK	BY ARCH.	BY ARCH.	2" / 2" / 4"	1½"	1½"	½"	½"	WITH FAUCET BY ARCH., WITH GARBAGE DISPOSAL BAGER 1/3 HP. MAX 1.8 GPM AT 60 PSI.
TP	AUTOMATIC TRAP PRIMER	PPP INC.	PR-500 PRIME-RITE	–	–	–	½"	–	RUN ½" CW TO FLOOR DRAIN-MOUNT IN WALL BEHIND ACCESS PANEL.
FD	FLOOR DRAIN	J.R SMITH	2005	2"	2"	1½"	–	–	WITH TRAP PRIMER CONNECTION
WHA	WATER HAMMER ARRESTOR	J.R SMITH	5005	2"	2"	2"	½"	–	WITH ACCESS PANEL
FCO	FLOOR CLEANOUT	J.R SMITH	4023	2" / 3" / 4"	–	–	–	–	WITH NONSKID NICKEL BRONZE TOP OR EQUAL.
WCO	WALL CLEANOUT	J.R SMITH	4553	2" / 3" / 4"	–	–	–	–	WITH PRIME COATED STEEL COVER OR EQUAL.
DF	DRINKING FOUNTAIN	ELKAY	EZSTL8C	1 1/4"	1 1/4"	1½"	½"	½"	WALL MOUNTED, DUAL LEVEL , REFRIGERATED, STAINLESS STEEL, ADA APPROVED, COMPLETE WITH VANDAL -PROOF ACCESS PLATES, P-TRAPS AND MCGUIRE NO. LFHST02 STOP WITH RIGID SUPPLY.
CWH	CLOTHES WASHER HOOK UP	SHARK BITE	24763	–	–	–	3/4"	3/4"	WASHING MACHINE BOXES

PLUMBING EQUIPMENT SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	DESCRIPTION
WH 1	GAS FIRED TANK TYPE WATER HEATER	RHEEM	GPDV50 -47LP	50 GALLON STORAGE. 21-3/4" DIA. X 68-3/8" HIGH. 98 GPH RECOVERY @ 60°F RISE. 47,000 BTUH INPUT. APPROX. SHIPPING WEIGHT 210 LBS., APPROX. OPERATIONAL WEIGHT 630 LBS. INSTALL PER MANUF. REQUIREMENTS AND STANDARDS.
WH 2	GAS FIRED TANK TYPE WATER HEATER	BRADFORD WHITE	EF-60T-125E-3N(A)	60 GALLON STORAGE. 28-1/4" DIA. X 56-3/8" HIGH. 242 GPH RECOVERY @ 60°F RISE. 125,000 BTUH INPUT. APPROX. SHIPPING WEIGHT 570 LBS., APPROX. OPERATIONAL WEIGHT 1074 LBS. INSTALL PER MANUF. REQUIREMENTS AND STANDARDS.
EWH 3	ELECTRIC POINT OF USE WATER HEATER	EEMAX	SP3277	277V, 3KW, 1PHASE. INSTALL PER MANUF. REQUIREMENTS AND STANDARDS.
TMV 1	POINT OF USE THERMOSTATIC MIXING VALVE	WATTS	LFMMV	1/2"-1" LEAD FREE, INTEGRAL FILTER WASHERS AND CHECK VALVES. INSTALL AT ALL LAVATORIES AND HAND SINKS, WITH A MAXIMUM SET TEMP OF 108°F.
CP 1	RECIRCULATING PUMP	PUMP BELL & GOSSETT	SERIES 100	ELECTRICAL REQUIREMENTS: 1/12 H.P., 115V., 1 PHASE WITH AUTOMATIC TIMER KIT MODEL TC-1 AND AQUASTAT MODEL AQS-3/4.

TABLE 120.3-A
2016 CALIFORNIA ENERGY CODE
PIPE INSULATION THICKNESS TABLE

FLUID TEMP. RANGE, (°F)	CONDUCTIVITY RANGE (IN BTU-INCH PER HOUR PER SQUARE FOOT PER °F)	INSULATING MEAN RATING TEMP. (°F)	NOMINAL PIPE SIZE (IN INCHES) / INSULATION THICKNESS REQUIRED (IN INCHES): ⅜1	1 TO ⅜1.5	1.5 TO ⅜4	4 TO ⅜8	8 AND LARGER
SPACE HEATING HOT WATER SYSTEMS (STEAM, STEAM CONDENSATE AND HOT WATER HEATING AND DOMESTIC WATER SYSTEM)							
ABOVE 350	0.32 – 0.34	250	4.5	5.0	5.0	5.0	5.0
251 – 350	0.29 – 0.31	200	3.0	4.0	4.0	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	0.22 – 0.28	100	1.0	1.0	1.5	1.5	1.5
SPACE COOLING SYSTEMS (CHILLED WATER, REFRIGERANT AND BRINE)							
40 – 60	0.21 – 0.27	75	0.5	0.5	1.0	1.0	1.0
BELOW 40	0.2 – 0.2	50	1.0	1.5	1.5	1.5	1.5

2016 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS:

A. HOT WATER PIPING SHALL BE INSULATED AS PER ENERGY CONSERVATION STANDARDS, TABLE 120.3A.
B. INSULATION SHALL BE PROVIDED ON ALL HOT WATER AND CIRCULATING PIPING AND THE FIRST 5' ON THE COLD WATER FROM THE WATER HEATER.
C. INSTALL APPROVED TEMPERATURE MIXING VALVES AT PLUMBING FIXTURES THAT REQUIRE 110°F WATER PER CPC AND CA. ENERGY CODE.
D. ALL SERVICE WATER HEATING EQUIPMENT TO BE IN COMPLIANCE WITH THE MODEL ENERGY CODE REQUIREMENTS AND LABELED.
E. A CERTIFICATE OF INSTALLATION FORM FOR WATER HEATING SYSTEM PER 2016 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS SHALL BE SUBMITTED TO THE BUILDING DEPARTMENT AFTER THE INSTALLATION OF WATER HEATER(S) AND HOT WATER DISTRIBUTION SYSTEM(S).
F. WITHIN 90 DAYS AFTER THE ENFORCEMENT AGENCY ISSUES A PERMANENT FINAL OCCUPANCY PERMIT, THE BUILDER SHALL PROVIDE A RECORD DRAWINGS WITH COPIES OF THE COMPLETED, SIGNED, SUBMITTED COMPLIANCE DOCUMENTS; OPERATING AND MAINTENANCE INFORMATION FOR ALL APPLICABLE MATERIAL, COMPONENTS, AND DEVICES INSTALLED TO THE BUILDING OWNER AT OCCUPANCY.

FIELD VERIFY ALL CONDITIONS

DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.

THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.

BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

A.D.A COMPLIANCE NOTES

1. INSULATE EXPOSED HOT WATER AND WASTE PIPING WITH NEATLY PRE-FORMED INSULATION COVERS BY McGUIRE "PROWRAP", OR EQUAL.
2. FIXTURE MOUNTING HEIGHTS FOR THE PHYSICALLY DISABLED SHALL CONFORM TO THE AMERICANS WITH DISABILITIES ACT AND OTHER AUTHORITIES HAVING JURISDICTION.

PLUMBING LEGEND

SYMBOL	ABBREV.	DESCRIPTION	SYMBOL	ABBREV.	DESCRIPTION
WAF	WAF	SEWER/WASTE (ABOVE GRADE)	BFP	BFP	REDUCED PRESSURE BACKFLOW PREVENTER
	SS/W	SANITARY SEWER/WASTE (BELOW GRADE)	PRV	PRV	PRESSURE REDUCING VALVE
				–	PIPE CONTINUATION
	V	VENT		VTR	VENT THRU ROOF
				WHA	WATER HAMMER ARRESTER
CD	CD	CONDENSATE DRAIN		T.P.	AUTOMATIC TRAP PRIMER
	TP	TRAP PRIMER		FD	FLOOR DRAIN
	CW	COLD WATER		FS	FLOOR SINK (COORDINATE GRATE REQS)
	HW	HOT WATER		CP	RECIRCULATION PUMP
	HWR	HOT WATER RETURN		MV	MIXING VALVE
G	G	LOW PRESSURE NATURAL GAS		HW	HOT WATER SRUB-IN
MPG	MPG	MEDIUM PRESSURE GAS		CW	COLD WATER STUB-IN/HOSE BIBB
	UP	PIPE UP	(E)	EXIST.	EXISTING
	DN.	TEE DOWN/OR UP	(N)	NEW	NEW
	DN.	PIPE DOWN			KEY CONSTRUCTION NOTE
	FCO	FLOOR CLEANOUT	X"-Y		X"= PIPE SIZE Y = FIXTURE UNITS
	–	PIPE CAP		A.D.A.	AMERICAN DISABILITIES ACT
	WCO	WALL CLEANOUT		BTUH	BRITISH THERMAL UNITS PER HOUR
	B.W.V.	BACK WATER VALVE		CFH	CUBIC FEET PER HOUR (1 MBH = 1 CFH)
	SOV	SHUT-OFF VALVE		N.T.S.	NOT TO SCALE
	B.V.	BALANCING VALVE		I.E.	INVERT ELEVATION
	U	UNION		FU	FIXTURE UNITS
	GSOV	AUTOMATIC GAS SHUT-OFF VALVE		GPM	GALLONS PER MINUTE
	SOC	SHUT-OFF COCK (GAS)		GPH	GALLONS PER HOUR
S.W.	S.W.	SOFTENED WATER		HP	HORSEPOWER
F.W.	F.W.	FILTERED WATER		PSI	POUNDS PER SQUARE INCH
XCW	X.C.W.	EXISTING COLD WATER		FLR	FLOOR
XHW	X.H.W.	EXISTING HOT WATER		CLG	CEILING
XHWR	X.H.W.R.	EXISTING HOT WATER RETURN		ABV	ABOVE
XV	X.V.	EXISTING VENT		BEL	BELOW
XGW	X.G.W.	EXISTING GREASE WASTE		DN	DOWN
XSS/XW	X.W./X.S.S.	EXISTING WASTE/SANITARY SEWER		TYP.	TYPICAL
XG	X.G.	EXISTING NATURAL GAS		A.F.F.	ABOVE FINISH FLOOR
ED	ED	EMERGENCY DRAIN		KEC	KITCHEN EQUIPMENT CONTRACTOR
SSD	SSD	SUBSOIL DRAIN		B.F.F.	BELOW FINISH FLOOR
PSD	PSD	PUMPED STORM DRAIN		N.I.P.C.	NOT IN PLUMBING CONTRACT
PSS	PSS	PUMP SANITARY SEWER (PUMPED WASTE)		D.S.	DOWN SPOUT
	POC	POINT OF CONNECTION		MTD.	MOUNTED
	T&P	TEMPERATURE & PRESSURE RELIEF VALVE		TDL	TOTAL DEVELOPED LENGTH

SHEET INDEX

PLUMBING SCOPE OF WORK

CONTAINS OF:TENANT IMPROVEMENT FOR CHURCH, PROVIDE NEW PLUMBING PLUMBING FIXTURES AND RE-ROUTE UTILITIES.

PROJECT COMPLIANCES REQUIREMENTS

THIS PROJECT SHALL COMPLY WITH THE 2016 CALIFORNIA BUILDING CODE (CBC), 2016 CALIFORNIA MECHANICAL CODE (CMC), 2016 CALIFORNIA PLUMBING (CPC), 2016 CALIFORNIA ENERGY CODE (2013 BUILDING ENERGY EFFICIENCY STANDARDS), 2016 CALIFORNIA GREEN BUILDING CODE (CGBC), 2016 CRC, AND 2016 CEC .

CITY APPROVAL STAMP SECTION

NOTE: DO NOT FINALIZE BID ESTIMATE PRIOR TO PLAN CHECK APPROVAL.

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REVISIONS

DATE/DELTA	REMARKS

LANCASTER BAPTIST CHURCH
NORTH AUDITORIUM "KID CITY" IMPROVEMENTS
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SIAMAK GARESTANI
No. 26426
EXP. 9-30-19
MECHANICAL
STATE OF CALIFORNIA

SHEET TITLE:

PLUMBING NOTES, LEGEND, & SCHEDULE

SUB DATE

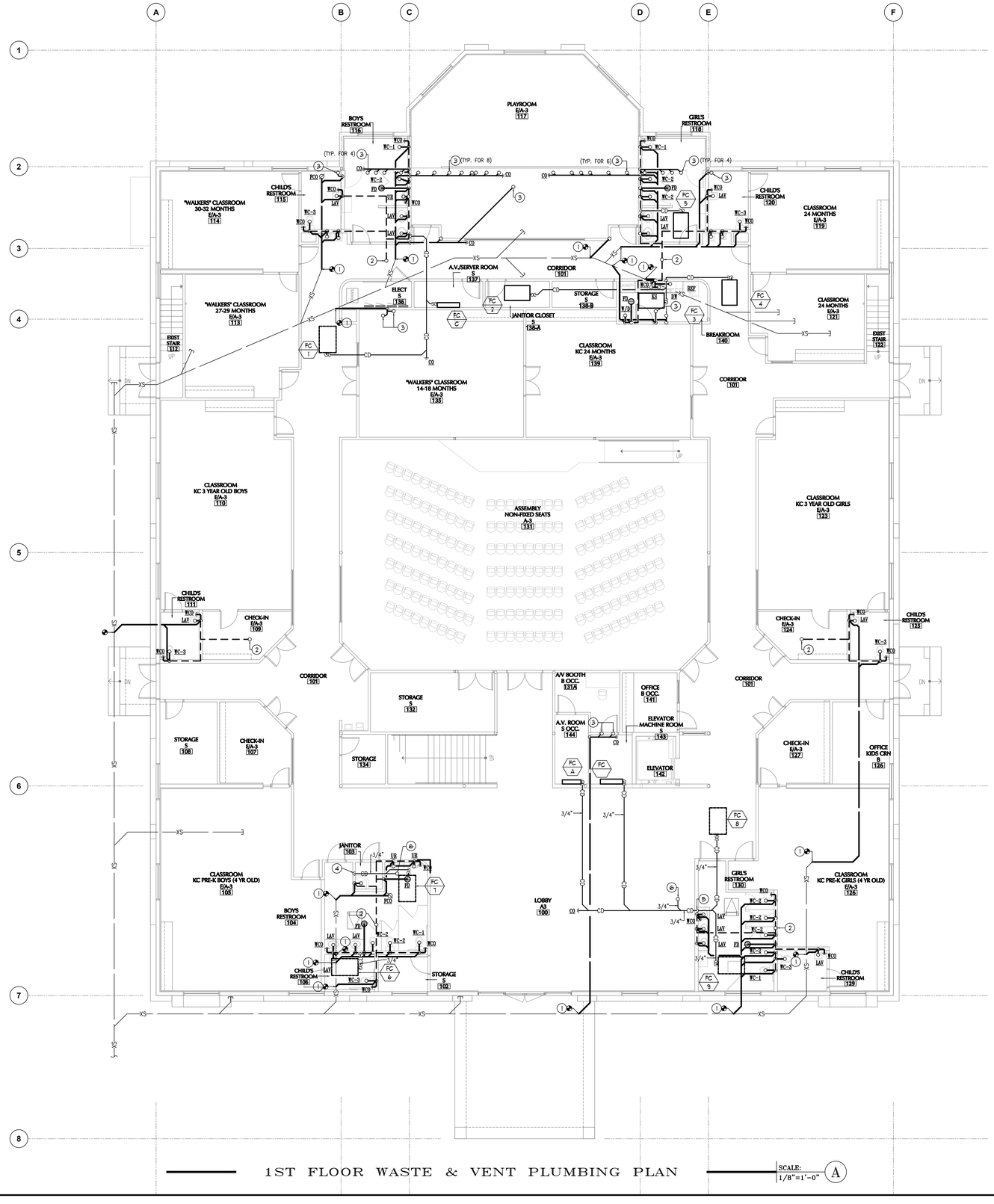
BID DATE

DATE: 05/08/2019
DRAWN BY: R.C./J.S.
JOB NO: 18-169
CHECKED BY: S.G

SHEET NUMBER:
P1.0

6/4/2019 7:47:49 AM

5/8/2019 7:39:10 PM



KEY CONSTRUCTION NOTES

1. MAKE P.O.C. TO EXISTING SANITARY WASTE WITH NEW WASTE PIPING. FIELD VERIFY ALL EXISTING CONDITIONS, SIZE, DEPTH AND LOCATION PRIOR TO START OF THIS WORK.
2. VENT UP TO 2ND FLOOR.
3. WASTE DOWN FROM 2ND FLOOR.
4. CONDENSATE DRAIN DOWN IN WALL SPILL AT MOP SINK TAILPIECE. SLOPE @ 1%.
5. CONDENSATE DRAIN DOWN IN WALL SPILL AT LAVATORY TAILPIECE. SLOPE @ 1%.
6. CONDENSATE DRAIN DOWN THRU ROOF.

GENERAL NOTES

CAP AND ABANDON ALL UNUSED SEWER PIPES.

1ST FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/8"=1'-0" (A)

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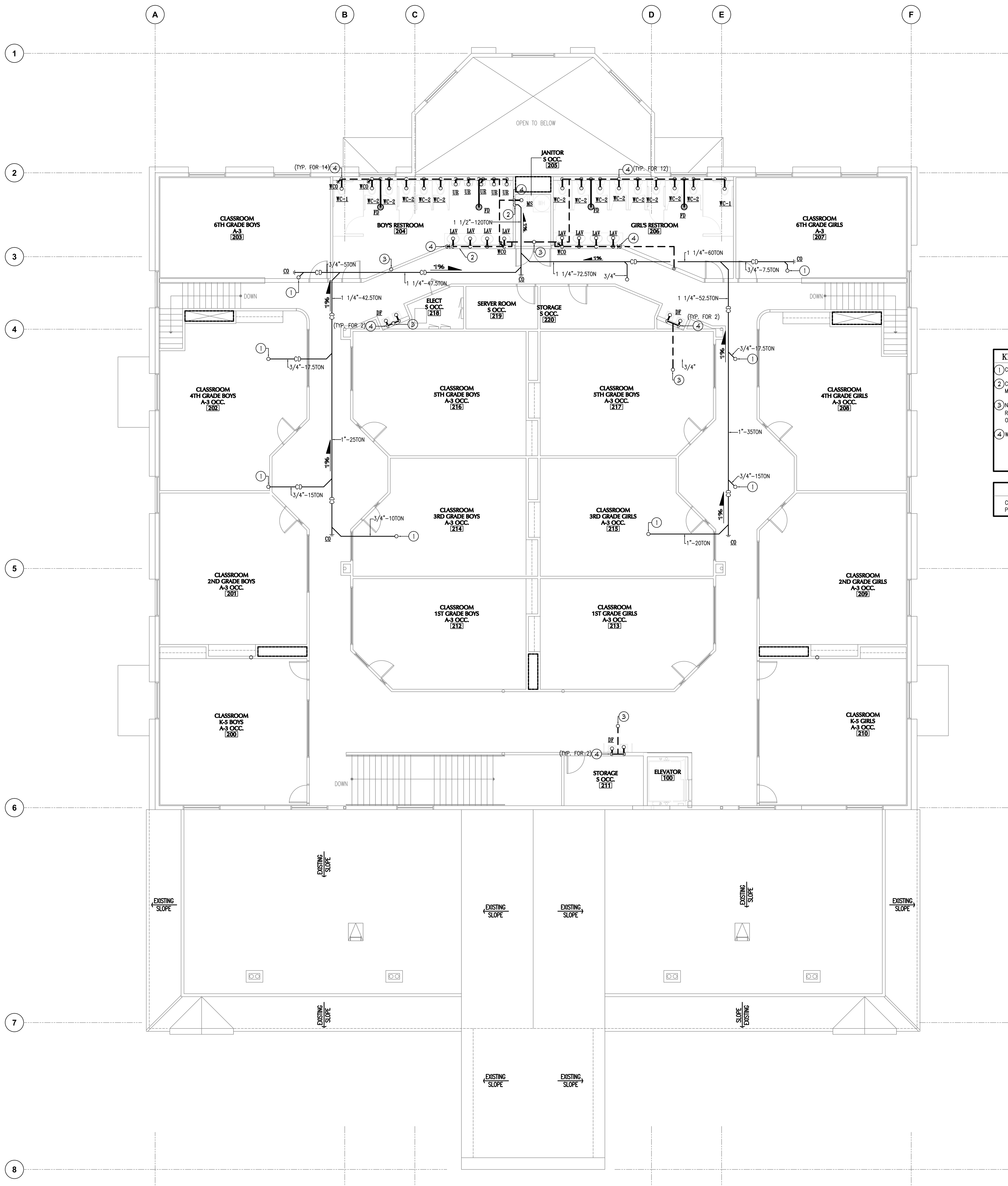
SHEET TITLE:

1ST FLOOR WASTE & VENT PLUMBING PLAN

SUB DATE	
BID DATE	
DATE:	05/08/2019
DRAWN BY:	R.C./J.S.
JOB NO:	18-169
CHECKED BY:	S.G

SHEET NUMBER: **P2.0**



2ND FLOOR WASTE & VENT PLUMBING PLAN — SCALE: 1/8"=1'-0" (B)

KEY CONSTRUCTION NOTES

1. CONDENSATE DRAIN DOWN THRU ROOF.
2. CONDENSATE DRAIN DOWN IN WALL SPILL AT MOP SINK. SLOPE @ 1%.
3. NEW VENT THRU ROOF. ENSURE VENT THRU ROOF IS AT LEAST 10'-0" AWAY FROM ALL OUTSIDE AIR INTAKES.
4. WASTE DOWN TO 1ST FLOOR.

GENERAL NOTES

CAP AND ABANDON ALL UNUSED SEWER PIPES.

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REVISIONS

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LANCASTER BAPTIST CHURCH

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SHEET TITLE:

2ND FLOOR WASTE & VENT PLUMBING PLAN

SUB DATE

BID DATE

DATE: 05/08/2019
DRAWN BY: R.C./J.S.
JOB NO: 18-169
CHECKED BY: S.G

SHEET NUMBER:
P2.1

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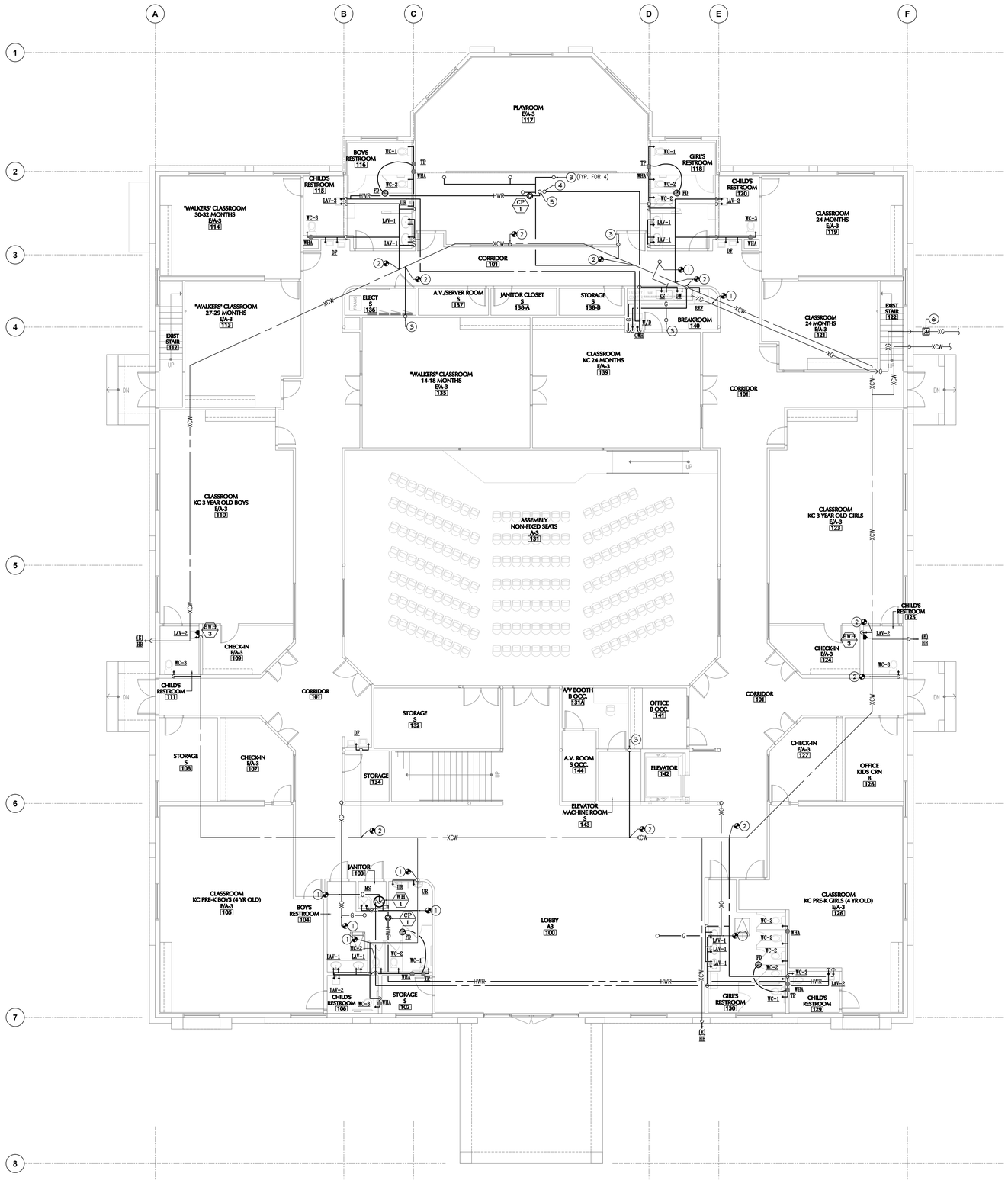

KEY CONSTRUCTION NOTES

1. MAKE P.O.C. TO EXISTING GAS WITH NEW GAS PIPING FIELD VERIFY ALL EXISTING CONDITIONS, SIZE AND LOCATION PRIOR TO START OF THIS WORK.
2. MAKE P.O.C. TO EXISTING CW. WITH NEW CW. PIPING FIELD VERIFY ALL EXISTING CONDITIONS, SIZE AND LOCATION PRIOR TO START OF THIS WORK.
3. COLD WATER LINE UP TO 2ND FLOOR.
4. HOT WATER LINE DOWN FROM 2ND FLOOR.
5. HOT WATER RETURN LINE UP TO 2ND FLOOR.
6. EXISTING GAS METER TO REMAIN.

GENERAL NOTES

CAP AND ABANDON ALL UNUSED WATER PIPES.

1ST FLOOR GAS & WATER PLUMBING PLAN

SCALE: 1/8"=1'-0" (C)

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LANCASTER BAPTIST CHURCH

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STATE OF CALIFORNIA

SHEET TITLE:

1ST FLOOR GAS & WATER PLUMBING PLAN

SUB DATE

BID DATE

DATE:	05/08/2019
DRAWN BY:	R.C./J.S.
JOB NO:	18-169
CHECKED BY:	S.G

SHEET NUMBER:

P2.2

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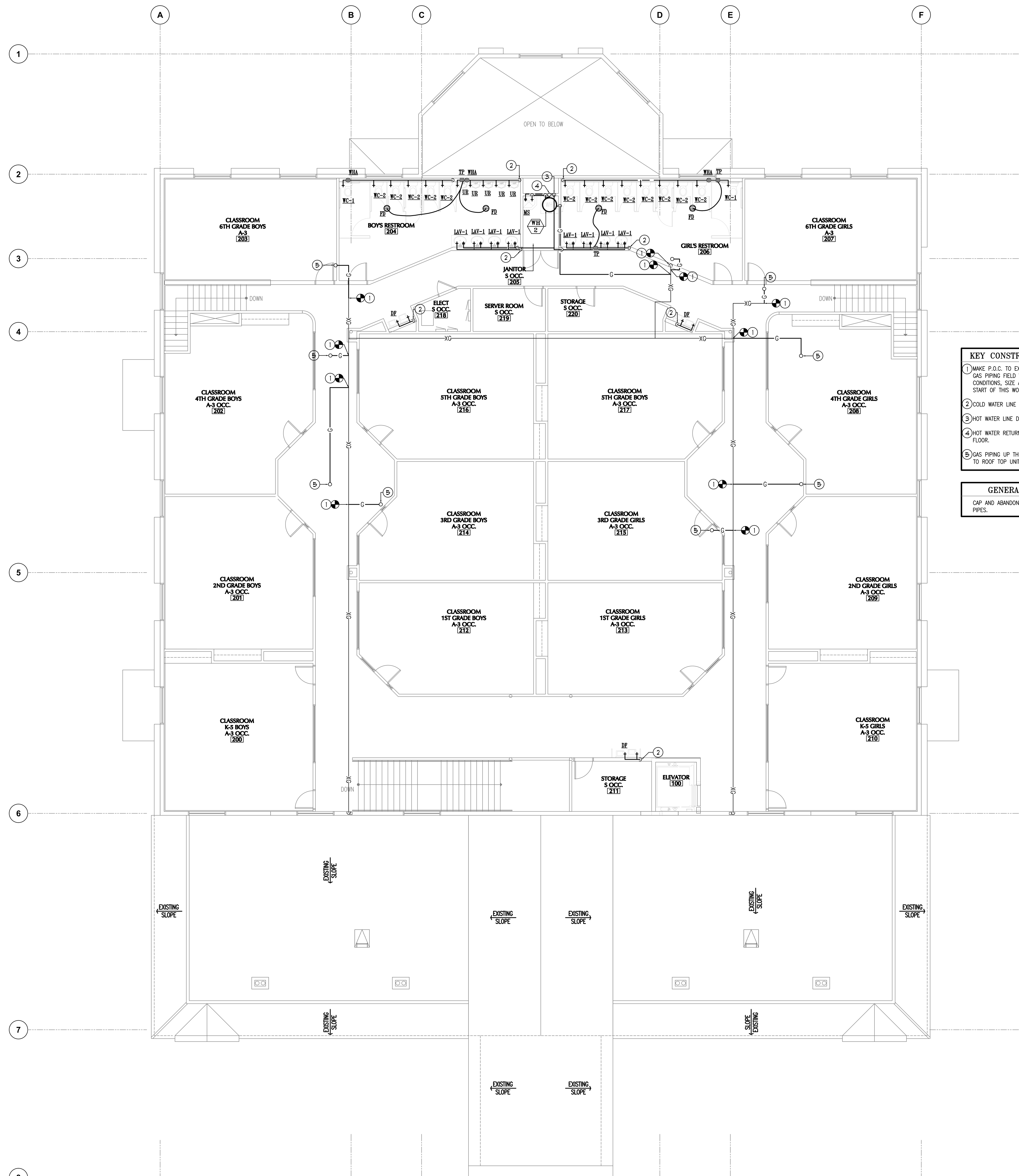

KEY CONSTRUCTION NOTES
(1) MAKE P.O.C. TO EXISTING GAS WITH NEW GAS PIPING FIELD VERIFY ALL EXISTING CONDITIONS, SIZE AND LOCATION PRIOR TO START OF THIS WORK.
(2) COLD WATER LINE DOWN TO 1ST FLOOR.
(3) HOT WATER LINE DOWN TO 1ST FLOOR.
(4) HOT WATER RETURN LINE DOWN TO 1ST FLOOR.
(5) GAS PIPING UP THRU ROOF AND CONNECT TO ROOF TOP UNIT.

GENERAL NOTES
CAP AND ABANDON ALL UNUSED WATER PIPES.

2ND FLOOR GAS & WATER PLUMBING PLAN

SCALE: 1/8"=1'-0" (D)

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REVISIONS

DATE/DELTA	REMARKS

LANCASTER BAPTIST CHURCH

NORTH AUDITORIUM "KID CITY" IMPROVEMENTS

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EXP. 9-30-19
MECHANICAL
STATE OF CALIFORNIA

SHEET TITLE:

2ND FLOOR GAS & WATER PLUMBING PLAN

SUB DATE

BID DATE

DATE:	05/08/2019
DRAWN BY:	R.C./J.S.
JOB NO:	18-169
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SHEET NUMBER:
P2.3

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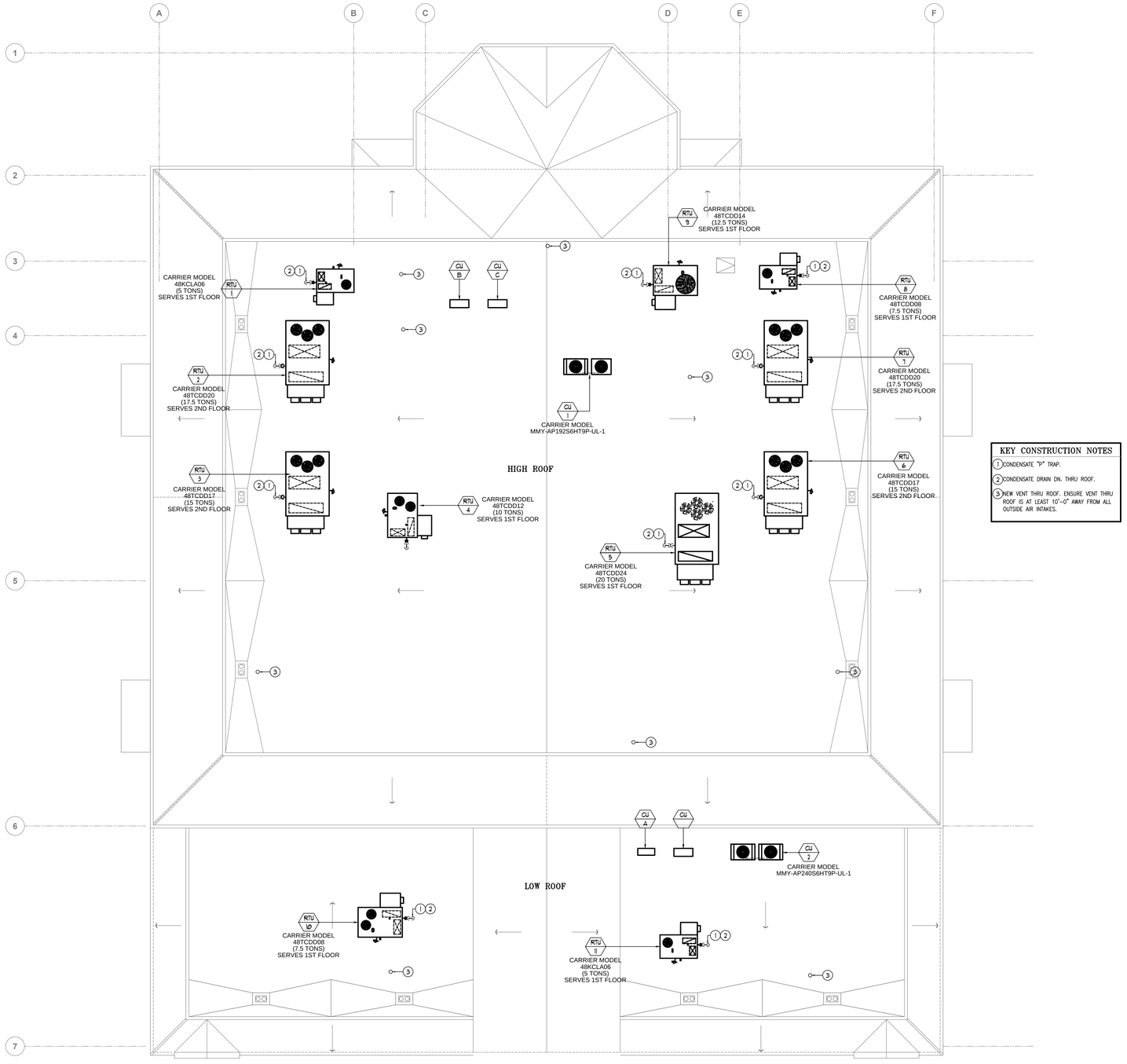

KEY CONSTRUCTION NOTES

1. CONDENSATE "P" TRAP.
2. CONDENSATE DRAIN DN. THRU ROOF.
3. NEW VENT THRU ROOF, ENSURE VENT THRU ROOF IS AT LEAST 10'-0" AWAY FROM ALL OUTSIDE AIR INTAKES.

PLUMBING ROOF PLAN

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

E

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LANCASTER BAPTIST CHURCH

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SHEET TITLE:

PLUMBING ROOF PLAN

SUB DATE

BID DATE

DATE:	05/08/2019
DRAWN BY:	R.C./J.S.
JOB NO:	18-169
CHECKED BY:	S.G

SHEET NUMBER:

P2.4

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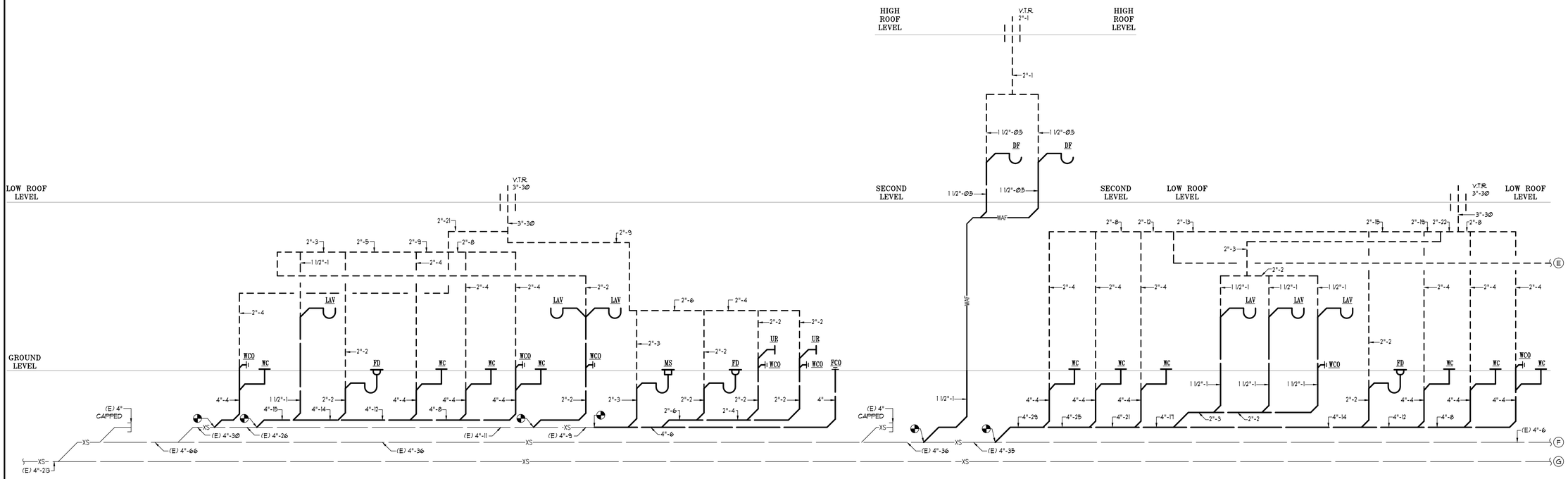
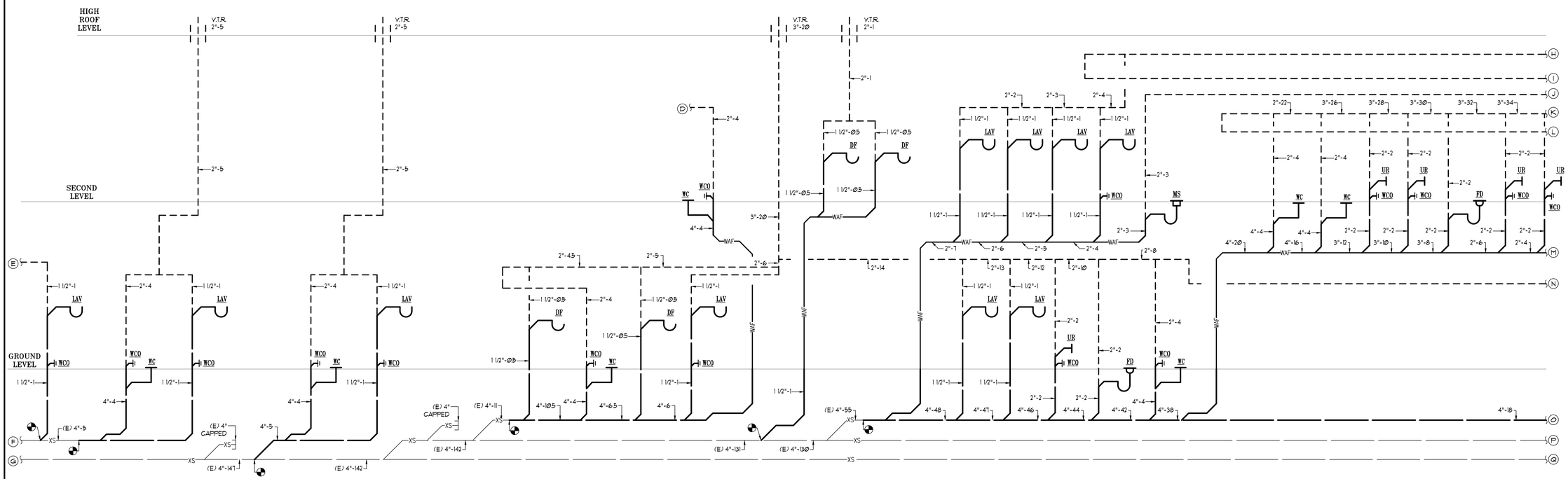


SANITARY WASTE & VENT RISER DIAGRAMS — SCALE: NONE — A



SANITARY WASTE & VENT RISER DIAGRAMS — SCALE: NONE — B

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REVISIONS

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LANCASTER BAPTIST CHURCH

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SHEET TITLE:

PLUMBING WASTE & VENT RISER DIAGRAMS

SUB DATE

BID DATE

DATE:	05/08/2019
DRAWN BY:	R.C./J.S.
JOB NO:	18-169
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P3.0

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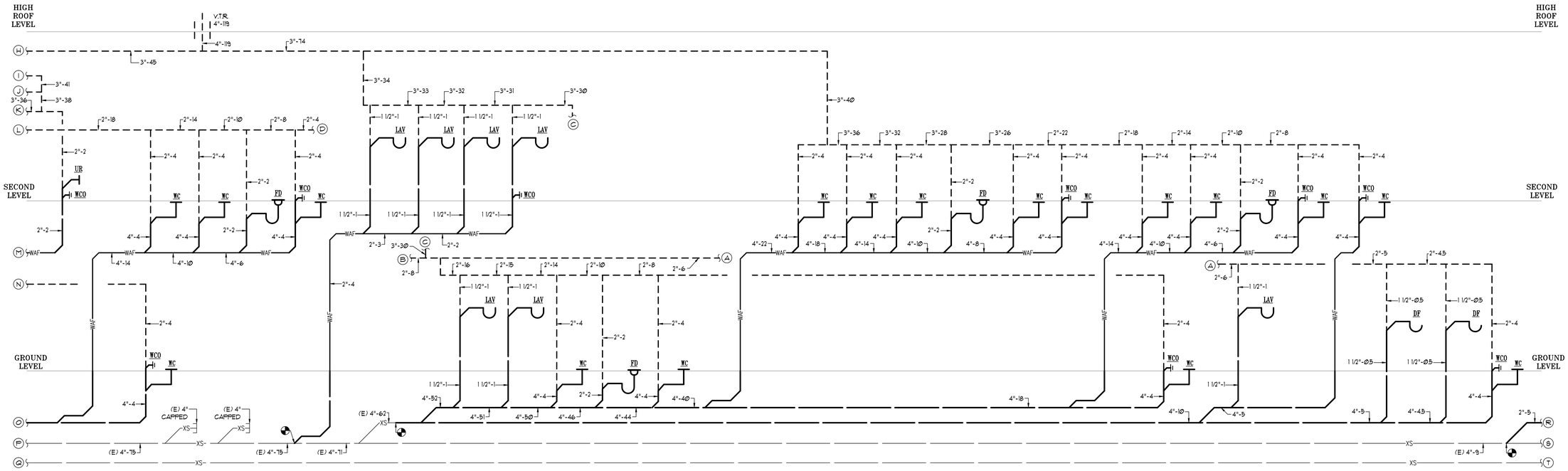
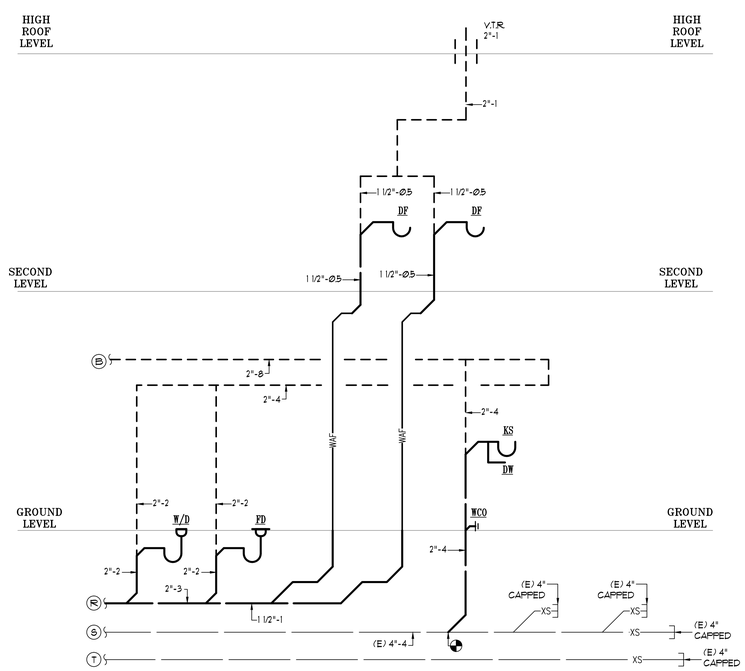


SANITARY WASTE & VENT RISER DIAGRAMS — SCALE: NONE — A



SANITARY WASTE & VENT RISER DIAGRAMS — SCALE: NONE — B

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REVISIONS

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LANCASTER BAPTIST CHURCH

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PLUMBING WASTE & VENT RISER DIAGRAMS

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DATE: 05/08/2019
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SHEET NUMBER:

P3.1

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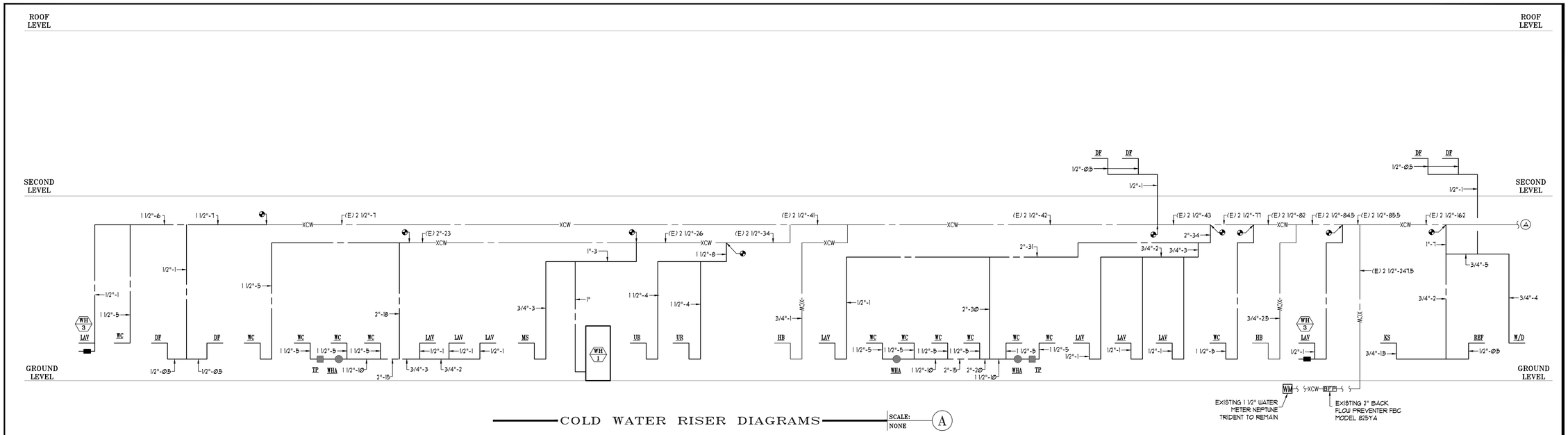
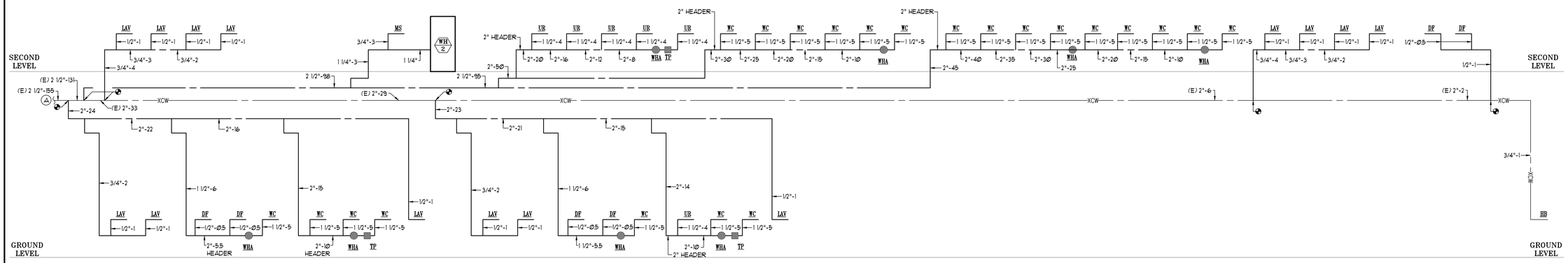


COLD WATER RISER DIAGRAMS — SCALE: NONE — A



COLD WATER RISER DIAGRAMS — SCALE: NONE — B

DOMESTIC COLD WATER CALCULATION

STREET MAIN TO FARTHEST OUTLET

A.	PRESSURE AVAILABLE:		MAXIMUM:	81	P.S.I.
			MINIMUM:	70	P.S.I.
B.	TOTAL FIXTURE UNITES:		1. NEW FLUSH VALVE:	249.0	F.U.
C.	WATER DEMAND:		1. DOMESTIC:	105.0	G.P.M.
D.	PRESSURE LOSS THRU	1 1/2"	WATER METER	13.0	P.S.I.
E.	PRESSURE LOSS THRU	2"	BFP	14.0	P.S.I.
F.	PRESSURE LOSS THRU		–	0.0	P.S.I.
G.	RESIDUAL PRESSURE REQUIRED AT FARTHEST OUTLET:			25.0	P.S.I.
H.	PRESSURE LOSS DUE TO HEIGHT	16.0	(IN FEET) X 0.434	6.9	P.S.I.
I.	TOTAL PRESSURE LOSS FROM ABOVE ITEMS "D" THROUGH "H"			58.9	P.S.I.
J.	MINIMUM PRESSURE AVAILABLE:			70	P.S.I.
K.	PRESSURE AVAILABLE FOR FRICTION LOSS: ITEM "J" MINUS RESULT OF ITEM "I" =			11.1	P.S.I.
L.	DEVELOPED PIPE LENGTH:				
			1. LENGTH OF RUN (MAIN TO LAST FIXTURE):	208	FT.
			2. EQUIVALENT LENGTH FOR FITTINGS: 0.25	52.0	FT.
			3. TOTAL DEVELOPED LENGTH:	260.0	FT.
M.	FRICTION LOSS PER ONE HUNDRED (100) FEET OF PIPE:				
	100 FEET X (K)	11.1	DIVIDE BY (L) 260.0	4.3	P.S.I./100'
			USE:	3.4	P.S.I./100'

FIXTURE UNIT COUNT

FIXTURE	TAG	QTY	CWFU EACH	TOTAL CWFU	HWFU EACH	TOTAL HWFU	DFU EACH	TOTAL DFU
WATER CLOSET (FV)	WC	34	5.0	170.00	0.00	0.00	4.00	136.00
CLOTHES WASHER	CW	1	4.0	4.00	4.00	4.00	3.00	3.00
LAVATORY	LAV	23	1.0	23.00	1.00	23.00	1.00	23.00
URINAL	UR	8	4.0	32.00	0.00	0.00	2.00	16.00
KITCHEN SINK	KS	1	1.5	1.50	1.50	1.50	2.00	2.00
MOP SINK	MS	2	3.0	6.00	3.00	6.00	3.00	6.00
DISHWASHER	DW	1	1.5	1.50	1.50	1.50	2.00	2.00
DRINKING FOUNTAIN	DF	12	0.5	6.00	0.00	0.00	0.50	6.00
REFRIGERATOR	REF	1	0.5	0.50	0.00	0.00	0.00	0.00
HOSE BIBB	HB	1	2.5	2.50	0.00	0.00	0.00	0.00
ADDITIONAL HOSE BIBBS	HB	2	1.0	2.00	0.00	0.00	0.00	0.00
			TOTAL CWFU	249.0	TOTAL HWFU	36.00	TOTAL DFU	194.00

PIPE SIZES BASED ON TYPE "L" COPPER @3.4 PSI/100 FT. VELOCITY NOT TO EXCEED 8 FT. PER SECOND FOR COLD WATER AND 5 FEET PER SECOND HOT WATER			
	FIXTURE UNITS		
PIPE SIZE	HOT WATER	FLUSH TANK	FLUSH VALVE
1/2"	1	1	0
3/4"	6	6	0
1"	13	13	0
1 1/4"	26	26	0
1 1/2"	46	51	12
2"	119	175	76
2 1/2"	245	406	270

HOT WATER DEMAND FOR WH-1

FIXTURE	TAG	QTY	X	GPH	=	TOTAL GPH
MOP SINK	MS	1	X	15	=	15
LAVATORY	LAV	7	X	5	=	35
				TOTAL GPH =		50
50	TOTAL GPH	X	0.75	(DIVERSITY FACTOR)	=	37.5
FORMULA FOR GAS WATER HEATERS (BTU INPUT)						
37.5	GPH REQUIRED X 80' X 11 =			33,000	BTU INPUT REQUIRED	

HOT WATER DEMAND FOR WH-2

FIXTURE	TAG	QTY	X	GPH	=	TOTAL GPH
KITCHEN SINK	0	1	X	10	=	10
MOP SINK	0	1	X	15	=	15
CLOTHES WASHER	0	1	X	25	=	25
DISHWASHER	0	1	X	37	=	37
LAVATORY	0	16	X	5	=	80
				TOTAL GPH =		167
167	TOTAL GPH	X	0.75	(DIVERSITY FACTOR)	=	125.3
FORMULA FOR GAS WATER HEATERS (BTU INPUT)						
125.3	GPH REQUIRED X 80' X 11 =			110,220	BTU INPUT REQUIRED	

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REVISIONS

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LANCASTER BAPTIST CHURCH

NORTH AUDITORIUM "KID CITY" IMPROVEMENTS

4020 LANCASTER BLVD.
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REGISTERED PROFESSIONAL ENGINEER
SUMAN GARESHANI
No. 26426
EXP. 9-30-19
MECHANICAL
STATE OF CALIFORNIA

SHEET TITLE:

PLUMBING COLD WATER RISER DIAGRAMS

SUB DATE

BID DATE

DATE: 05/08/2019
DRAWN BY: R.C./J.S.
JOB NO: 18-169
CHECKED BY: S.G

SHEET NUMBER:

P3.2

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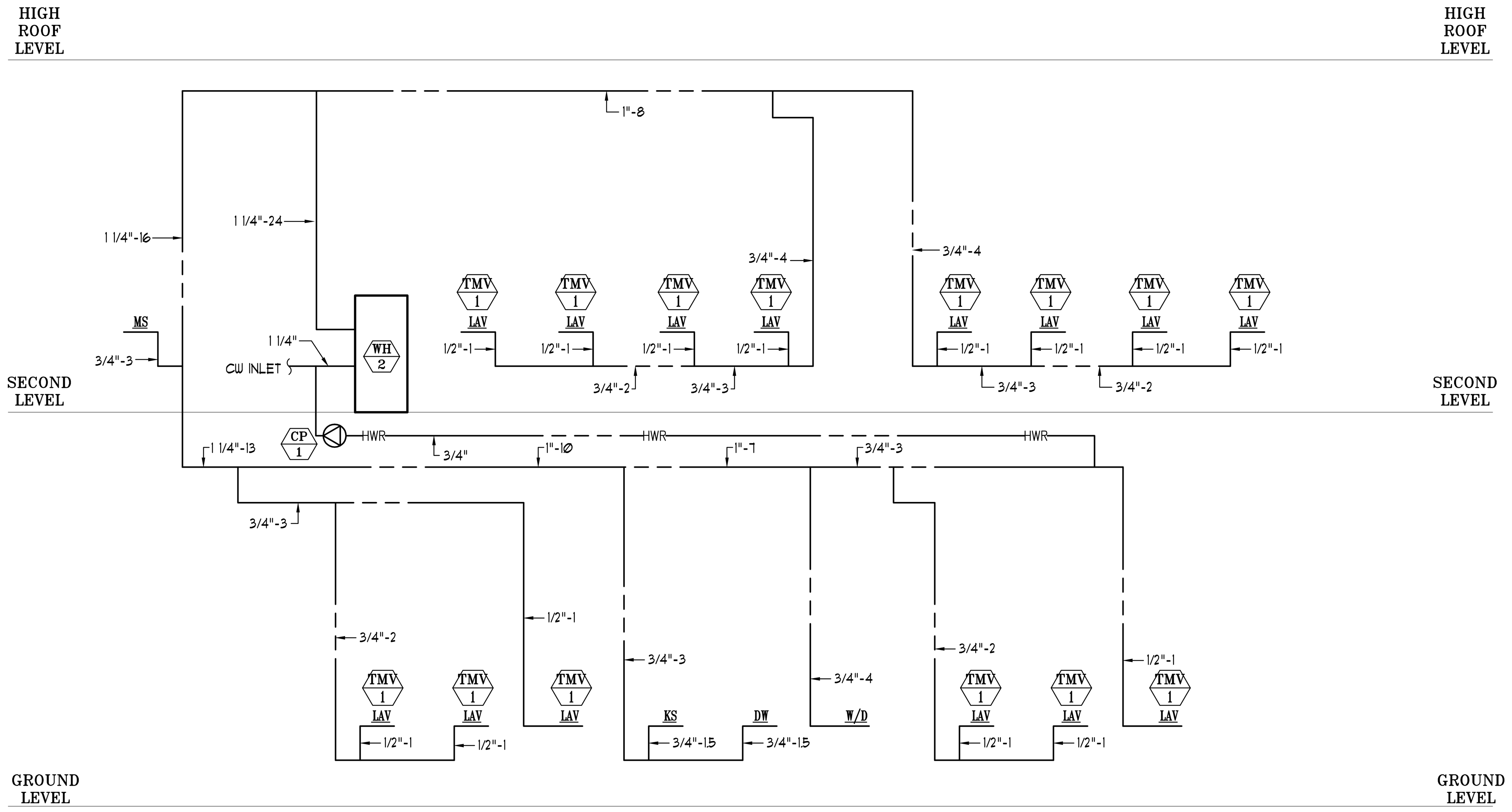
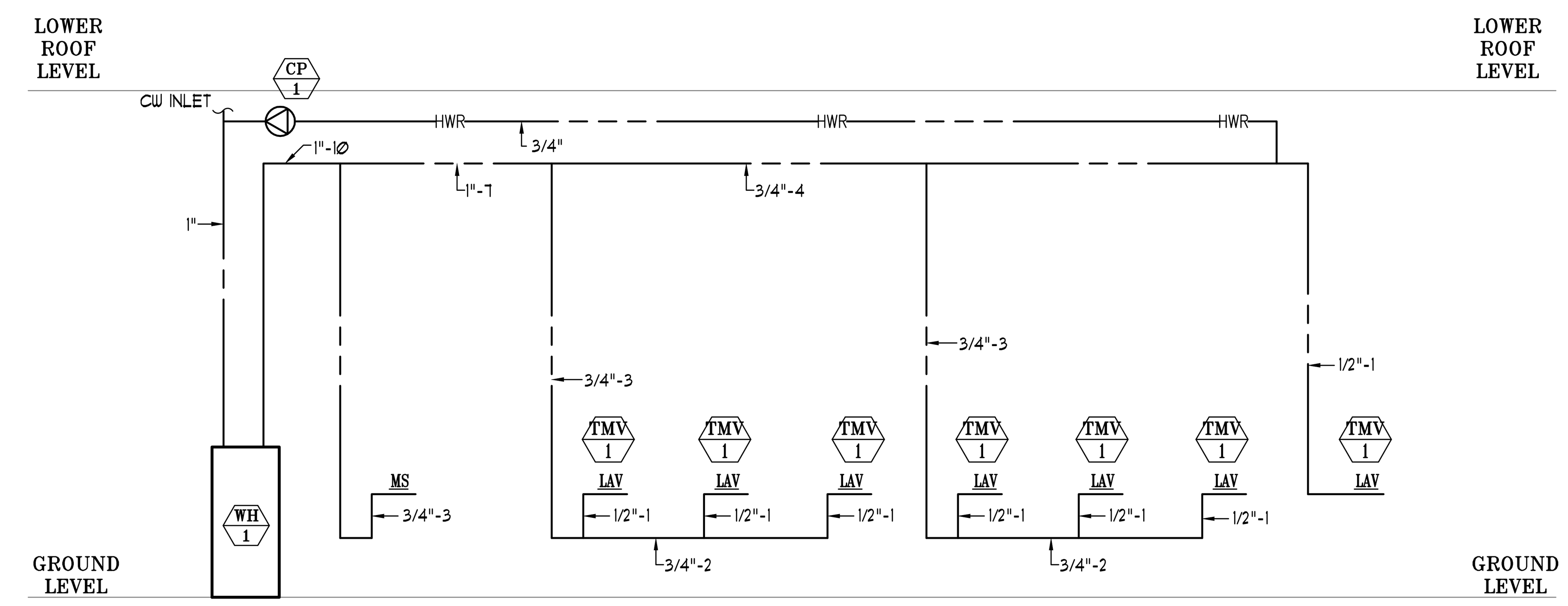
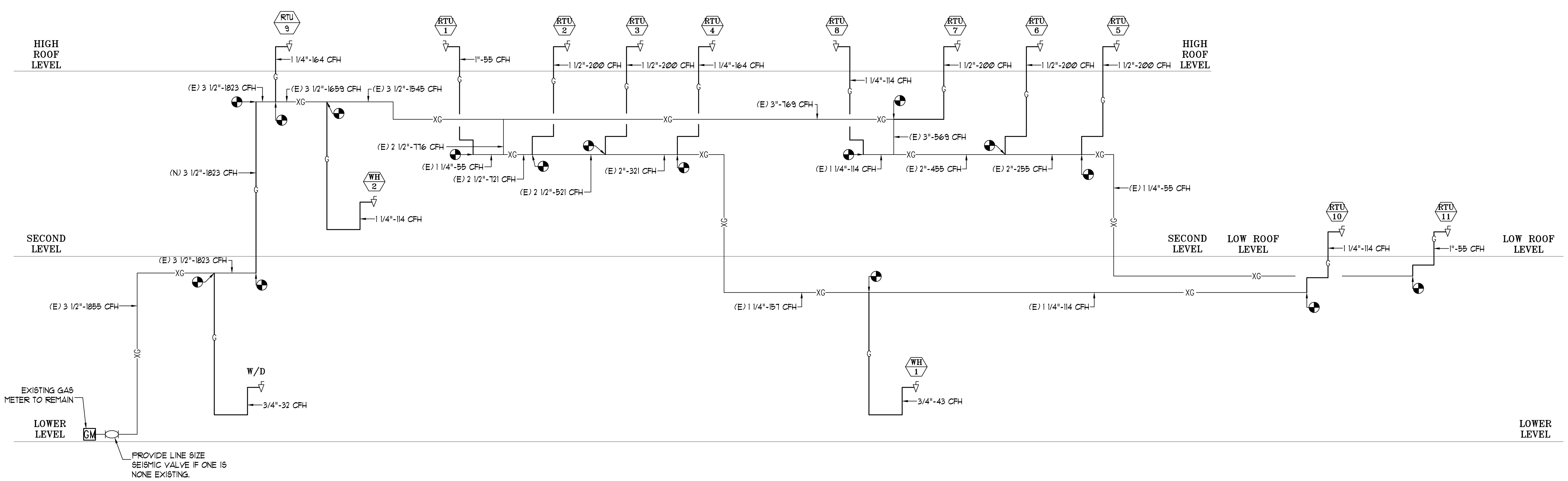


HOT WATER RISER DIAGRAMS — SCALE: NONE (A)



HOT WATER RISER DIAGRAMS — SCALE: NONE (B)

PIPE SIZES BASED ON TYPE "L" COPPER @3.4 PSI/100 FT. VELOCITY NOT TO EXCEED 8 FT. PER SECOND FOR COLD WATER AND 5 FEET PER SECOND HOT WATER			
	FIXTURE UNITS		
PIPE SIZE	HOT WATER	FLUSH TANK	FLUSH VALVE
1/2"	1	1	0
3/4"	6	6	0
1"	13	13	0
1 1/4"	26	26	0
1 1/2"	46	51	12
2"	119	175	76
2 1/2"	245	406	270



GAS RISER DIAGRAMS — SCALE: NONE (C)

GAS SIZING TABLE

TAG	DESCRIPTION	PIPE SIZE	CFH EA.	QTY.	CFH TOTAL
WH-1	WATER HEATER 1	3/4"	43	1	43
WH-2	WATER HEATER 2	1 1/4"	114	1	114
RTU1	ROOF TOP UNIT 1	1"	55	1	55
RTU2	ROOF TOP UNIT 2	1 1/2"	200	1	200
RTU3	ROOF TOP UNIT 3	1 1/2"	200	1	200
RTU4	ROOF TOP UNIT 4	1 1/4"	164	1	164
RTU5	ROOF TOP UNIT 5	1 1/2"	200	1	200
RTU6	ROOF TOP UNIT 6	1 1/2"	200	1	200
RTU7	ROOF TOP UNIT 7	1 1/2"	200	1	200
RTU8	ROOF TOP UNIT 8	1 1/4"	114	1	114
RTU9	ROOF TOP UNIT 9	1 1/4"	164	1	164
RTU10	ROOF TOP UNIT 10	1 1/4"	114	1	114
RTU11	ROOF TOP UNIT 11	1"	55	1	55
D	DRYER	3/4"	32	1	32
				TOTAL:	1855

LENGTH IN FEET	PIPE SIZE									
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
350	25	53	94	203	305	587	935	1650	2525	3370

GAS SIZING SYSTEM IS BASED ON A TOTAL DEVELOPED LENGTH OF 342 FEET. INCLUDES 20% FOR FITTINGS. SEE GAS SIZING TABLE FOR EQUIPMENT SIZES. BASED ON LESS THAN 2.0 P.S.I. INLET PRESSURE. 0.5 IN W.C. PRESSURE DROP.

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REGISTERED PROFESSIONAL ENGINEER
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MECHANICAL
STATE OF CALIFORNIA

SHEET TITLE:

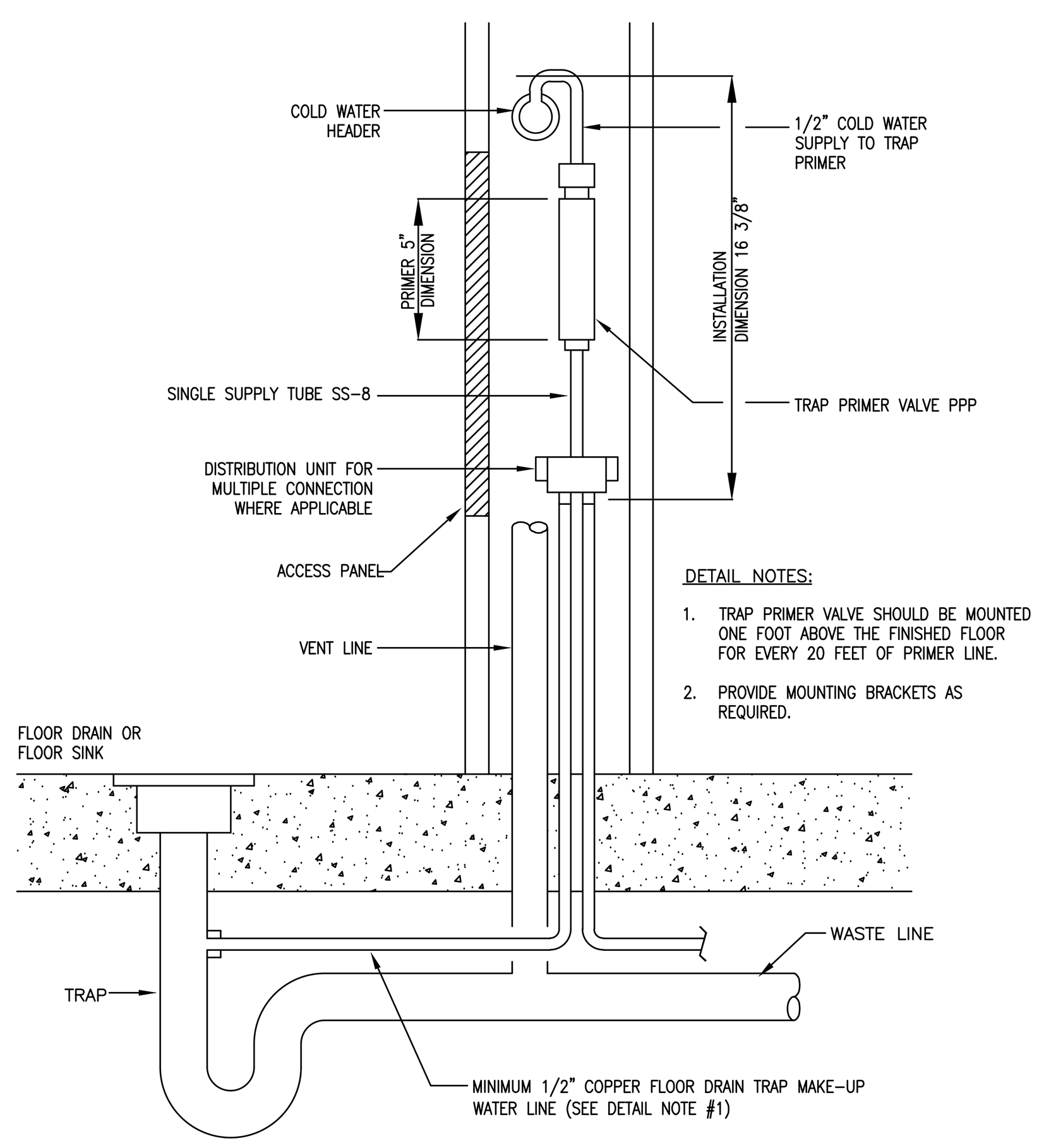
PLUMBING HOT WATER & GAS RISER DIAGRAMS

SUB DATE

BID DATE

DATE: 05/08/2019
DRAWN BY: R.C./J.S.
JOB NO: 18-169
CHECKED BY: S.G

SHEET NUMBER:
P3.3

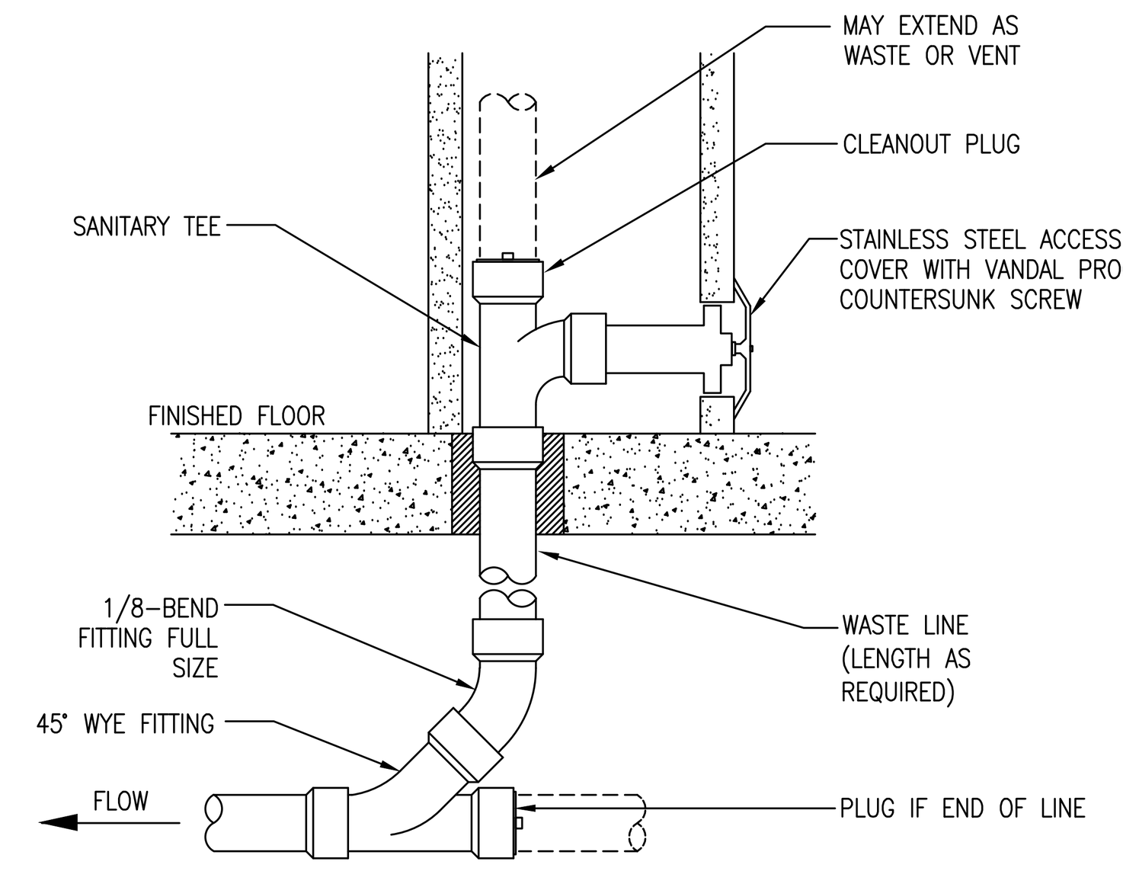

COLD WATER HEADER
1/2" COLD WATER SUPPLY TO TRAP PRIMER
PRIMER 5" DIMENSION
INSTALLATION DIMENSION 16 3/8"
SINGLE SUPPLY TUBE SS-8
TRAP PRIMER VALVE PPP
DISTRIBUTION UNIT FOR MULTIPLE CONNECTION WHERE APPLICABLE
ACCESS PANEL
VENT LINE
FLOOR DRAIN OR FLOOR SINK
WASTE LINE
TRAP
MINIMUM 1/2" COPPER FLOOR DRAIN TRAP MAKE-UP WATER LINE (SEE DETAIL NOTE #1)

DETAIL NOTES:

1. TRAP PRIMER VALVE SHOULD BE MOUNTED ONE FOOT ABOVE THE FINISHED FLOOR FOR EVERY 20 FEET OF PRIMER LINE.
2. PROVIDE MOUNTING BRACKETS AS REQUIRED.

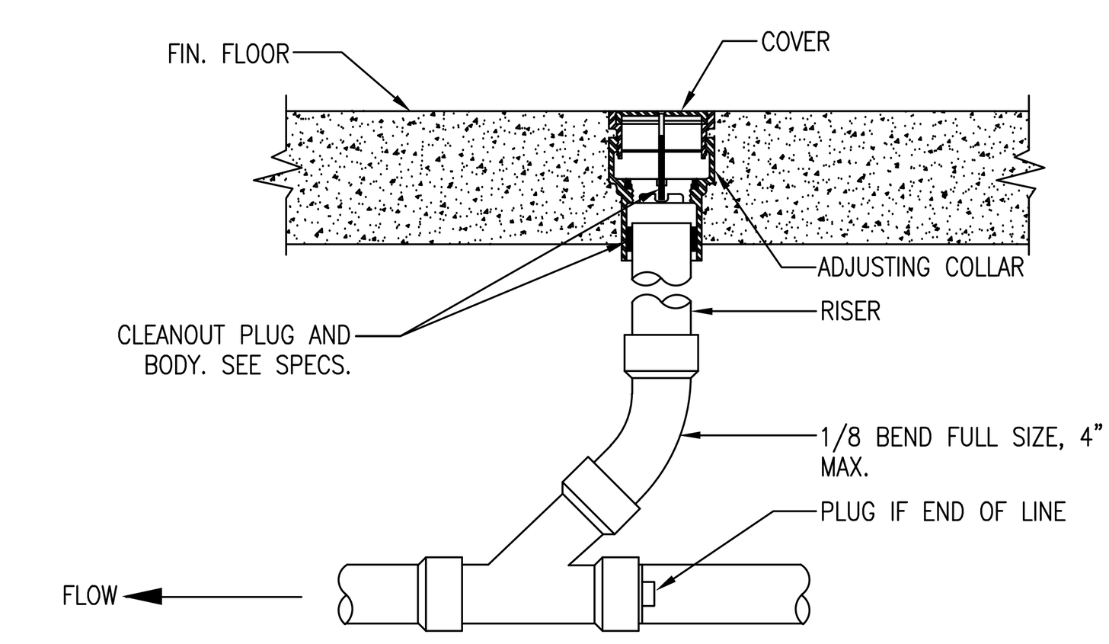
TRAP PRIMER DETAIL

SCALE: NONE (1)



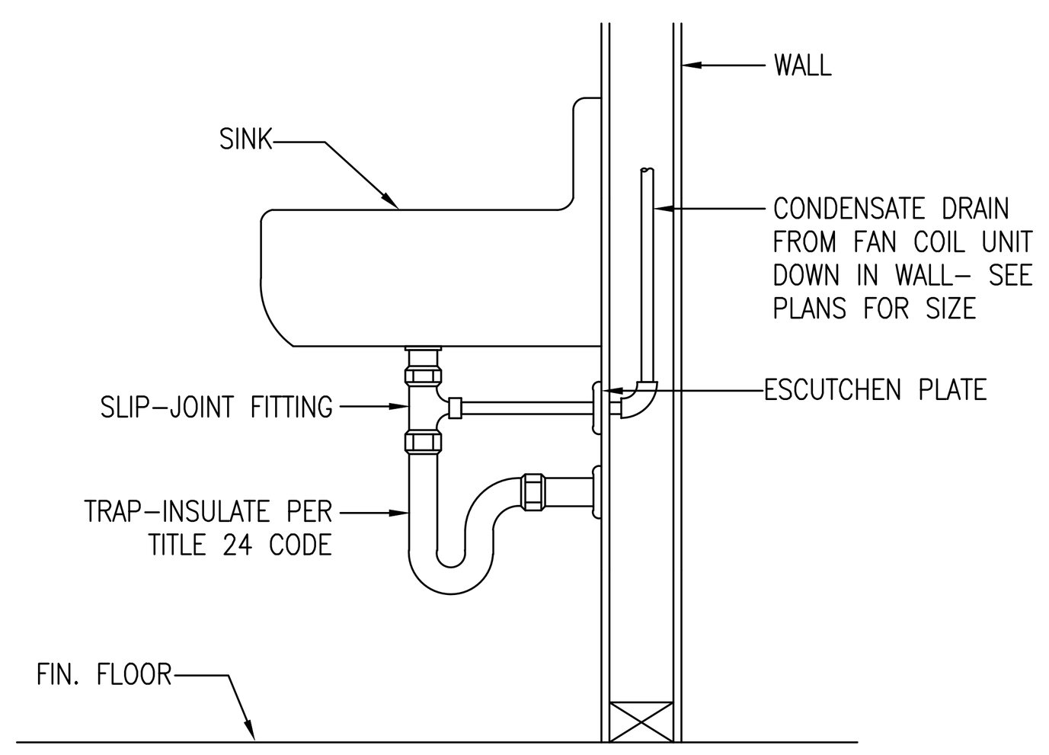
WALL CLEAN OUT DETAIL

SCALE: NONE (2)



FLOOR CLEANOUT DETAIL

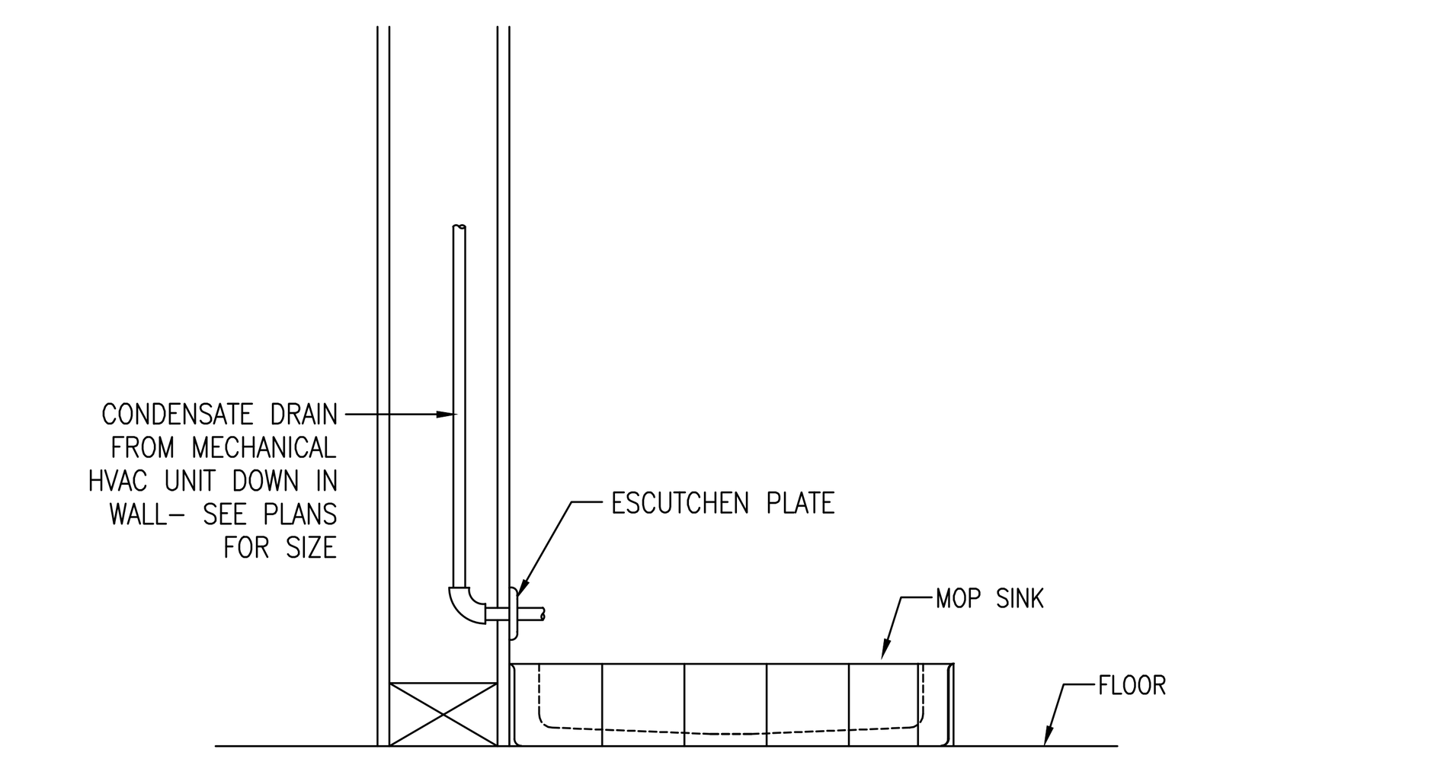
SCALE: NONE (3)



807.2 WHERE CONDENSATE WASTE FROM AIRCONDITIONING COILS DISCHARGES BY DIRECT CONNECTION TO A LAVATORY TAILPIECE OR TO AN APPROVED ACCESSIBLE INLET ON A BATHTUB OVERFLOW, THE CONNECTION SHALL BE LOCATED IN THE AREA CONTROLLED BY THE SAME PERSON CONTROLLING THE AIRCONDITIONED SPACE.

CONDENSATE CONNECTION TO SINK TAILPIECE

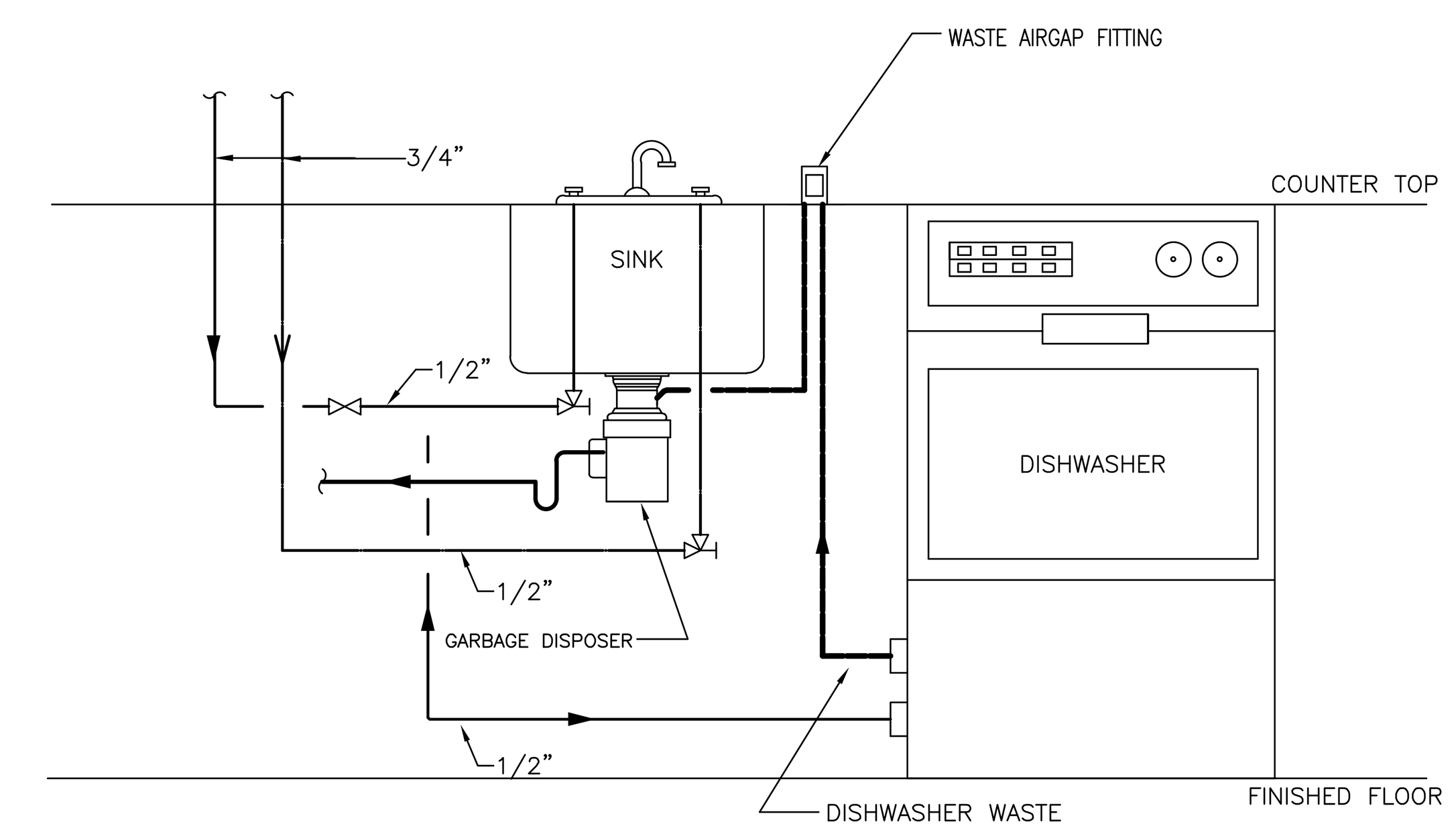
SCALE: NONE (4)



807.2 WHERE CONDENSATE WASTE FROM AIRCONDITIONING COILS DISCHARGES BY DIRECT CONNECTION TO A LAVATORY TAILPIECE OR TO AN APPROVED ACCESSIBLE INLET ON A BATHTUB OVERFLOW, THE CONNECTION SHALL BE LOCATED IN THE AREA CONTROLLED BY THE SAME PERSON CONTROLLING THE AIRCONDITIONED SPACE.

CONDENSATE DRAIN TO MOP SINK

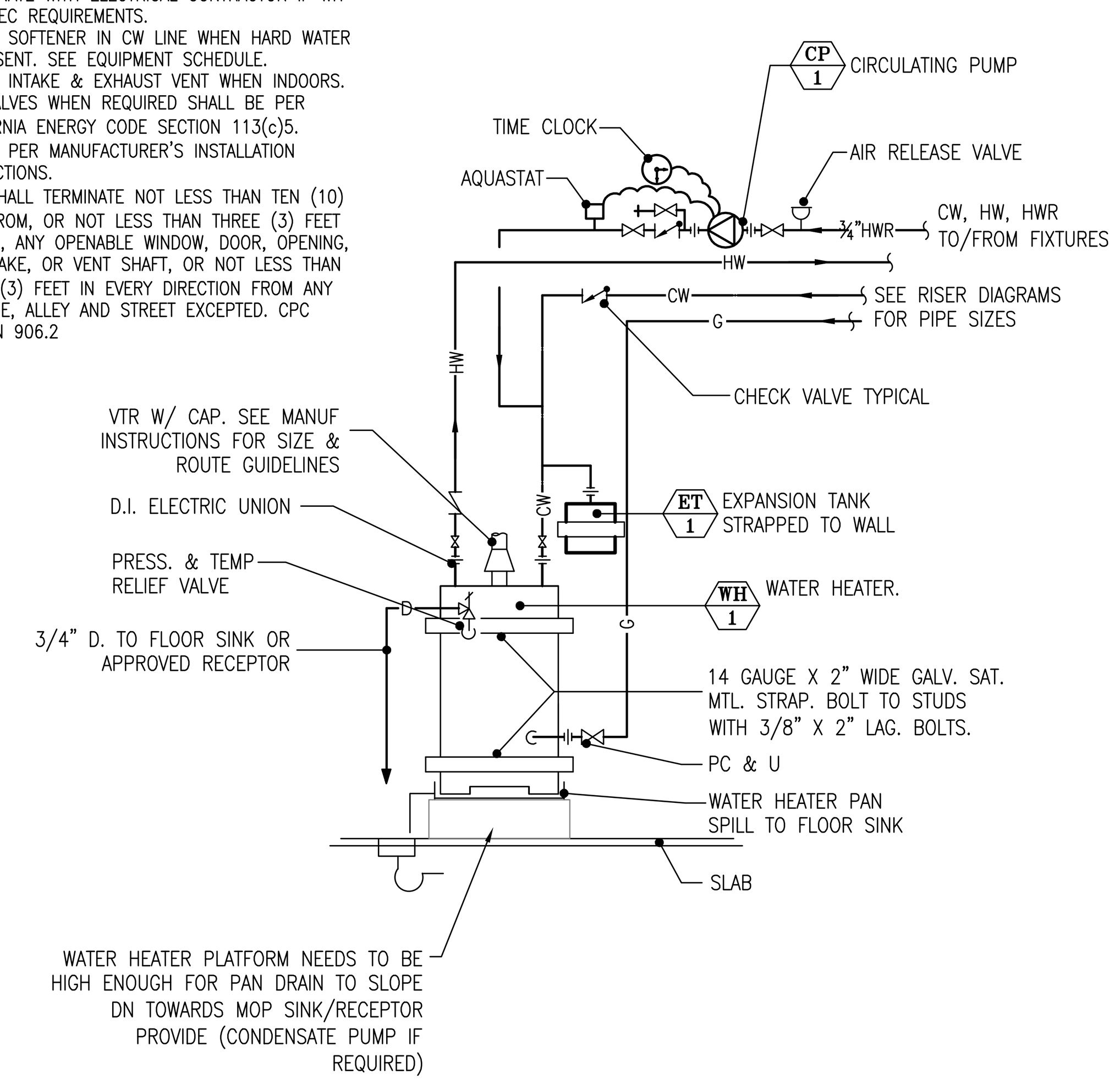
SCALE: NONE (5)



DISHWASHER AIR GAP DETAIL

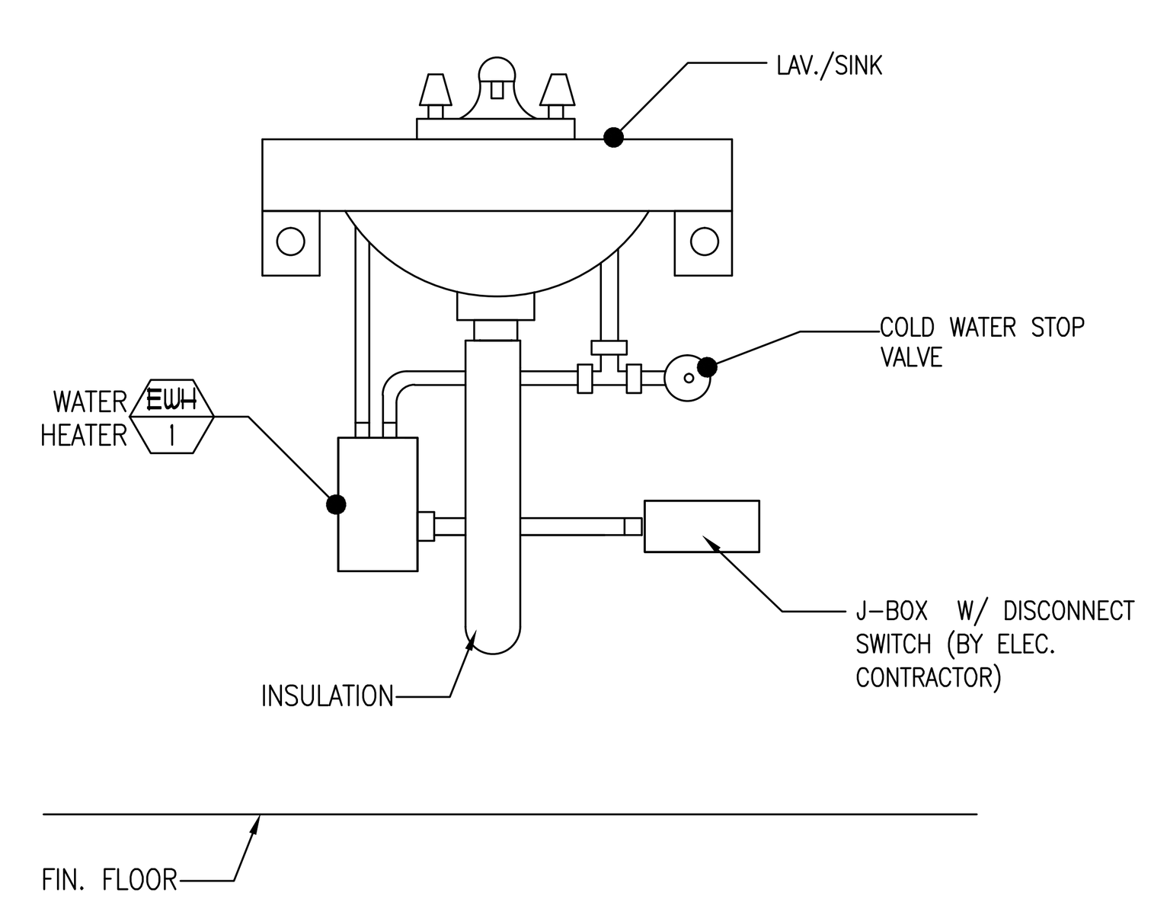
SCALE: NONE (6)

NOTES:
1. VERIFY WITH STRUCTURAL ENGINEER PRIOR TO INSTALLATION.
2. COORDINATE WITH ELECTRICAL CONTRACTOR IF WH HAS ELEC REQUIREMENTS.
2. INSTALL SOFTENER IN CW LINE WHEN HARD WATER IS PRESENT. SEE EQUIPMENT SCHEDULE.
3. INSTALL INTAKE & EXHAUST VENT WHEN INDOORS.
4. HWR VALVES WHEN REQUIRED SHALL BE PER CALIFORNIA ENERGY CODE SECTION 113(c)5.
5. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. VENT SHALL TERMINATE NOT LESS THAN TEN (10) FEET FROM, OR NOT LESS THAN THREE (3) FEET ABOVE , ANY OPENABLE WINDOW, DOOR, OPENING, AIR INTAKE, OR VENT SHAFT, OR NOT LESS THAN THREE (3) FEET IN EVERY DIRECTION FROM ANY LOT LINE, ALLEY AND STREET EXCEPTED. CPC SECTION 906.2


CP 1 CIRCULATING PUMP
TIME CLOCK
AQUASTAT
AIR RELEASE VALVE
¾"HWR
CW, HW, HWR TO/FROM FIXTURES
HW
CW
G
SEE RISER DIAGRAMS FOR PIPE SIZES
CHECK VALVE TYPICAL
VTR W/ CAP. SEE MANUF INSTRUCTIONS FOR SIZE & ROUTE GUIDELINES
D.I. ELECTRIC UNION
ET 1 EXPANSION TANK STRAPPED TO WALL
PRESS. & TEMP RELIEF VALVE
WH 1 WATER HEATER.
3/4" D. TO FLOOR SINK OR APPROVED RECEPTOR
14 GAUGE X 2" WIDE GALV. SAT. MTL. STRAP. BOLT TO STUDS WITH 3/8" X 2" LAG. BOLTS.
PC & U
WATER HEATER PAN SPILL TO FLOOR SINK
SLAB
WATER HEATER PLATFORM NEEDS TO BE HIGH ENOUGH FOR PAN DRAIN TO SLOPE DN TOWARDS MOP SINK/RECEPTOR PROVIDE (CONDENSATE PUMP IF REQUIRED)

GAS WATER HEATER DETAIL

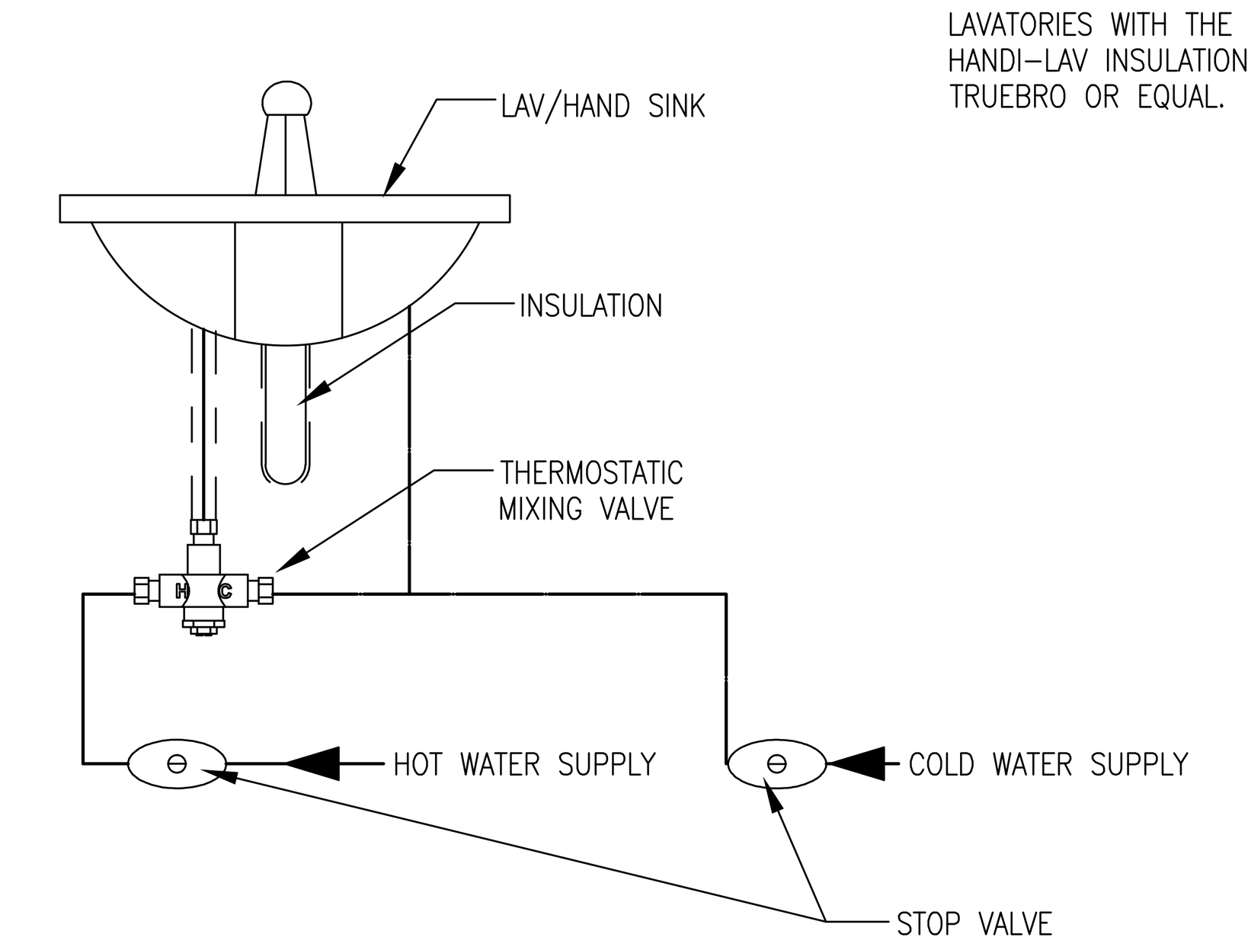
SCALE: NONE (7)



POINT OF USE WATER HEATER DETAIL

SCALE: NONE (8)

NOTE:
INSULATE ALL EXPOSED WASTE AND SUPPLY PIPING UNDER LAVATORIES WITH THE HANDI-LAV INSULATION KIT BY TRUEBRO OR EQUAL.



LAVATORY/ HAND SINK TEMPERING VALVE

SCALE: NONE (9)

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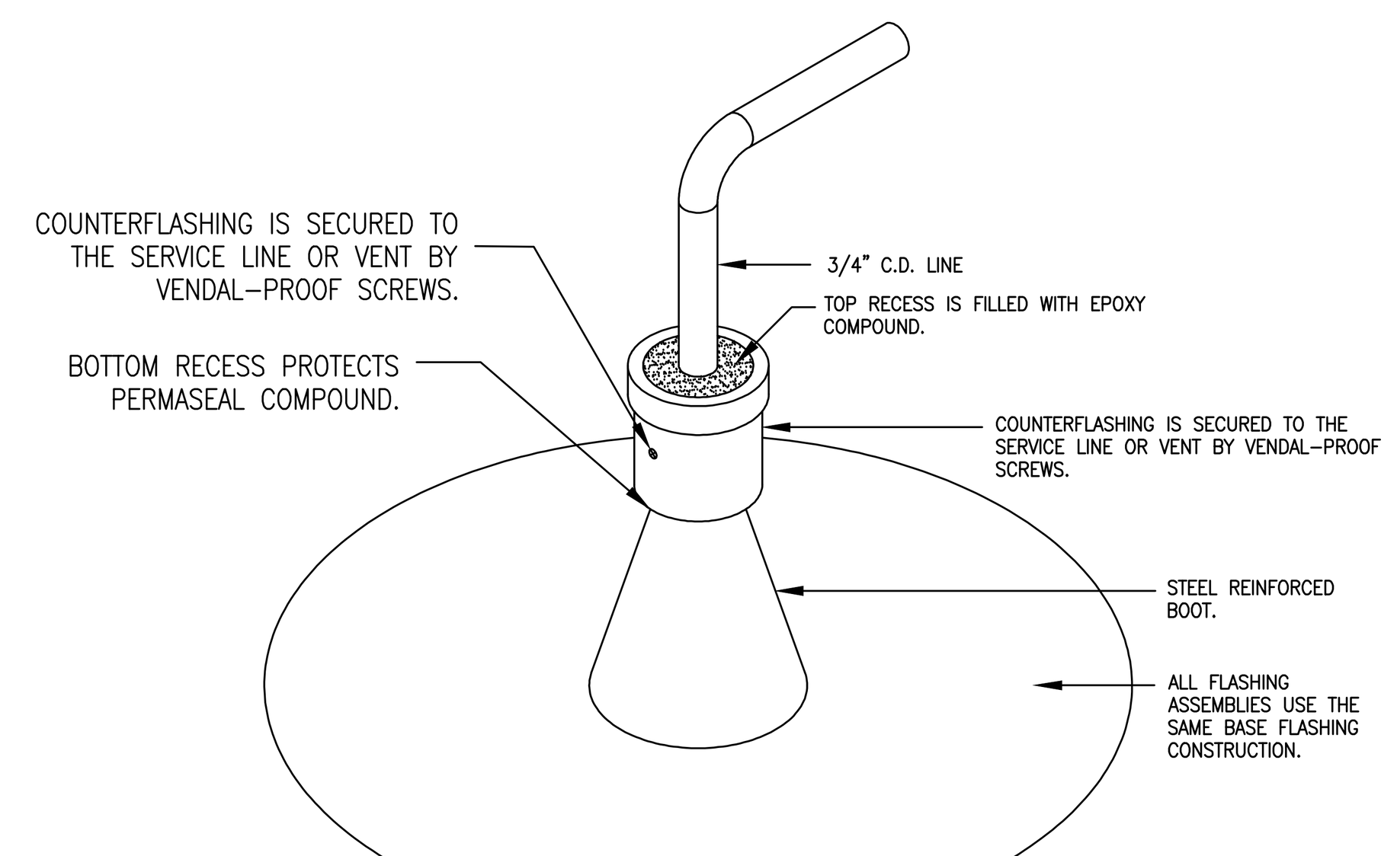
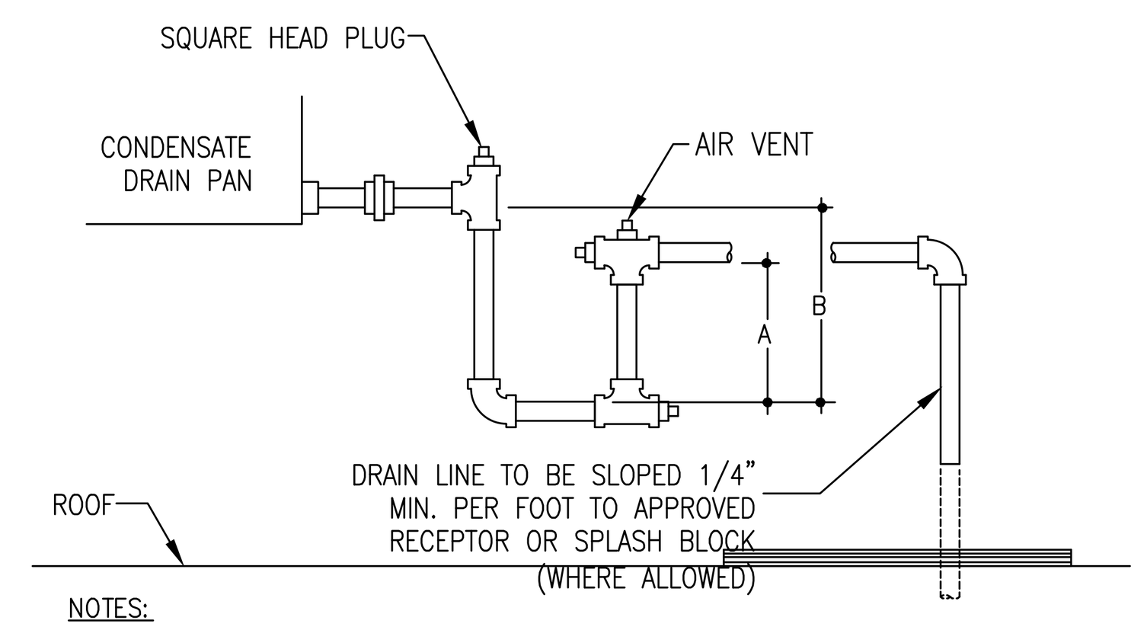


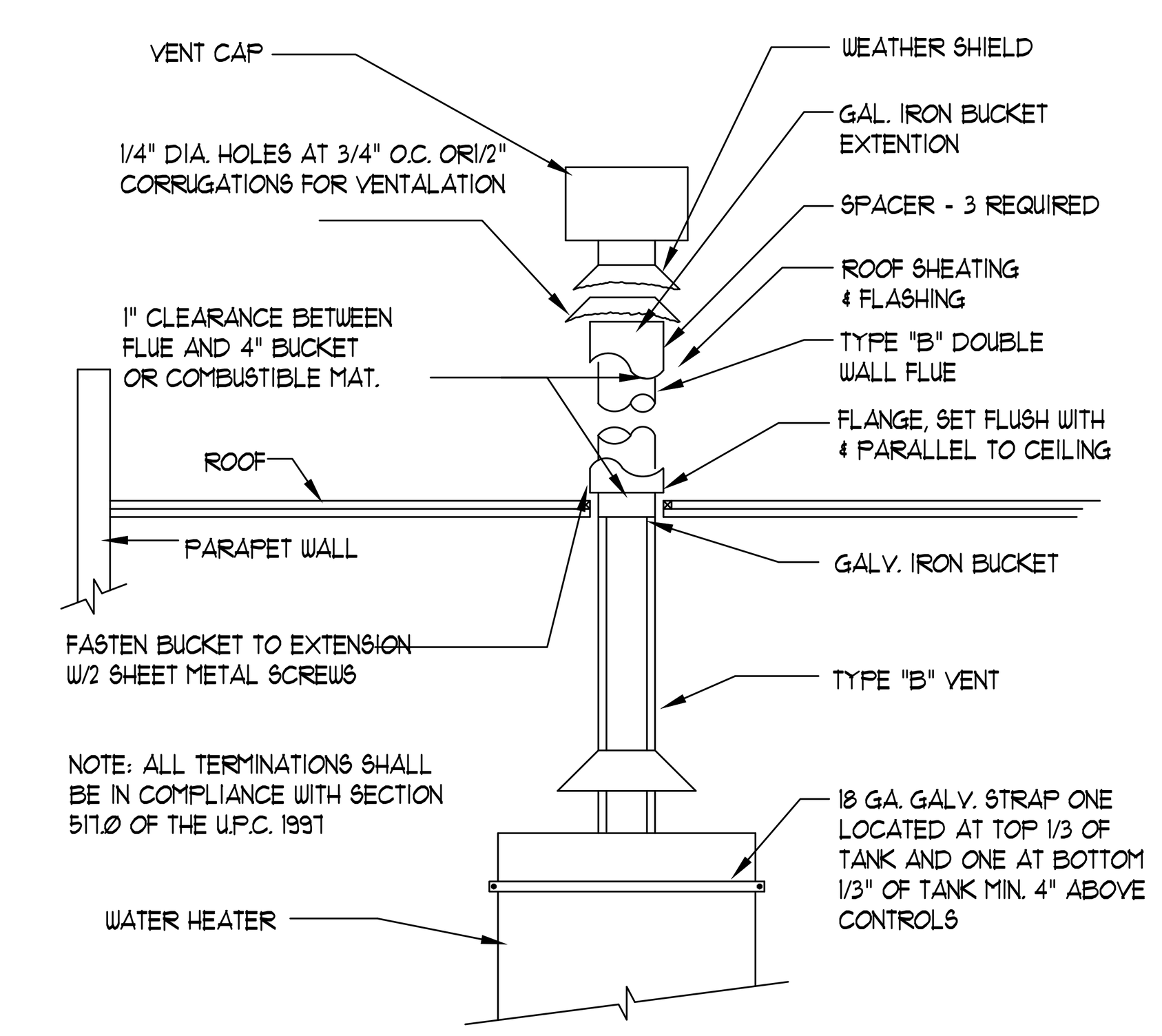
COUNTERFLASHING IS SECURED TO THE SERVICE LINE OR VENT BY VENDAL-PROOF SCREWS.
BOTTOM RECESS PROTECTS PERMASEAL COMPOUND.
3/4" C.D. LINE
TOP RECESS IS FILLED WITH EPOXY COMPOUND.
COUNTERFLASHING IS SECURED TO THE SERVICE LINE OR VENT BY VENDAL-PROOF SCREWS.
STEEL REINFORCED BOOT.
ALL FLASHING ASSEMBLIES USE THE SAME BASE FLASHING CONSTRUCTION.

CONDENSATE DRAIN ROOF PENETRATION DETAIL — SCALE: NONE (1)



NOTES:
1. FILL TRAP MANUALLY ON INITIAL START-UP.
2. TRAP EACH COMPONENT DRAIN CONNECTION.
3. A = NEG. S.P. = 2" B = (2 X NEG. S.P.) = 4"

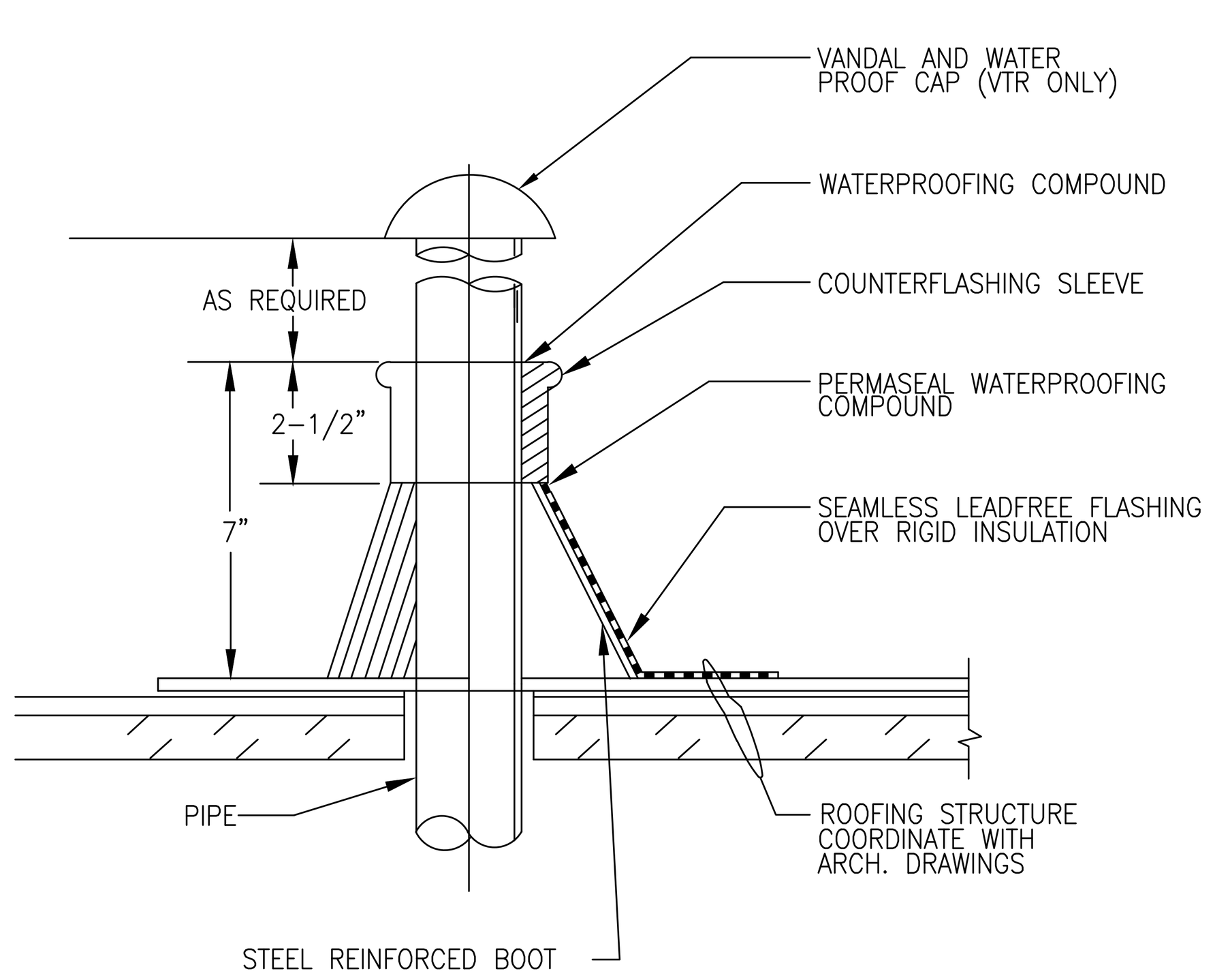
CONDENSATE "P" TRAP DETAIL — SCALE: NONE (2)



VENT CAP
1/4" DIA. HOLES AT 3/4" O.C. OR1/2" CORRUGATIONS FOR VENTALATION
1" CLEARANCE BETWEEN FLUE AND 4" BUCKET OR COMBUSTIBLE MAT.
ROOF
PARAPET WALL
FASTEN BUCKET TO EXTENSION W/2 SHEET METAL SCREWS
NOTE: ALL TERMINATIONS SHALL BE IN COMPLIANCE WITH SECTION 517.0 OF THE U.P.C. 1997
WATER HEATER
WEATHER SHIELD
GAL. IRON BUCKET EXTENTION
SPACER - 3 REQUIRED
ROOF SHEATING & FLASHING
TYPE "B" DOUBLE WALL FLUE
FLANGE, SET FLUSH WITH & PARALLEL TO CEILING
GALV. IRON BUCKET
TYPE "B" VENT
18 GA. GALV. STRAP ONE LOCATED AT TOP 1/3 OF TANK AND ONE AT BOTTOM 1/3" OF TANK MIN. 4" ABOVE CONTROLS

NOTES:
1. FLASHING VENT CAP & WEATHER SHIELD SHALL BE FIRMLY SECURED TO FLUE W/ 4 SHEET METAL SCREWS.
2. BUCKET EXTENTION SHALL EXTEND THRU ROOF.

FLUE THRU ROOF DETAIL — SCALE: NONE (3)



VANDAL AND WATER PROOF CAP (VTR ONLY)
WATERPROOFING COMPOUND
COUNTERFLASHING SLEEVE
PERMASEAL WATERPROOFING COMPOUND
SEAMLESS LEADFREE FLASHING OVER RIGID INSULATION
AS REQUIRED
2-1/2"
7"
PIPE
ROOFING STRUCTURE COORDINATE WITH ARCH. DRAWINGS
STEEL REINFORCED BOOT

VENT THRU ROOF/ PIPE THRU ROOF — SCALE: NONE (4)

COPPER PIPING:
1. PROVIDE TRANSVERSE BRACING AT 40'-0" ON CENTER MAXIMUM.
2. PROVIDE LONGITUDINAL BRACING AT 80'-0" ON CENTER MAXIMUM.
   A. BRACE ALL PIPE 1-1/4" AND LARGER LOCATED IN MECHANICAL EQUIPMENT ROOM, BOILER ROOM.
   B. BRACE ALL PIPE 2-1/2" AND LARGER IN ALL OTHER LOCATION.

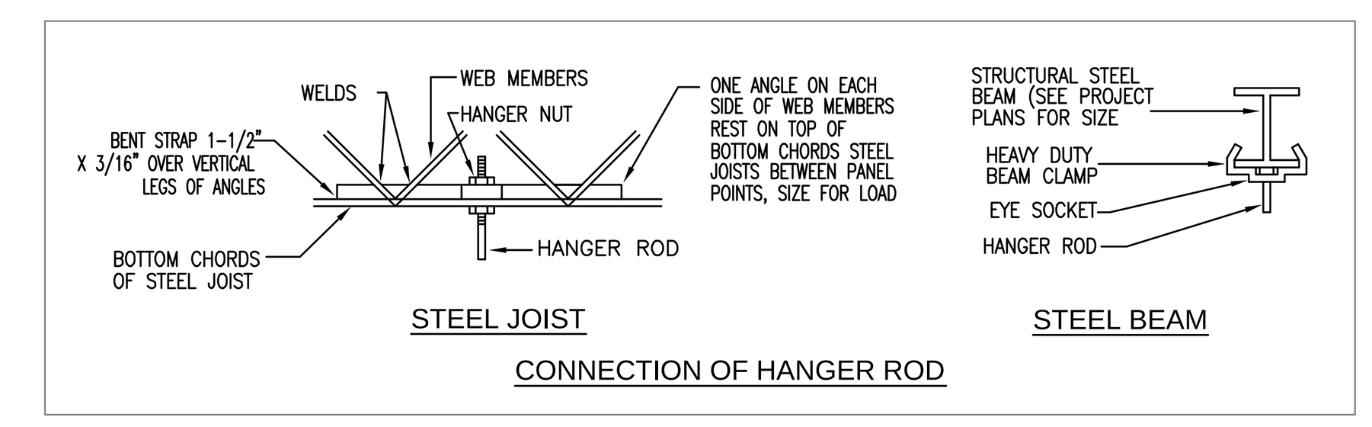
EXCEPTION:
SEISMIC BRACES MAY BE OMITTED WHEN THE TOP OF THE PIPE IS SUSPENDED 12" OR LESS FROM SUPPORTING STRUCTURE MEMBER AND THE PIPE IS SUSPENDED BY AN INDIVIDUAL HANGER.

STEEL PIPING:
1. PROVIDE TRANSVERSE BRACING AT 20'-0" ON CENTER MAXIMUM.
2. PROVIDE LONGITUDINAL BRACING AT 40'-0" ON CENTER MAXIMUM.
   A. BRACE ALL GAS PIPE 1" AND LARGER IN ALL LOCATION.

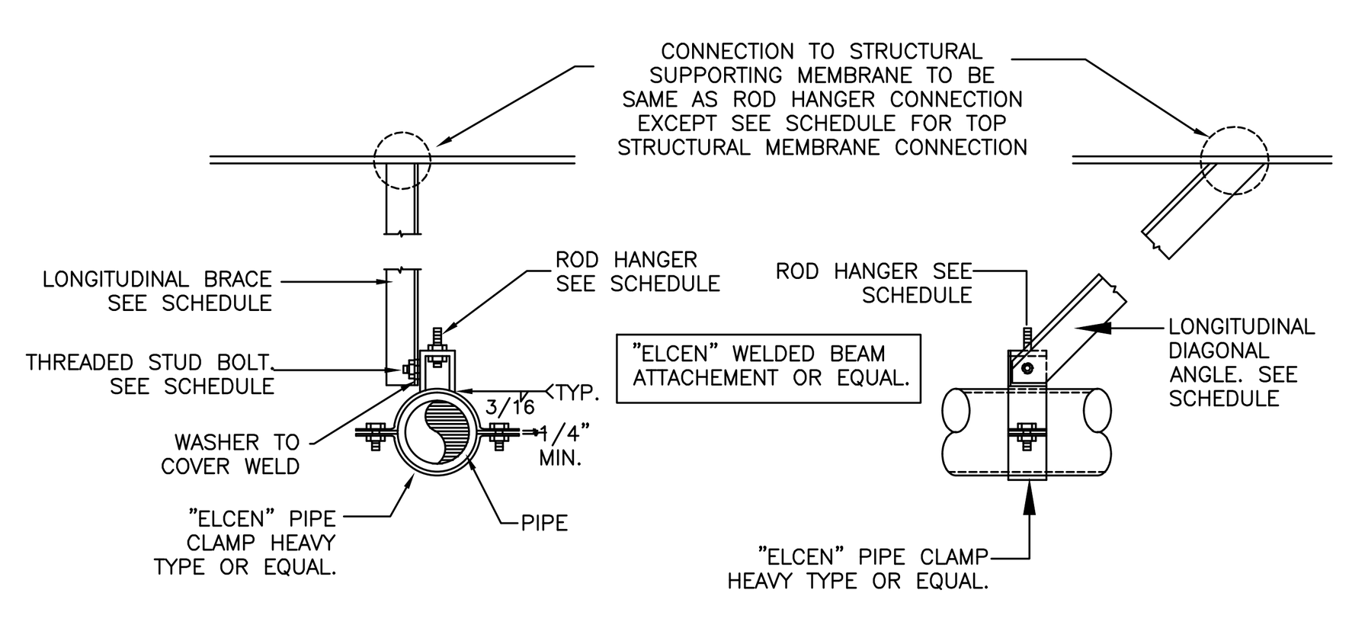
EXCEPTION:
SEISMIC BRACES MAY BE OMITTED WHEN THE TOP OF THE PIPE IS SUSPENDED 12" OR LESS FROM SUPPORTING STRUCTURE MEMBER AND THE PIPE IS SUSPENDED BY AN INDIVIDUAL HANGER.

HANGER ROD SCHEDULE

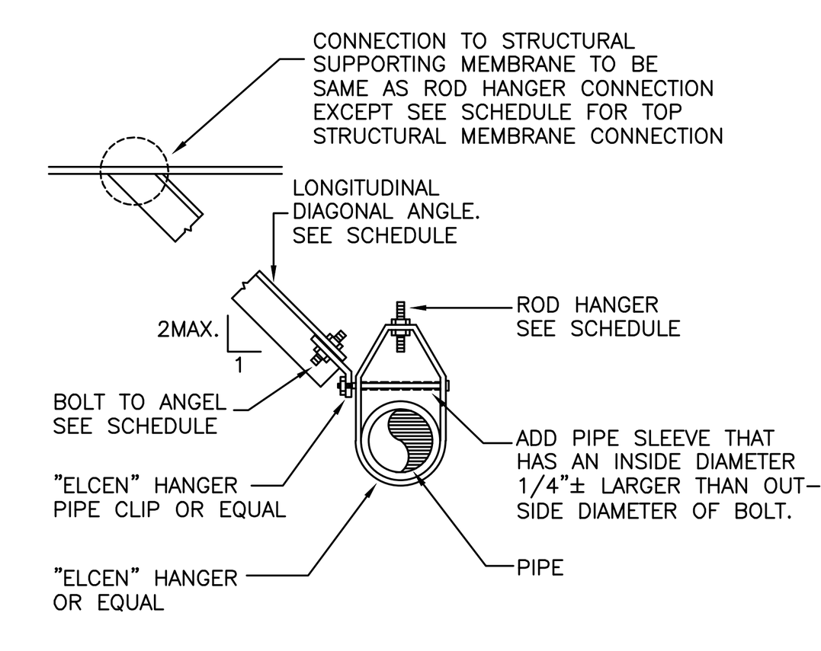
PIPE SIZE	HANGER TYPE	ROD SIZE	BOLTS TO ANGEL	DIAGONAL ANGEL	LONGITUDINAL DIAGONAL ANGEL	TOP CONNECTION OF DIAGONAL AND LONGITUDINAL ANGEL TO SUPPORTING STRUCTURE
UP TO 2"	CLEVIS TYPE	3/8"ø	3/8"ø	2"X2"X16 GAUGE	2-1/2"X2-1/2"X 16 GAUGE	L5"X3"X3/8"X3"LONG LEG HORIZONTAL
2-1/2" TO 3"	CLEVIS TYPE	1/2"ø	3/8"ø	2"X2"X16 GAUGE	2-1/2"X2-1/2"X 16 GAUGE	L5"X3"X3/8"X3"LONG LEG HORIZONTAL



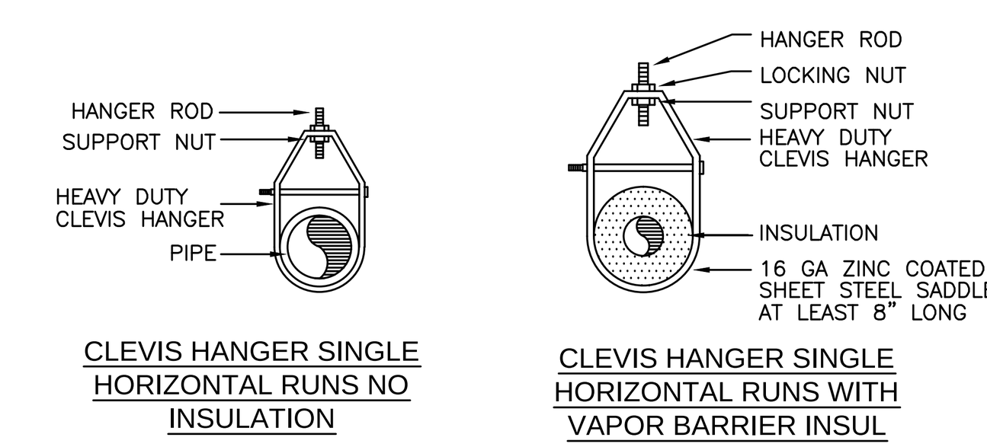
WELDS
WEB MEMBERS
HANGER NUT
BENT STRAP 1-1/2" X 3/16" OVER VERTICAL LEGS OF ANGLES
ONE ANGLE ON EACH SIDE OF WEB MEMBERS REST ON TOP OF BOTTOM CHORDS STEEL JOISTS BETWEEN PANEL POINTS, SIZE FOR LOAD
BOTTOM CHORDS OF STEEL JOIST
HANGER ROD
STRUCTURAL STEEL BEAM (SEE PROJECT PLANS FOR SIZE
HEAVY DUTY BEAM CLAMP
EYE SOCKET
HANGER ROD
STEEL JOIST
STEEL BEAM
CONNECTION OF HANGER ROD



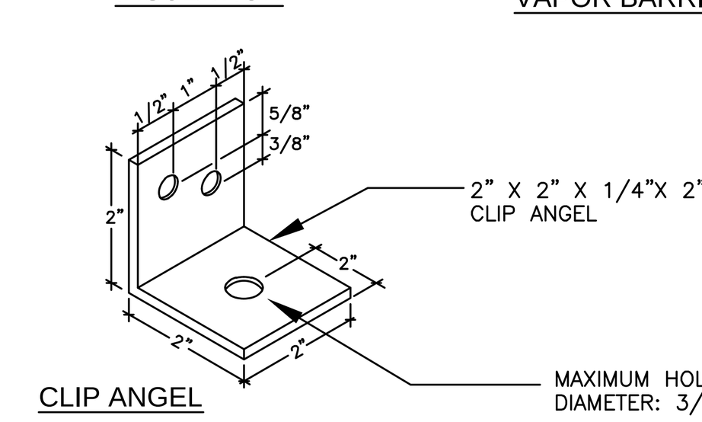
CONNECTION TO STRUCTURAL SUPPORTING MEMBRANE TO BE SAME AS ROD HANGER CONNECTION EXCEPT SEE SCHEDULE FOR TOP STRUCTURAL MEMBRANE CONNECTION
LONGITUDINAL BRACE SEE SCHEDULE
THREADED STUD BOLT SEE SCHEDULE
WASHER TO COVER WELD
"ELCEN" PIPE CLAMP HEAVY TYPE OR EQUAL.
ROD HANGER SEE SCHEDULE
3/16
TYP.
1/4" MIN.
PIPE
"ELCEN" WELDED BEAM ATTACHEMENT OR EQUAL.
ROD HANGER SEE SCHEDULE
LONGITUDINAL DIAGONAL ANGLE. SEE SCHEDULE
"ELCEN" PIPE CLAMP HEAVY TYPE OR EQUAL.
LONGITUDINAL PIPE BRACING



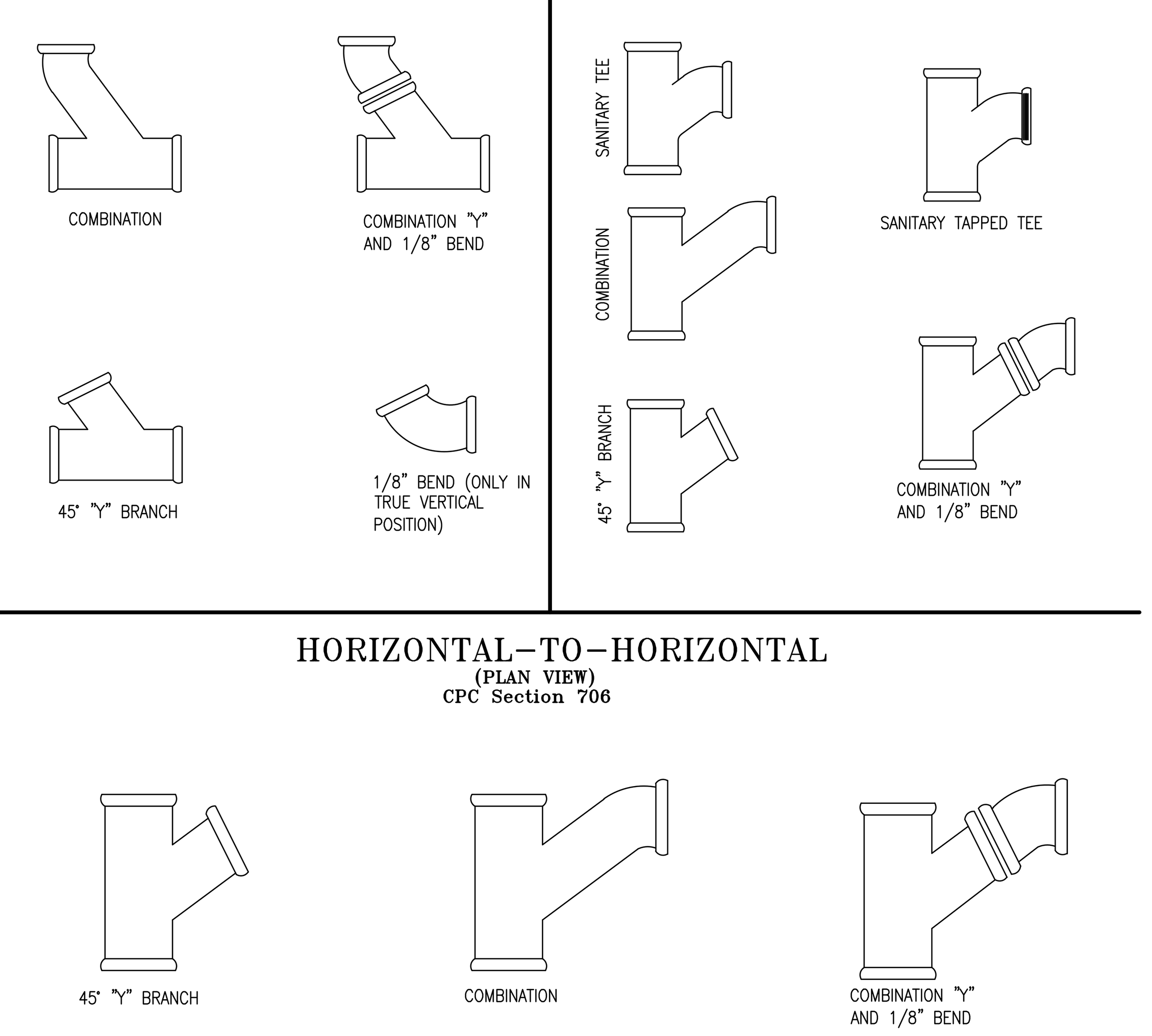
CONNECTION TO STRUCTURAL SUPPORTING MEMBRANE TO BE SAME AS ROD HANGER CONNECTION EXCEPT SEE SCHEDULE FOR TOP STRUCTURAL MEMBRANE CONNECTION
LONGITUDINAL DIAGONAL ANGLE. SEE SCHEDULE
2MAX.
1
BOLT TO ANGEL SEE SCHEDULE
"ELCEN" HANGER PIPE CLIP OR EQUAL
"ELCEN" HANGER OR EQUAL
ROD HANGER SEE SCHEDULE
ADD PIPE SLEEVE THAT HAS AN INSIDE DIAMETER 1/4"± LARGER THAN OUT-SIDE DIAMETER OF BOLT.
PIPE
TRANSVERSE PIPE BRACING



HANGER ROD
SUPPORT NUT
HEAVY DUTY CLEVIS HANGER
PIPE
CLEVIS HANGER SINGLE HORIZONTAL RUNS NO INSULATION
HANGER ROD
LOCKING NUT
SUPPORT NUT
HEAVY DUTY CLEVIS HANGER
INSULATION
16 GA ZINC COATED SHEET STEEL SADDLE AT LEAST 8" LONG
CLEVIS HANGER SINGLE HORIZONTAL RUNS WITH VAPOR BARRIER INSUL



PIPE SUPPORT DETAIL — SCALE: NONE (5)

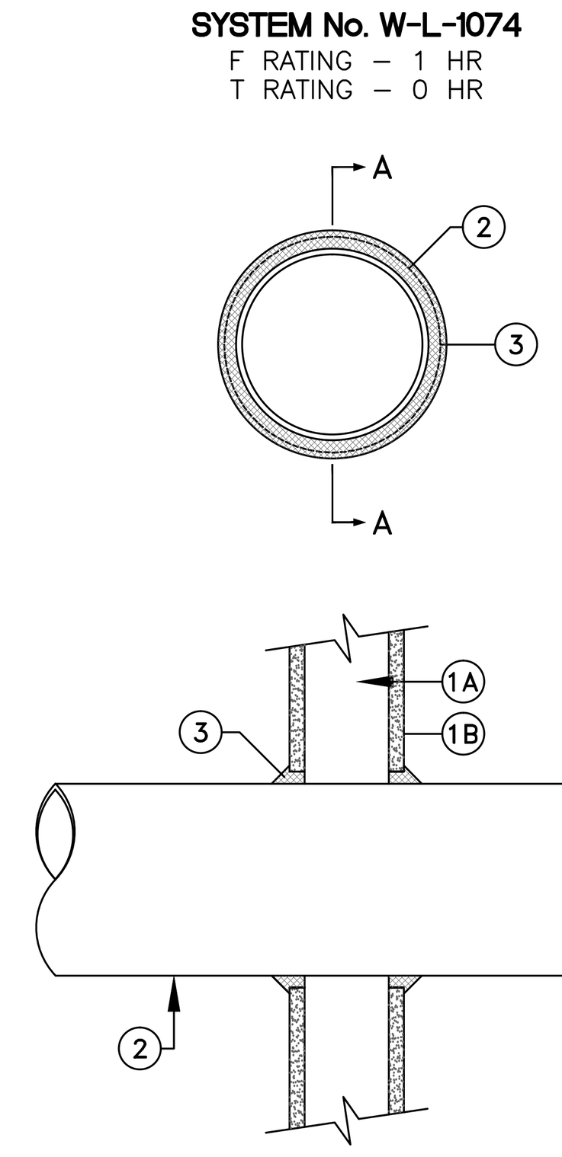


VERTICAL-TO-HORIZONTAL
CPC Section 706
COMBINATION
COMBINATION "Y" AND 1/8" BEND
45° "Y" BRANCH
1/8" BEND (ONLY IN TRUE VERTICAL POSITION)
HORIZONTAL-TO-VERTICAL
CPC Section 706
SANITARY TEE
SANITARY TAPPED TEE
COMBINATION
45° "Y" BRANCH
COMBINATION "Y" AND 1/8" BEND
HORIZONTAL-TO-HORIZONTAL
(PLAN VIEW)
CPC Section 706
45° "Y" BRANCH
COMBINATION
COMBINATION "Y" AND 1/8" BEND

ACCEPTABLE CHANGES IN DIRECTION OF DRAINAGE FLOW

PLUMBING FITTINGS — SCALE: NONE (6)

SYSTEM No. W-L-1074
F RATING - 1 HR
T RATING - 0 HR



SECTION A-A

1. WALL ASSEMBLY
THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS.
WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. O.C. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. O.C.

B. WALLBOARD, GYPSUM
ONE LAYER OF NOM 5/8 IN. THICK GYPSUM WALLBOARD AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 13-1/4 IN.

2. THROUGH PENETRANTS
ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE ANNULAR SPACE BETWEEN THE THROUGH-PENETRANT AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. TO MAX 1/4 IN. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS AND TUBING MAY BE USED:

A. STEEL PIPE
NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE
NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. CONDUIT
NOM 6 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
D. COPPER TUBING
NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. COPPER PIPE
NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. FILL, VOID OR CAVITY MATERIAL-CAULK
FILL MATERIAL TO BE FORCED INTO THE ANNULUS TO MAXIMUM EXTENT POSSIBLE. ADDITIONAL FILL MATERIAL TO BE INSTALLED SUCH THAT A MIN 1/2 IN. CROWN IS FORMED AROUND THE PENETRATING ITEM AND LAPPING 1/4 IN. BEYOND THE PERIPHERY OF THE OPENING.

FIRE RATED WALL PENETRATION DETAIL — SCALE: NONE (7)

SCALE: NONE (8)

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No. 26426
EXP. 9-30-19
MECHANICAL
STATE OF CALIFORNIA

SHEET TITLE:

PLUMBING DETAILS

SUB DATE

BID DATE

DATE: 05/08/2019
DRAWN BY: R.C./J.S.
JOB NO: 18-169
CHECKED BY: S.G

SHEET NUMBER:
P4.1

PLUMBING

The general conditions and general requirements sections shall apply directly to this section as though printed herein.

1. SCOPE

A. Work included all labor,materials,equipments and incidentals required to furnish and install all plumbing work as indicated on the plans, specified herein, and/or as necessary to complete the work including but not limited to the following

1. Sanitary soil, waste and vent system, Combination waste and vent system.
2. Domestic hot and cold water systems.
3. Condensate drain system.
4. Plumbing fixtures, equipment, trim.
5. Rough-in and final connections of water and drain not included in this Section or as to equipment, furnished by Owner.
6. Gas system.
7. Excavation and backfilling.
8. Testing.

2. EXAMINATION OF THE SITE

Examine the site and all conditions thereon or therein. Take into consideration all conditions that may affect the work under this Contract. Lack of this information will not be considered as justification for extra cost or allowances to the Contract sum.

3. CODES AND REGULATIONS

A. Ordinances and Regulations: In addition to complying with the specified requirements, comply with pertinent regulations of governmental agencies having jurisdiction.

B. Permits and Inspections: Apply and pay for all permits for the installation or construction of the plumbing work required by any legally constituted public authorities having jurisdiction and furnish all necessary drawings required for same. Arrange for inspections and examinations as required, and deliver certificates of all inspections to the Owner.

4. DRAWINGS AND SPECIFICATIONS

A. The Drawings are in part diagrammatic and are intended to convey the scope of the work; they indicate the general arrangement and approximate sizes of equipment, piping, etc. Follow the Drawings as closely as practical in laying out the work, be guided by the conditions at the job and consult the Construction Drawings of the other trades to become familiar with all conditions affecting the Work.

B. Verify all clearances in areas where Work will be installed and coordinate the Work with that of the other trades and other Sections of the Specifications.

C. Where job conditions, or the Architect require reasonable changes in indicated locations and arrangement, make such changes without additional charge.

D. It is the intent of the Drawings and Specifications to provide complete operating systems, unless specifically noted to the contrary. The omission from the Drawings or Specifications of any minor details of construction, installation, materials, or specialties necessary for a safely operable system shall not relieve the Contractor from furnishing the such items in place, complete.

5. SUBSTITUTIONS

A. Whenever a product is specified by trade name or manufacturer's name, either in the Specifications or on the Drawings, such designation is intended to establish a standard of merit and design.

B. Submit written requests for substitutions in triplicate. Include catalog numbers, capacities, ratings and the cuts of products specified as well as products to be substituted. Also include accurate cost data on the proposed substitution in comparison with the products specified and whether or not modification of the Contract amount is to be considered.

C. Substitutions of unlisted manufacturers will not be allowed after the Contract is signed.

6. SUBMITTALS

A. Product Data: Submit material list of items proposed to be provided under this Section. Include Manufacturers' specifications, catalog cuts, and other data needed to comply with the specified requirements. Submit all product data atone time, bound between covers. Partial submittals will not be accepted.

B. Shop Drawings or other data as required to indicate method of installation and attachment of piping, and equipment, except where such details are fully shown on the Drawings.

C. Record Drawings and Manuals: Provide and keep at job site a complete record set of blueline prints, corrected daily to show every change from the original Drawings and Specifications. Prints for this purpose may be obtained from the Architect. Deliver the set to the Architect. Pay for blueprinting Project Record Drawings.

7. OPENINGS

A. Openings or holes for piping or equipment will not be allowed in any structural members without consent of the Architect.

B. Framed openings have been indicated on the Architectural and Structural Drawings. At a time in advance of the work, verify the location and size of openings or furnish new instructions as to the requirements for these openings. Should the furnishing of this information be neglected, delayed or incorrect, and additional cutting, notching, or boring is found to be required, the work shall be done as directed by the Architect at no additional cost to the Owner.

c. make absolutely watertight any openings through waterproofed construction caused by the penetration of piping in a manner approved by the architect.

8. QUALITY ASSURANCE AND PRODUCT HANDLING

A. Use all means necessary to protect plumbing materials before, during and after installation and to protect the installed work and materials of all other trades.

B. In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the Architect and at no additional cost to the Owner.

9. NOISE AND VIBRATION

It is the specific intent of these Specifications and design conditions that the entire system including equipment, piping,and all other parts be noiseless and free of vibration transmission. Provide and install vibration dampers, sound insulation pads, flexible connectors and similar material as required, to prevent transmission to the building structure of sound and vibration caused by the flow of fluids, motors, and motor operated equipment. If, as a result of the installation, noise or vibrations occurs in the building, make the necessary corrections at no cost to the Owner. Do not reduce the capacity of any equipment.

10. WARRANTY

Be responsible for all work under this Section, adjust all valves, controls, vacuum breakers and other incidental items.Leave the system in perfect operating condition. Repair,regulate and replace any defective workmanship, materials, and equipment which may become apparent within one year after the date of the final acceptance of the Work, at no additional cost to the Owner. Furnish the Owner all manufacturer's written warranties of materials and equipment.

11. MATERIALS

Provide all new materials, in proper condition, of the best quality for the purpose intended, clearly marked or stamped with the manufacturer's name and/or stamp and rating.

A. Soil,waste and vent: Cast iron no hub pipe and fittings with stainless steel clamp.

B. Domestic Water(above ground): Type L hard drawn copper ASTM B88.and wrought copper fittings.

C. Domestic Water(below ground;%%uinside building%%U): Type K soft drawn copper.

D. Domestic Water(below ground;%%uoutside building, 3" and smaller%%U): type k hard drawn copper.

E. Domestic Water(below ground;%%uoutside building 4" and larger%%U): ductile iron class 51. conform to AWWA standard C-151. pipe and fittings shall be cement lined in accordance with AWWA standars C-104. fittings shall conform to AWWA standard C-110. 250 psi pressure rating, standard outside coating and cement mortar lining, joint shall conform to AWWA standard C-11, mechanical or push-on joints.

F. Indirect drain: Type L hard drawn copper tubing ASTM B.88 with wrought copper fittings.

G. Gas: 2-1/2" and smaller: Schedule 40 black steel pipe with 150 psi. black banded malleable iron screwed fittings. 3" and larger: Schedule 40 black steel pipe with 150 psi butt welded black malleable iron fittings.

11B.PIPE FITTINGS

1. Provide fittings for cast iron soil pipe of the same material, weight and quality specified for pipe.

2. Provide for black steel pipes 2-1/2" and smaller, banded, black malleable iron fittings.

3. Provide for copper water pipes, wrought copper solder joint fittings. Cast fittings will not be permitted.

4. Provide for exposed fixture connections, 85% cast red brass, polished and chromium plated fittings.

11C.UNIONS

Union shall be provided at all equipment, at points adjacent to all valves, and elswhere as required to permit servicing of fixtures. Unions to as manufactured by Crane or equal.

11D.VALVES

1. General: Non rising stem may be used only where there is insufficient clearance. Solder joint or screwed type valves shall be used in copper piping. Valves of one type shall be of the same manufacturer. NIBCO or approved equal
VALVES SCHEDULE
Gate valve: NIBCO NO. S-113
Globe valve: NIBCO S-211-Y
Check valve: NIBCO NO. S-413-Y
Ball valve: NIBCO NO. S-580 2.
Pressure and Temperature Relief Valve: McDonnel and Miller, Mueller, or Watts.
Gas cock: Nordstorm or equal.

11E.PIPE SUPPORTS

FEE MASON or approved equal

11F.SLEEVES

Provide Elcen "E-Z Crete" rust-proof sleeves of the size required.

11G.ACCESS PANELS & BOXES

Provide access panels as manufactured by J.R.Smith Elmdor or equal in quality and style . Provide access panels with the sme fire rating as the wall or ceiling in which they are installed.

1. PLASTER WALL AND CEILING: ELMDOR PW SERIES AKL HINGED PRIME COATED STEEL TRIMLESS ACCESS PANEL WITH PLASTER GROUND.

2. TILE, DRYWALL AND CEILING: ELMDOR PW SERIES AKL HINGED STAINLESS STEEL FLANGED ACCESS PANEL WITH BRIGHT FINISHE FOR TILE WALLS, PRIME COATED STEEL FOR PAINTED WALLS.

3. Acoustical tile: Elmdor AT Series AKL hinged prime coated steel flanged access panel.

4. Fire rated Wall and Ceiling: Elmdor FR Series AKL with recessed turn latch.

11H.FLASHING

Provide for each pipe passing through the roof 3 LBS. seam- less lead flashing assembly.flashing to have steel reinforced conical boot and counterflashed with hooded cast iron counter- flashing sheet lead turned down to the pipe and sealed to the pipe. Manufactured by stoneman or equal.

11I.PRESSURE GAUGES AND THERMOMETER

MARSH TRERICE or approved equal

11M.MOTORS AND ELECTRICAL APPARATUS

Provide motors of proper power and speed to suit specified makes of equipment, horsepower and electrical characteristics as indicated on the Drawings.

12.TRENCHING AND BACKFILLING

A. Do all necessary trench excavations, shoring and backfilling required for the proper laying of all underground piping. Make trenches at least 12 inches wider than the greatest diameter of the pipe. Should rock be encountered, excavate same to the depth of one foot below the bottom of the pipe, and fill the space with well tamped sand and pea gravel.

B. Lay pipe on a bed of sand at least two inches deep. Cover pipe with another two inches of sand.

13.MANUFACTURER'S RECOMMENDATIONS

Install all equipment, material, fixtures, and devices in accordance with the recommendations of the manufacturer and the requirements of the Drawings and Specifications. In the event of conflict, consult the Architect for a decision and perform the Work in accordance with his decision.

14.INSTALLATION OF PIPING

A. General:

1. Clean all pipe and remove all scale, sand, dirt, etc., before installation. Use full lengths of pipe whenever possible to minimize the number of couplings.

2. Cut pipes accurately to measurements established on the site. Work pipes into place without springing or forcing, and properly clear equipment, doors and openings of buildings.

3. Install all piping to run parallel to the building construction and arrange to form neat and symmetrical patterns to insure the best appearance possible.

4. Unless otherwise specified, conceal all pipe in walls , partitions or furred spaces.

5. Install piping at the exterior of the building, at a minimum depth of 18" below finish grade. Do not expose pipes on the exterior of building.

6. Use proper shoring and rigging methods.

7. Proceed with the rough piping as rapidly as the general construction work will permit and have all of the rough piping in and stubbed out to the proper point and tested,in each case, before any lath, plaster or finish work of the ceilings, partitions, walls, or floors are in place.

8. Install all pipes with allowances for expansion and contraction. Construct so that strains will be evenly distributed without damage to the system. Avoid building erection stresses into the piping.

9. Make connection between copper or brass piping and steel with approved dielectric couplings.

10.Avoid connections and equipment installation that could cause a cross connection between water supply and drainage.

11.Cover all exposed connections to plumbing fixtures with polished and chromium plated seamless copper casing.

12.Show no tool marks or threads on exposed plated, polished, or enameled connections from fixtures.

B. Soil, Waste, Vent and Drainage Piping:

1. Install piping as straight as possible and make all change in direction with fittings. Make offsets at 45 degrees or less.

2. Extend all vent pipes at least 6" above finished roofsurfaces and higher wherever required by local plumbing ordinances.

C. Water Piping:

1. Run level without pockets and as straight as possible.

2. Install hot and cold water lines at least 12" apart.

3. Isolate all water lines from all parts of the building structure and hangers with 1/2" thick waffle pattern, hair felt strips of a 2" minimum width completely surrounding the pipes. Use pipe isolators to isolate all pipe hangers and supports.

4. Install water hammer arrestors in an upright position on hot and cold water piping headers, at each quick closing valves and where indicated on the Drawings.

5. Install vacuum breaker on water lines where required by code even if not specifically mentioned in the Specification or indicated on the Drawings.

6. Arrange thermometers for easy reading from the floor and install all pressure gauges with shut-off cocks.

D. GAS PIPING:

1. RUN LEVEL WITHOUT POCKETS AND AS STRAIGHT AS POSSIBLE.

2. MAKE ALL CONNECTIONS TO GAS BURNING EQUIPMENT AND APPLIANCES USING STRAIGHT-WAY EVEN HANDLE SERVICE COCK BEFORE CONNECTION TO BURNER.

15.JOINTS

A. Screwed Steel Pipe: Cut threads with new clean dies. carefully - ream and inspect each piece of pipe before erection.Apply pipe dope to male threads only. Expose no more than two threads.

B. Copper Tubing: Cut pipe square, using proper tools and remove all burrs, thoroughly clean end of pipe equal to depth of fitting, using sand cloth, sandpaper or steel wool for cleaning purposes. Apply a coat of No. 50 Streamline paste to pipe and fittings. Liquid flux will not be permitted. Use 95-5 solder.install all piping in accordance with manufacturer's instruction.

C. Copper or Brass Pipe: Cut threads with new clean dies, full thicknesses of dies. Make joints with friction clamps and friction wrenches. Thoroughly ream each piece of pipe. Apply tape to male threads.

D. Welding Joints: Use qualified welders only. Make welds with electric arc using suitable coated rods. Properly bevel and clean all joints before welding. Weld in accordance with American Welding Society Standards and governing codes.

16.UNIONS

Install unions on connections to all equipment on the downstream side of all threaded or soldered valves and elsewhere as indicated on the Drawings.

17.VALVES

A. Install shut-off valves in all main services, at fixtures, and where required to provide complete isolation of all equipment,devices ,etc. for their proper servicing. Arrange valves to give complete and regulating control of piping systems throughout the building. Install all valves with best of workmanship, with neat appearance and grouping, so that all parts are easily accessible for maintenance.

B. Install trap primer with shut-off valve and union.

18.PIPE SUPPORTS

A. Support suspended piping with clevis or trapeze hangers and rods. In concrete slabs support piping from inserts or anchors. Where steel framing is used, attach supports with suitable clamps and to wood framing use suitable bolts or lag screws.

B. Support each item independently from other pipes. Do not use wire for hanging or strapping pipes.

C. Space hangers and supports for horizontal steel pipes according to the following schedule:

D. All piping which is not isolated from contact with the building by its insulation shall be installed with a manufactured type isolator.Horizontal piping in stud walls may be isolated with hair felt pads securely wired in place.

E. Isolator shall be Semco Trisolators. Series NO. 100 for I.P.S. piping and Series NO. 500 for copppertubing as manufactured by Stoneman Engineering and Mfg. Co. Pipe size:
Maximum spacing on center
1-1/4" and smaller---- 8'-0"
1-1/2" and larger---- 10'-0"
Other locations: Valves, fittings and change in direction.

F. Space hangers and supports for horizontal copper tubing according to the following schedule:
Tube size:
Maximum spacing on centers:
1-1/2" and smaller---- 6'-0"
2" and larger---- 8'-0"
Other locations: Valves, fittings and change in direction.

G. Provide sway bracing on hangers longer than 18".

H. Arrange pipe supports to prevent excessive deflection, and to avoid excessive bending stress.

I. Support vertical piping with riser clamps secured to the piping and resting on the building structure. Provide at each floor unless otherwise noted.

J. Support piping independently at pumps, tanks and similar locations, so that weight of pipe will not be supported by the equipment.

K. Hubless piping: Provide hangers on the piping at each side of, and within 6" of, hubless pipe coupling so the coupling will bear no weight. Maintain alignment and prevent sagging of pipe, and make adequate provision to prevent shearing and twisting of the pipe and the joint. Do not provide hangers on couplings. Horizontal spacing: 5'-0" Other locations: Fittings and change in direction.

L. Support piping on roof on 2" x 4" redwood blocks 12" long at maximum of 8'-0" O.C. Anchor piping to blocks.

M. Hanger rods shall comply with table 313.6 of the Uniform Plumbing Code:
pipe size 2" and smaller: 3/8 inch rod
pipe size 2-1/2" and 3": 1/2 inch rod
pipe size 4" and 5": 5/8 inch rod 19.

19.INSULATION

A. Insulate all domestic hot water supply and return piping. Do not cover unions.thickness shall be in accordance with table on P-1 (energy notes). material to be same as specified below in "B".

B. Insulate all condensate drain piping with 1/2" thick Armstrong 2000 or elastomeric or Imcoa polyolfin foam pipe insulation. All joints shall be sealed with Imcoa adhesive. all fittings to be insulated with miter cut pieces. Water pipes run in exterior wall chases are to be covered with 3/4" insulation. Fiberglass insulation is NOT allowed.

C. Provide insulation continuous through hangers and rollers.

D. Insulate the tail piece, "P" trap, trap arm and hot water supply piping at each fixture for handicapped use. Handi Lav-Guard Insulation Kits. manufactured by TRUEBRO INC.

20. PIPE WRAPPING

SPIRALLY WRAP ALL UNDERGROUND STEEL AND COPPER PIPING WITH PLASTIC TAPE ONE HALF LAPPED TO GIVE DOUBLE THICKNESS. WRAPALL FIELD JOINTS AFTER PRESSURE TEST. WHERE SOIL IS CORROSIVE ATTACH ANODES TO ALL UNDERGROUND STEEL PIPING WITH ISOLATION UNIONS IN ACCORDANCE WITH RECOMMENDATIONS OF A CORROSION ENGINEER.

A. For insulated pipe, provide sleeves of adequate size to accommodate the full thickness of pipe covering, with clearance for packing and calking.

B. Calk the space between sleeve and pipe or pipe covering, using a non combustible, permanently plastic, waterproof, non-staining compound which leaves a smooth finished appearance, or pack with non combustible insulating rope to within 1/2" of both wall faces, and provide the waterproof compound described above.

C. Finish and escutcheons:

1. Smooth up rough edges around sleeves with plaster or spackling compound.

2. Provide 1" wide chrome or nickel plated escutcheons held in place with set screw for all pipes exposed to view in finished spaces.

22.CLEANOUTS

A. Provide cleanouts of same nominal size as the pipes they serve, except where cleanouts are required in pipes 4" and larger provide 4" cleanouts.

B. Make cleanouts accessible. After pressure tests are made and approved, thoroughly graphite the cleanout threads.

23.TAGGING AND IDENTIFICATION

Label all valves with securely attached metal tags showing the service and valve number. Stamp tags with black filled numbers and letters. Prior to final inspection, submit to Architect two copies of chart showing valve number, service, valve location and area controlled.

24.TESTING

A. Test all work under the supervision of the representative of the Architect and/or Owner and inspected by all authorities having jurisdiction over this work. Deliver four (4) sets of all test charts and reports to the Architect.

B. Pressure Tests:

Test the various parts of the systems before piping is concealed as required by governing authorities and pay all costs for same.

1. Entire soil, waste and vent piping shall be tested with minimum of 10 feet head of water for three (3) hours.

2. All domestic water piping shall be tested under a hydrostatic pressure of 150 PSI for three (3) hours.

3. All gas piping shall be tested under air pressure of 50 PSI held for four (4) hours without any drop in pressure. check each joint and gas cock with soap sud.

C. Operating Tests:

1.Before final acceptance, perform operating tests for a duration of eight hours. Furnish all labor and instruments for tests.

D. Should the Contractor refuse or neglect to make any tests necessary to satisfy the Owner, or his representative, that he has carried out the true intent and meaning of the Specifications, the Owner may make such tests and charge the expense there of to the Contractor.

25.CLEANING

A. Thoroughly clean all equipment and piping to remove dust, scale, plaster, or any internal obstructions before any covering is installed or any piping, or equipment is painted and/or placed in operation. Clean exposed parts of equipment, remove oil and grease, and leave the bright metal parts clean and polished. Restore finished surfaces if damaged, and deliver entire installation in approved condition.

B. During the progress of the work, carefully clean up after your men, and leave the premises and all portions of the building in which you are working, free from debris. Upon completion of the work, remove all rubbish, debris and surplus materials resulting therefrom from the premises, and leave the site in and, clean and acceptable condition as approved by the Architect.

C. Before being placed in operation, flush clean inside of pipes, etc. Clean all strainers after operational tests. Clean plumbing fixtures of protective materials and clean and polished entire assemblies. Clean floor drain grates and check each fixture to insure against trap stoppage.

26.WATER SYSTEM STERILIZATION

Before the use of any portion of water system and before final acceptance of the system, the purity of the system must meet the requirements of the State Board of Health. Submit a Certificate from an approved testing laboratory that the water system meets all the purity requirements of the State Board of Health. Obtain written approval from water testing laboratory and submit to general contractor for approval.

27.GROUTING

Grout behind all wall-hung plumbing fixtures with hard, white durable plaster materials, eliminating all voids and cracks and providing sufficient plane-bearing surfaces for mounting.

28.ADJUSTING

Upon completion of and after cleaning of system and equipment, carefully adjust for normal operation the automatic parts of plumbing systems.

29.OPERATION AND MAINTENANCE INSTRUCTIONS

Upon completion of the work of this Section and before final acceptance, deliver to the Architect two copies of an operation and maintenance manual

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