

### NATURAL GAS PIPING

- BELOW GRADE PIPING AND FITTINGS (OUTSIDE):** PROVIDE SCHEDULE 40 BLACK STEEL, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND FORGED STEEL WELDING TYPE FITTINGS (ASTM A234) WITH (AWWA C105) POLYETHYLENE JACKET OR DOUBLE LAYER, HALF LAPPED 10 MIL POLYETHYLENE TAPE. PROVIDE WELDED JOINTS (ASME B31.9) FOR ALL UNDERGROUND PIPE. PROVIDE METALIZED WARNING TAPE BETWEEN GRADE AND ALL UNDERGROUND GAS PIPING.
- ABOVE GRADE PIPING AND FITTINGS:** PROVIDE SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2-1/2" AND LARGER.
- SPACE GAS PIPING HANGER RODS 7'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20"-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.
- PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
- GAS PRESSURE REGULATORS SHALL COMPLY WITH ANSI Z21.80. REGULATORS SHALL BE CAST IRON OR DIE-CAST ALUMINUM CONSTRUCTION WITH INTERCHANGEABLE ZINC-PLATED STEEL SPRINGS, ZINC-PLATED STEEL DIAPHRAGM PLATE, NITRILE RUBBER SEAT DISC, INTERCHANGEABLE ALUMINUM ORIFICE, AND ULTRAVIOLET-STABILIZED MINERAL FILLED NYLON SEAL PLUG. REGULATOR SHALL BE SINGLE-PORT SELF-CONTAINED WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF. OVERPRESSURE PROTECTION DEVICE SHALL BE FACTORY MOUNTED ON REGULATOR. WHEN USING VENTLESS REGULATORS, MOUNT REGULATOR IN A HORIZONTAL UPRIGHT POSITION. IF VENTED TYPE REGULATORS ARE USED, INSTALL VENT PIPING (FULL SIZE OPENING) FROM GAS PRESSURE REGULATORS TO OUTDOORS AND TERMINATE IN WEATHERPROOF HOOD.
- PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). LABEL ALL GAS PIPING ON 5'-0" CENTERS INDICATING THE GAS PRESSURE.  
5 PSI GAS PIPING SHALL BE LABELED "5-PSI GAS".  
2 PSI GAS PIPING SHALL BE LABELED "2-PSI GAS".  
LOW PRESSURE GAS PIPING SHALL BE LABELED "GAS"
- CONTACT LOCAL GAS UTILITY TO PROVIDE GAS SERVICE AND GAS METER WITH A PULSE OUTPUT COMPATIBLE WITH THE BUILDING AUTOMATION SYSTEM. COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR AND LOCAL GAS UTILITY.

### SANITARY WASTE & VENT PIPING

- BELOW GRADE PIPING AND JOINTS:** PROVIDE SERVICE WEIGHT CAST IRON HUB AND SPIGOT PIPE (ASTM A 74) WITH COMPRESSION JOINTS (CISPI H5N) AND NEOPRENE GASKETS (ASTM C 564) OR NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). INSTALL PLASTIC PIPE BELOW GRADE PER ASTM D2321. FOAM CORE PVC PIPING IS NOT APPROVED. NOTE: PROVIDE CAST IRON PIPING SPECIFIED ABOVE FOR ALL KITCHEN GREASE WASTE PIPING UPSTREAM OF THE GREASE INTERCEPTOR AND FOR MECHANICAL ROOM DRAIN PIPING, PVC IS NOT ACCEPTABLE IN THESE AREAS.
- ABOVE GRADE PIPING AND JOINTS:** PROVIDE SERVICE WEIGHT CAST IRON NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). FOAM CORE PIPE IS NOT APPROVED. DO NOT INSTALL PVC PIPING IN RETURN AIR PLENUMS.
- SLOPE WASTE PIPING AT 1/4" PER FOOT MINIMUM FOR PIPING 2-1/2" AND SMALLER AND 1/8" PER FOOT MINIMUM FOR PIPING 3" AND LARGER UNLESS NOTED OTHERWISE. SLOPE ALL KITCHEN GREASE WASTE PIPING AT 1/4" PER FOOT MINIMUM.
- PROVIDE CLEAN-OUTS AT THE BASE OF WASTE STACKS, AND AT EVERY TURN IN PIPING IN EXCESS OF 45° AND SPACED WITH-IN 100'-0" APART IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
- PROVIDE FLOOR CLEANOUTS WITH TOPS DESIGNED TO MATCH SPECIFIC FLOOR FINISHES SUCH AS CARPET, TILE, ETC. YARD CLEANOUTS SHALL BE PROVIDED IN AN 18"x18"x6" CONCRETE PAD.
- WHERE WASTE PIPING IS EXPOSED IN REST ROOM AREAS, PROVIDE CHROME PLATED BRASS PIPING, REMOVABLE P-TRAPS, MATCHING STOPS AND ESCUTCHEONS FOR ALL LAVATORIES.
- WASTE AND VENT SYSTEMS SHALL BE TESTED AND PROVED WATER TIGHT UNDER A HEAD PRESSURE OF NO LESS THAN 10 FT. THIS PRESSURE SHALL BE HELD FOR A PERIOD OF NO LESS THAN 15 MINUTES.
- WHERE MECHANICAL ROOM FLOOR DRAINS ARE INSTALLED ABOVE GRADE, PROVIDE 1" THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND JACKET ON THE FLOOR DRAIN BODY, THE ASSOCIATED P-TRAP AND HORIZONTAL DRAIN PIPING ABOVE GRADE.
- PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.

### DOMESTIC WATER PIPING

- BELOW GRADE PIPING AND JOINTS:** PROVIDE TYPE 'K' SOFT ANNEALED SEAMLESS COPPER TUBING (ASTM B 88) WITH NO JOINTS FOR PIPING 2-1/2" AND SMALLER. PROVIDE DUCTILE IRON PIPE AND FITTINGS (AWWA C151, AWWA C110) WITH RUBBER GASKET JOINTS AND RODS (AWWA C111) FOR PIPING 3" AND LARGER.
- ABOVE GRADE PIPING AND JOINTS:** PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32). JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS AS.8). ALTERNATELY PROVIDE COPPER PIPE AND FITTINGS AS SPECIFIED ABOVE EXCEPT WITH GROOVED ENDS (ASTM B 88, ASME B16.18) AND JOINTS UTILIZING GROOVED MECHANICAL COUPLINGS MEETING (ASTM F1476).  
- PROVIDE 1" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".  
- PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1-1/2" THRU 4".  
- PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".  
- PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".
- INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET. PIPE INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.27 BTUH x SQ. FT., SEE LIST BELOW FOR INSULATION THICKNESS:  
- PROVIDE 1" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".  
- PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1-1/2" THRU 4".  
- PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".  
- PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".
- PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD AND SHALL BE PLENUM RATED. PROVIDE PVC INSULATION JACKET FOR EXPOSED PIPING IN MECHANICAL ROOMS. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.
- PROVIDE A CHROME FINISH ON EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
- PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH DISSIMILAR OTHER METALS.
- PROTECT COPPER PIPING AGAINST CONTACT WITH MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND 15# ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.
- PERFORM A PRESSURE TEST ON ALL WATER PIPING. FILL PIPING WITH POTABLE WATER, CAP AND SUBJECT PIPING TO A STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS OR PRESSURIZE PIPING WITH AIR TO AT LEAST ONE-HUNDRED (100) PSI. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED
- STERILIZE THE DOMESTIC WATER SYSTEM IN PER THE AMERICAN WATER WORKS ASSOCIATION'S INSTRUCTION SPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
- SLOPE WATER PIPING FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.
- BALANCE THE DOMESTIC HOT WATER CIRCULATION SYSTEM TO THE PERFORMANCE SPECIFICATIONS INDICATED ON THE PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

### COMPRESSED AIR PIPING

- PROVIDE HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88), TYPE 'L' AND WROUGHT COPPER FITTINGS (ASME B16.22). JOINTS SHALL BE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32).
- PROVIDE SCHEDULE 40 BLACK STEEL (ASTM A53/A53M) WITH MALLEABLE IRON FITTINGS (ASME B16.3) OR FORGED STEEL WELDING TYPE (ASTM A234/A234M). JOINTS SHALL BE THREADED FOR 2" AND SMALLER, WELDED FOR 2-1/2" AND LARGER.

### PLUMBING GENERAL NOTES

- GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE PLUMBING SCOPE OF WORK. THE PLUMBING DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.
  - PLUMBING WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 NORTH CAROLINA STATE PLUMBING CODE AND WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
  - SCOPE: PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL PLUMBING SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES.
  - PERMITS: APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.
  - WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE TIME PERIOD SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.
  - COORDINATE ALL PLUMBING PIPING LOCATIONS, ROUGH-IN LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.
  - FIELD VERIFY PROPER OPERATION OF EXISTING SYSTEMS BEFORE STARTING CONSTRUCTION. NOTIFY THE ARCHITECT / ENGINEER OF RECORD OF ANY PROBLEMS OR DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS AND/OR ANY POTENTIAL PROBLEMS OBSERVED BEFORE CONTINUING WORK IN THE AFFECTED AREAS.
  - PLUMBING PLANS SHALL NOT BE SCALED. REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL LOCATIONS OF PLUMBING FIXTURES, FLOOR DRAINS, COLUMNS, WALLS, DOORS, ETC.
  - WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.
  - ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
  - ALL VALVES, BACKFLOW PREVENTERS, BOOSTER PUMPS, ETC. SERVING THE DOMESTIC WATER SYSTEM SHALL MEET LEAD FREE STANDARDS PER ANSI/NSF 372 AND NSF 61, ANNEX G.
  - PROVIDE COMPLETE PLUMBING FIXTURES AND EQUIPMENT. INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC. INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  - CUT WALLS, FLOORS AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. PATCH AND FINISH SURFACES TO MATCH ADJOINING SURFACES.
  - PIPING AND SPECIALTIES SHALL BE LOCATED CONCEALED IN WALLS, PARTITIONS OR ABOVE CEILINGS UNLESS NOTED OTHERWISE. PIPING IN EXPOSED AREAS SHALL BE RUN TIGHT TO UNDERSIDE OF STRUCTURE.
  - PIPE PENETRATIONS THRU WALLS, PARTITIONS AND FLOORS SHALL BE SLEEVED. CORE DRILLING THRU WALLS AND PARTITIONS IS PERMITTED IF PERFORMED IN A NEAT CRAFTSMAN LIKE MANNER. OPENINGS THRU WALLS, PARTITIONS, AND FLOORS SHALL BE LARGE ENOUGH FOR PIPE INSULATION TO REMAIN CONTINUOUS. PIPES PENETRATING THRU EXTERIOR WALLS SHALL BE SEALED WATER TIGHT. INSTALL ESCUTCHEONS IN ALL EXPOSED AREAS.
  - PROVIDE CONCEALED DOORS FOR ALL SPECIALTIES, VALVES, WATER HAMMER ARRESTORS, TRAP PRIMERS, ETC., CONCEALED BEHIND WALLS OR CEILINGS THAT REQUIRE MAINTENANCE ACCESS.
  - DO NOT INSTALL PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSTALL PIPING SHOWN IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.
  - PIPING, VENTS, ETC. EXTENDING THROUGH EXTERIOR WALLS AND/OR THE ROOF SHALL BE FLASHED AND COUNTER FLASHED IN A WATERPROOF MANNER. COORDINATE FLASHING WITH THE GENERAL CONTRACTOR.
  - PROVIDE A CHROME FINISH FOR ALL EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
  - PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
  - REFER TO THE STRUCTURAL PLANS AND DETAILS FOR ACCEPTABLE LOCATIONS TO ATTACH HANGERS AND SUPPORTS TO THE BUILDING STRUCTURE. HANGERS SHALL NOT ATTACH TO THE ROOF DECK.
  - PROVIDE MANUFACTURERS RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.
  - VALVES AND OTHER PIPING ACCESSORIES REQUIRING ACCESS SHALL BE INSTALLED IN ACCESSIBLE LOCATION NO MORE THAN 18" ABOVE THE CEILING, PROVIDE OFFSETS IN PIPING AS NEEDED.
  - PLUMBING SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: PLUMBING FIXTURES AND EQUIPMENT, FIRE STOPPING, SEISMIC BRACING, PIPE IDENTIFICATION, DOMESTIC WATER SYSTEM, SANITARY WASTE AND VENT SYSTEM, NATURAL GAS SYSTEM.
- FIRE STOPPING:**
- FIRE STOP ALL PENETRATIONS, BY PIPING OR CONDUITS, OF FIRE RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.
- SEISMIC BRACING:**
- PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE PLUMBING SYSTEM(S) IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE AND ASCE 7-10, CHAPTER 13. REFER TO THE APPENDIX B ON THE ARCHITECTURAL DRAWINGS FOR THE SITE'S SEISMIC DESIGN CATEGORY.
  - PROPERLY SUPPORT AND BRACE VERTICALLY AND HORIZONTALLY ALL PIPING, APPARATUS, EQUIPMENT, ETC. IN ACCORDANCE WITH APPLICABLE CODES TO PREVENT EXCESSIVE MOVEMENT DURING SEISMIC CONDITIONS.
- PIPE IDENTIFICATION:**
- PIPE IDENTIFICATION SHALL MATCH THE FACILITY'S EXISTING STANDARD. IF NO STANDARD EXISTS, THEN THE PIPE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI A13.1.
  - PROVIDE PIPING LABELS FOR ALL PLUMBING PIPING. PIPING LABELS SHALL BE ACRYLIC FACED, WRAP-AROUND TYPE. EACH LABEL SHALL INDICATE THE PIPING CONTENTS, DIRECTION OF FLOW AND SHALL BEAR THE MANUFACTURER'S STANDARD COLOR FOR THE SERVICE INDICATED.
- SUBMITTALS:**
- PROVIDE SUBMITTALS BEARING THE CONTRACTORS REVIEW STAMP FOR ALL PLUMBING FIXTURES, PIPING, EQUIPMENT AND ACCESSORIES IN ELECTRONIC FORMAT (PDF).
  - NO PRIVATE LABELED MATERIALS WILL BE ACCEPTED AS EQUALS TO PRODUCTS SPECIFIED HEREIN.
  - THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS TO ASSOCIATED MECHANICAL, ELECTRICAL OR PLUMBING SYSTEMS REQUIRED BY THE EQUIPMENTS INSTALLATION INSTRUCTIONS. ALL COSTS ASSOCIATED WITH SUBSTITUTIONS SHALL BE INCLUDED IN THE ORIGINAL BASE BID.

### PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
---	CW	COLD WATER PIPING
---	HW	HOT WATER PIPING
---	HWR	HOT WATER RETURN PIPING
--- CA ---	CA	COMPRESSED AIR PIPING
---	W	SANITARY WASTE PIPING
---	V	SANITARY VENT PIPING
--- GW ---	GW	GREASE WASTE PIPING
--- OW ---	OW	OIL WASTE PIPING
--- G ---	G	NATURAL GAS PIPING
---	-	PIPING ELBOW DOWN
---	-	PIPING ELBOW UP
---	-	PIPING CONTINUES
---	-	SHUT-OFF VALVE
---	-	CHECK VALVE
---	-	BALANCING VALVE
---	PRV	PRESSURE REDUCING VALVE
---	-	SOLENOID VALVE
---	RPZ	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
---	-	IN-LINE PUMP
---	-	PIPING REDUCER
---	FCO	FLOOR CLEANOUT
---	YCO	YARD CLEANOUT
---	WCO	WALL CLEANOUT
---	CO	PLUG CLEANOUT
---	FD	FLOOR DRAIN
---	FS	FLOOR SINK
---	HB	HOSE BIBB / WALL HYDRANT
---	SA-#	SHOCK ARRESTOR - SUFFIX INDICATES PDI SIZE

#### ADDITIONAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MFG	MANUFACTURER
AFG	ABOVE FINISHED GRADE	PSI	POUNDS PER SQUARE INCH
AVTR	ACID VENT THRU ROOF	T&P	TEMPERATURE AND PRESSURE
BAS	BUILDING AUTOMATION SYSTEM	TW	TEMPERED WATER
BFF	BELOW FINISHED FLOOR	TYP	TYPICAL
CFH	CUBIC FEET PER HOUR	UG	UNDERGROUND
CLG	CEILING	VTR	VENT THRU ROOF
CONT	CONTINUATION	WSV	WASTE STACK VENT
DN	DOWN	WC	WATER COLUMN
GPF	GALLONS PER FLUSH	EC	ELECTRICAL CONTRACTOR
GPM	GALLONS PER MINUTE	FSC	FOOD SERVICE CONTRACTOR
HP	HORSE POWER	GC	GENERAL CONTRACTOR
INV	INVERT ELEVATION	MC	MECHANICAL CONTRACTOR
KW	KILOWATT	PC	PLUMBING CONTRACTOR
MBH	1,000 BRITISH THERMAL UNIT / HOUR		

### PLUMBING SHEET INDEX

SHEET NUMBER	SHEET NAME
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P5.01	PLUMBING DETAILS
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P5.03	U.L. PENETRATION DETAILS



Project No.  
**1691**

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GORDON ROAD FIRE  
DEPARTMENT  
PLUMBING LEGEND, INDEX, AND NOTES

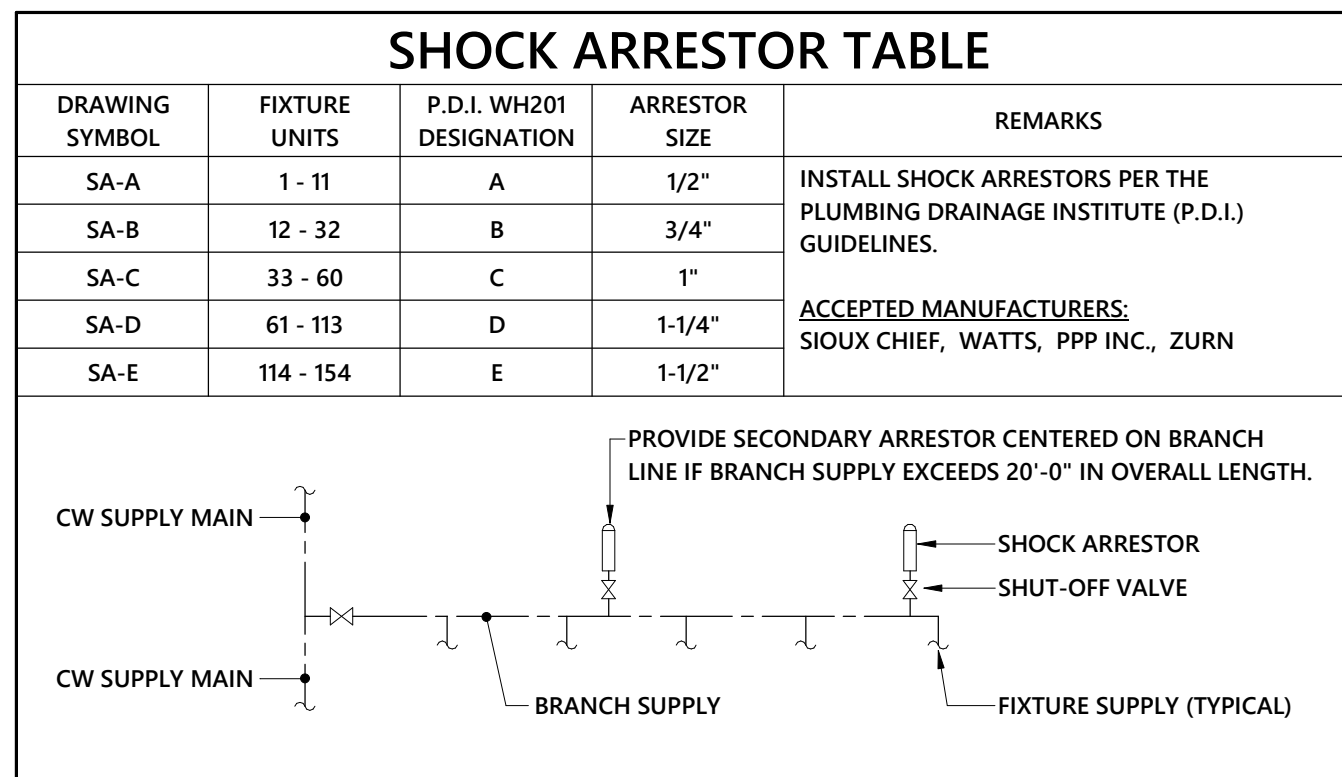
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**P0.01**

PLUMBING SPECIALTIES SCHEDULE							
SYMBOL	DESCRIPTION	CONNECTION SIZE				SPECIFICATION	REMARKS
		W	V	CW	HW		
WB1	WASHING MACHINE CONNECTION BOX; 14"x 9"x 3.5", 20 GAUGE STEEL WITH WHITE POWDER COATING, RECESSED IN WALL	3"	2"	1/2"	1/2"	FIXTURE: GUY GRAY T200TPPVCHA WITH WATER HAMMER ARRESTOR STOPS: INTEGRAL 1/4 TURN SUPPLIES: (2) 5/8" BRAIDED S.S. FLEXIBLE HOSES	2" DRAIN OUTLET, 2" STANDPIPE WITH 2" P-TRAP. SEE 9/P5.01
WB2	INDIRECT DRAIN CONNECTION BOX; 14"x 9"x 3.5", 20 GAUGE STEEL WITH WHITE POWDER COATING, RECESSED IN WALL	2"	1-1/2"	-	-	FIXTURE: GUY GRAY T200LV WITH KNOCK-OUTS IN TOP OF BOX 2" DRAIN OUTLET WITH 2" DEEP SEAL P-TRAP	PROVIDE 2" TRAP GUARD EQUAL TO RECTORSEAL "SURE-SEAL". SEE 9/P5.01
IMB1	WATER CONNECTION BOX; 7"x 7"x 3.5", 20 GAUGE STEEL WITH WHITE POWDER COATING, RECESSED IN WALL	-	-	1/2"	-	FIXTURE: GUY GRAY MIBIAB STOP: QUARTER TURN WITH SHOCK ARRESTOR SUPPLY: 1/4" FLEXIBLE HOSE	PROVIDE INLINE DOUBLE CHECK VALVE WILKINS SERIES 700
CS-x	BALANCING VALVE, THERMOSTATIC, AUTOMATIC, SUFFIX INDICATES PIPE SIZE, SEE FLOOR PLANS	-	-	-	**	EQUIPMENT: CIRCUIT SOLVER CS SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	PROVIDE 110°F MODEL
SA-x	SHOCK ARRESTOR, SUFFIX INDICATES PDI SIZE	-	-	x	-	EQUIPMENT: SIOUX CHIEF 650 SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	SEE SHOCK ARRESTOR TABLE THIS SHEET
HB1	HOSE BIBB, EXTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, FREEZELESS, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1310-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB2	HOSE BIBB, INTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1333-C-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB3	HOSE BIBB, INTERIOR, EXPOSED, AUTOMATIC DRAINING, ANTI-SIPHON, VACUUM BREAKER, HOT & COLD	-	-	3/4"	3/4"	EQUIPMENT: ZURN Z1327-EZ-VB, DUAL HANDLE, PROVIDE VACUUM BREAKER	MOUNT 18" AFF
WCO	WALL CLEANOUT, CAST IRON BODY, STAINLESS STEEL WALL PLATE	**	-	-	-	CLEANOUT: ZURN Z-1446-BP, BRONZE PLUG, CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT
FCO	FLOOR CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE	**	-	-	-	CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED FLOOR
YCO	YARD CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE, INSTALLED IN 18"x18"x6" CONCRETE PAD	**	-	-	-	CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG INSTALL IN 18"x 18"x 6" DEEP CONCRETE PAD	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED GRADE
HDCO	FLOOR CLEANOUT, HEAVY DUTY, CAST IRON BODY, ADJUSTABLE TOP	**	-	-	-	CLEANOUT: ZURN ZN1474-DC, BRONZE PLUG CLEANOUT SHALL MATCH PIPE SIZE	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED GRADE
FD1	FLOOR DRAIN (PUBLIC AREAS), CAST IRON BODY, ROUND NICKEL BRONZE GRATE, ADJUSTABLE	3"	2"	-	-	DRAIN: ZURN ZN-415-B, 6" DIAMETER GRATE P-TRAP: 3" DEEP SEAL.	INSTALL TOP FLUSH WITH FINISHED FLOOR. SEE NOTE 1 BELOW.
FD2	FLOOR DRAIN (MECHANICAL ROOMS), CAST IRON BODY, ROUND NICKEL BRONZE GRATE, ADJUSTABLE	3"	2"	-	-	DRAIN: ZURN ZN-415-I, 9" DIAMETER RECESSED GRATE P-TRAP: 3" CAST IRON, DEEP SEAL.	INSTALL TOP OF DRAIN LIP FLUSH WITH FLOOR. SEE NOTE 1 BELOW.
TD1	TRENCH DRAIN, GLASS REINFORCED POLYESTER (GRP) BODY, GALVANIZED STEEL EDGE RAIL, PROVIDE W/ T200-PGE-8-HP GRATE	3"	2"	-	-	DRAIN: MIFAB T2000-PB-13, 8" INTERNAL WIDTH, 39.4" LONG, INTERNALLY SLOPED P-TRAP: 3" CAST IRON, DEEP SEAL.	INSTALL TOP OF DRAIN LIP FLUSH WITH FLOOR. SEE NOTE 1 BELOW.
FS1	FLOOR SINK, 12"x 12"x 6" DEEP, STAINLESS STEEL BODY AND GRATE	3"	2"	-	-	DRAIN: ZURN Z1750 P-TRAP: 3" CAST IRON, DEEP SEAL.	

NOTES:  
 1. PROVIDE WATERLESS INLINE TRAP GUARD FOR EACH FLOOR DRAIN CONFORMING TO ASSE 1072 AND EQUAL TO RECOTORSEAL "SURE-SEAL" MODEL S53009V. INSTALL TRAP GUARDS IN THE OUTLET OF THE FLOOR DRAIN BODY (NOT IN THE STRAINER).

\*\* MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	SHOCK ARRESTOR HOSE BIBBS DRAINS BACKFLOW PREVENTER	SIOUX CHIEF, PPP INC., ZURN, WATTS ZURN, WOODFORD, ZURN, J.R. SMITH ZURN, J.R. SMITH, WADE WILKINS, WATTS, APOLLO



PLUMBING FIXTURE SCHEDULE							
SYMBOL	DESCRIPTION	CONNECTION SIZE				SPECIFICATION	REMARKS
		W	V	CW	HW		
P1	TOILET ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) HARD WIRED SENSOR OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: AMERICAN STANDARD 2234.001 "MADERA" FLUSH VALVE: SLOAN REGAL 111-1.28 DIAPHRAGM TYPE SEAT: BEMIS 1955CT ANTI-MICROBIAL (WHITE)	15" RIM HEIGHT. COORDINATE SENSOR JUNCTION BOX LOCATIONS WITH E.C. SEE NOTE 5 & 6 BELOW
PIA	TOILET, A.D.A. COMPLIANT ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) MANUAL OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: AMERICAN STANDARD 3043.001 "MADERA 16.5 HIGH" FLUSH VALVE: SLOAN REGAL 111-1.28 DIAPHRAGM TYPE SEAT: BEMIS 1955CT ANTI-MICROBIAL (WHITE)	16.5" RIM HEIGHT. COORDINATE SENSOR JUNCTION BOX LOCATIONS WITH E.C. SEE NOTE 5 & 6 BELOW
PIB	TOILET, A.D.A. COMPLIANT ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) HARD WIRED SENSOR OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: AMERICAN STANDARD 3043.001 "MADERA 16.5 HIGH" FLUSH VALVE: SLOAN 111-1.28 ESS TMO "OPTIMA" HARD WIRED SENSOR, WITH TRUE MECHANICAL OVERRIDE AND CHLORAMINE RESISTANT DIAPHRAGM SEAT: BEMIS 1955CT ANTI-MICROBIAL (WHITE)	16.5" RIM HEIGHT. COORDINATE SENSOR JUNCTION BOX LOCATIONS WITH E.C. SEE NOTE 5 & 6 BELOW
P3A	LAVATORY, A.D.A. COMPLIANT, 17"x14" OVAL BOWL, WHITE VITREOUS CHINA, UNGLAZED RIM, SINGLE CONTROL CENTER SET FAUCET, (0.5 GPM) VANDAL RESISTANT AERATOR, OPTIONAL DECK PLATE 2000.102P PER OWNER/ARCHITECT APPROVAL	2"	1-1/2"	1/2"	1/2"	FIXTURE: AMERICAN STANDARD OVALYNN MODEL 0496221.020 FAUCET: MOEN M-DURA MODEL 9419F12 GRID DRAIN: ZURN 8743; P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	SEE NOTES 2 & 4 BELOW
P3B	LAVATORY, A.D.A. COMPLIANT, 17"x14" OVAL BOWL, WHITE VITREOUS CHINA, UNGLAZED RIM, CENTER SET FAUCET, SENSOR OPERATED, BATTERY POWERED (PK00.WRK 10 YEAR BATTERY), WITH (0.5 GPM) VANDAL RESISTANT AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: AMERICAN STANDARD OVALYNN MODEL 0496221.020 FAUCET: MOEN M-POWER MODEL 8553AC GRID DRAIN: ZURN 8743; P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	SEE NOTES 2 & 4 BELOW
P4	BOTTLE FILLER, ADA COMPLIANT, STAINLESS STEEL FINISH, SINGLE BOTTLE, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF	2"	1-1/2"	1/2"	-	FIXTURE: ELKAY LZBWSSSMC, ELEC: 15 WATT, 115 VOLT, SINGLE PHASE P-TRAP: ZURN Z-870 (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	SEE NOTE 1 BELOW
P4A	WATER COOLER & BOTTLE FILLER, A.D.A. COMPLIANT, STAINLESS STEEL FINISH, BI-LEVEL DOUBLE BOWL, VANDAL RESISTANT, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: ELKAY LVRCGRNTLBSWK, ELEC: 260 WATT, 120 VOLT, SINGLE PHASE P-TRAP: ZURN Z-870 (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	PROVIDE CANE APRON WHEN WATER COOLER IS LOCATED ON AN EXPOSED WALL. SEE NOTE 3 BELOW
P5	MOP SINK, 24"x 24"x 10", MOLDED STONE, 12" STAINLESS STEEL WALL GUARDS, SERVICE FAUCET, HOSE, MOP HANGER BRACKET	3"	2"	1/2"	1/2"	FIXTURE: FIAT MSBID2424-100, 830AA, 832AA, (2) MSG3624, 889CC, E88A FAUCET: FIAT 830-AA DRAIN: FIAT 1453-BB P-TRAP: 3" DEEP SEAL, CAST IRON	PROVIDE CHECK VALVES ON HW AND CW SUPPLIES
P5A	SINK, A.D.A. COMPLIANT, 19"x19"x6" RECTANGULAR SINGLE BOWL, 18 GAUGE STAINLESS STEEL, COUNTER MOUNTED, SELF RIMMING, 8" GOOSENECK SENSOR FAUCET, 1 HOLE DRILLING, (1.5 GPM) VANDAL RESISTANT AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY LRAD1919 FAUCET: MOEN RILEY MODEL 7402EW BASKET STRAINER: ZURN Z-8740 P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	SEE NOTE 4 BELOW
P5B	SINK, DOUBLE COMPARTMENT, 33"x22"x12-1/8", RECTANGULAR, DOUBLE BOWL, 18 GAUGE STAINLESS STEEL, COUNTERTOP, SENSOR FAUCET, 1.5 GPM, 1 HOLE DRILLING, BASKET STRAINER, GARBAGE DISPOSAL	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY DLR332212 FAUCET: MOEN RILEY MODEL 7402EW BASKET STRAINER: ZURN Z-8740 P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK DISPOSAL: ISE BADGER 900, 3/4 HP, W/ POWER CORD	PROVIDE WATER AND WASTE CONNECTIONS FOR ADJACENT DISHWASHER SEE NOTE 4 BELOW
P5C	SINK, SINGLE, FLOOR MOUNTED, UTILITY 23"x21-1/2"x33-1/2", RECTANGULAR, SINGLE BOWL, DUAL HANDLE FAUCET	2"	1-1/2"	1/2"	1/2"	FIXTURE: FIAT FL-1 FAUCET: FIAT A1, 4" CENTERSET WITH CP BLADE HANDLES P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	
P5D	SINK, SCULLERY, FLOOR MOUNTED, DOUBLE BOWL WITH 24" DRAINBOARDS, 84-1/4" x 27-1/2", STAINLESS STEEL, DUAL HANDLE FAUCET	2"	1-1/2"	1/2"	1/2"	FIXTURE: EAGLE GROUP 412-16-2-24 FAUCET: T&S BRASS B-0230-187W5C4, 8" CENTERS, GOOSENECK STYLE BASKET STRAINER: ZURN Z-8740 SUPPLY/STOP: ZURN 8806-XL-LR-LK	INDIRECTLY DRAIN TO FLOOR SINK, PROVIDE CONNECTION TO PTA
P5E	SINK, SCULLERY, FLOOR MOUNTED, SINGLE BOWL, NO DRAINBOARDS, 21" x 25-13/16" x 43-3/4", STAINLESS STEEL, DUAL HANDLE FAUCET WITH HANDHELD SPRAY	2"	1-1/2"	1/2"	1/2"	FIXTURE: EAGLE GROUP 412-16-1 FAUCET: T&S BRASS B-0230-187W5C4, 8" CENTERS, GOOSENECK STYLE BASKET STRAINER: ZURN Z-8740 SUPPLY/STOP: ZURN 8806-XL-LR-LK	INDIRECTLY DRAIN TO FLOOR SINK
P6A	SHOWER, JOB-BUILT, ADA COMPLIANT, PUBLIC, FLOOR DRAIN, PRESSURE BALANCED SHOWER VALVE, 1.5 GPM WALL MOUNTED SHOWER HEAD WITH HAND HELD SHOWER AND SLIDE BAR	2"	1-1/2"	1/2"	1/2"	FIXTURE: AQUATIC MODEL 16037BFS-D-WH SHOWER VALVE & HEAD: MOEN MODEL T9342EP15 PROVIDE W/ MODEL 3360 VALVE DRAIN: SCHULTER KERDI MODEL KD2, CHROME FINISH P-TRAP: 2" DEEP SEAL TRAP	COORDINATE RIGHT OR LEFT HAND CONTROLS WITH ARCHITECTURAL PLANS AND ELEVATIONS. MOUNT SHOWER HEAD AT 7'-4" A.F.F.
P6B	SHOWER, JOB-BUILT, ADA COMPLIANT, PUBLIC, FLOOR DRAIN, PRESSURE BALANCED SHOWER VALVE, 1.5 GPM WALL MOUNTED SHOWER HEAD WITH HAND HELD SHOWER AND SLIDE BAR	2"	1-1/2"	1/2"	1/2"	FIXTURE: AQUATIC MODEL 13638FC2P-WH SHOWER VALVE & HEAD: MOEN MODEL T9342EP15 PROVIDE W/ MODEL 3360 VALVE DRAIN: SCHULTER KERDI MODEL KD2, CHROME FINISH P-TRAP: 2" DEEP SEAL TRAP	COORDINATE RIGHT OR LEFT HAND CONTROLS WITH ARCHITECTURAL PLANS AND ELEVATIONS. MOUNT SHOWER HEAD AT 7'-4" A.F.F.
P7A	EMERGENCY EYEWASH, WALL MOUNTED EYEWASH, SWING DOWN STYLE, STAINLESS STEEL FINISH, WITH FLIP TOP DUST COVER	-	-	1/2"	1/2"	EYEWASH: GUARDIAN G18-48 THERMOSTATIC MIXING VALVE: GUARDIAN G6020	PROVIDE WITH ANSI COMPLIANT SIGNAGE. AT SINK IN DECON ROOM

- NOTES:  
 1. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1222-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.  
 2. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED, ADJUSTABLE CONCEALED ARM CARRIER EQUAL TO ZURN Z1231-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND BLOCK WALL, PROVIDE EXTENDED CONCEALED ARM SLEEVES TO COMPENSATE FOR THE BLOCK WALL THICKNESS.  
 3. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1225-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.  
 4. PROVIDE PRE-MANUFACTURED A.D.A. COMPLIANT INSULATION KIT FOR EXPOSED P-TRAP AND SUPPLY TRIM UNDER SINK.  
 5. PROVIDE HEAVY DUTY CAST IRON CLOSET FLANGE WITH COMPRESSION SEAL AND TEST CAP EQUAL TO ZURN CF2980-C14. OFFSET FLANGES ARE NOT ACCEPTABLE.  
 6. PROVIDE SLOAN EL-154 TRANSFORMER (120V TO 24V) AND FINAL LOW VOLTAGE CONNECTIONS FROM TRANSFORMER TO FLUSHVALVE(S). WHERE GROUP RESTROOMS OCCUR PROVIDE A MINIMUM OF TWO TRANSFORMERS PER RESTROOM TO SERVE MULTIPLE FLUSHVALVES.

\*\* MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	VITREOUS CHINA FLUSH VALVES ENAMELED CAST IRON CARRIERS STAINLESS STEEL SINKS FAUCETS WATER COOLERS SUPPLIES, STOPS HOSE BIBBS UTILITY SINKS SHOWER VALVES	KOHLER, AMERICAN STANDARD, SLOAN SLOAN, ZURN, DELANEY KOHLER, AMERICAN STANDARD, ZURN ZURN, J.R. SMITH, WADE ELKAY, JUST, ADVANCE TABCO MOEN ELKAY, HAWS, MURDOCK ZURN, MCGUIRE, BRASSCRAFT ZURN, J.R. SMITH, WOODFORD FIAT, FLORESTONE, STERN WILLIAMS MOEN

Project No.  
**1691**

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PLUMBING ENGINEER  
JAMES A. WATTS  
No. 10000

03/28/2024

GORDON ROAD FIRE  
DEPARTMENT

PLUMBING SCHEDULES

Sheet No.  
**P0.02**

### GREASE INTERCEPTOR - GI1

SCHIER GREASE INTERCEPTOR GB-50 OR APPROVED EQUAL BY ZURN OR XERXES, 50 GPM FLOW, 60 GALLON GREASE CAPACITY, 3" INLET AND OUTLET, 2" VENTS, PROVIDE MANWAY TO MEET INVERT DEPTH AND STANDARD PEDESTRIAN-RATED MANHOLE COVER INSTALLED FLUSH WITH FINISHED FLOOR. REFER TO SCHEMATIC 5/P5.02.

### OIL INTERCEPTOR - OI1

STRIEM OIL TANKER MODEL OT-500-SS. MAX FLOW RATE: 314 GPM, 562 GALLON LIQUID CAPACITY, 285 GALLON OIL CAPACITY, 162 SOLIDS CAPACITY, HIGH DENSITY CONSTRUCTION, 4" INLETS AND OUTLETS AND 3" VENTS. PROVIDE MANWAY TO MEET INVERT DEPTH AND H-20 TRAFFIC RATED MANHOLE COVERS AND FRAMES INSTALLED FLUSH WITH FINISHED GRADE. PROVIDE REINFORCED CONCRETE RELIEVING SLAB WHEN INTERCEPTOR IS LOCATED IN AREAS WITH VEHICLE ACCESS. INSTALL PER THE MANUFACTURERS INSTRUCTIONS. COORDINATE EXACT LOCATION WITH SITE UTILITY CONTRACTOR. SEE MANUFACTURERS INSTALLATION INSTRUCTIONS FOR ADDITIONAL INFORMATION. REFER TO SCHEMATIC 4/P5.02.

### LINT INTERCEPTOR - LI-1

STRIEM TUFF TROUGH MODEL TT-3, 21 GALLON CAPACITY, 3/4" POLYETHYLENE CONSTRUCTION, 3'(L)x18"(W)x12"(H) WITH INTERNALLY SLOPED FLOOR AT 1/8" PER FOOT. PREINSTALLED COVER WITH MAXIMUM 450 LBS. LOAD CAPACITY WITH REMOVABLE PRIMARY AND SECONDARY FILTER SCREENS WITH 0.500" PERFORATIONS. PROVIDE WITH PLAIN END OUTLET AND 4" FIELD INSTALLED INLET. REFER TO SCHEMATIC 11/P5.01.

### GAS LOAD SUMMARY

EQUIPMENT	CONSUMPTION (CFH)
WATER HEATER: <u>WH1</u>	200
WATER HEATER: <u>WH2</u>	200
INFRARED HEATER: IH-1, IH-2 @ 60 CFH EACH	120
INFRARED HEATER: IH-3	20
OUTDOOR GRILL	100
<b>TOTAL</b>	<b>640</b>

NOTES:  
 FARTHEST POINT OF DELIVERY FROM GAS METER (TO 2 PSI GAS PRESSURE REGULATOR AT FARTHEST GAS-FIRED FIXTURE) = ±250 FT.  
 FUEL GAS CODE TABLE FOR ABOVE GRADE 2 PSI PIPING: 2018 NCFGC - TABLE 402.4(5) SCHEDULE 40 METALLIC PIPE, 2 PSI INLET PRESSURE, 1 PSI PRESSURE DROP.  
 FUEL GAS CODE TABLE FOR ABOVE GRADE LOW PRESSURE PIPING: 2018 NCFGC - TABLE 402.4(4) SCHEDULE 40 METALLIC PIPE, 0.5 PSI INLET PRESSURE, 0.5" W.C. PRESSURE DROP.  
 \*AVAILABLE AT PRESSURE REGULATOR

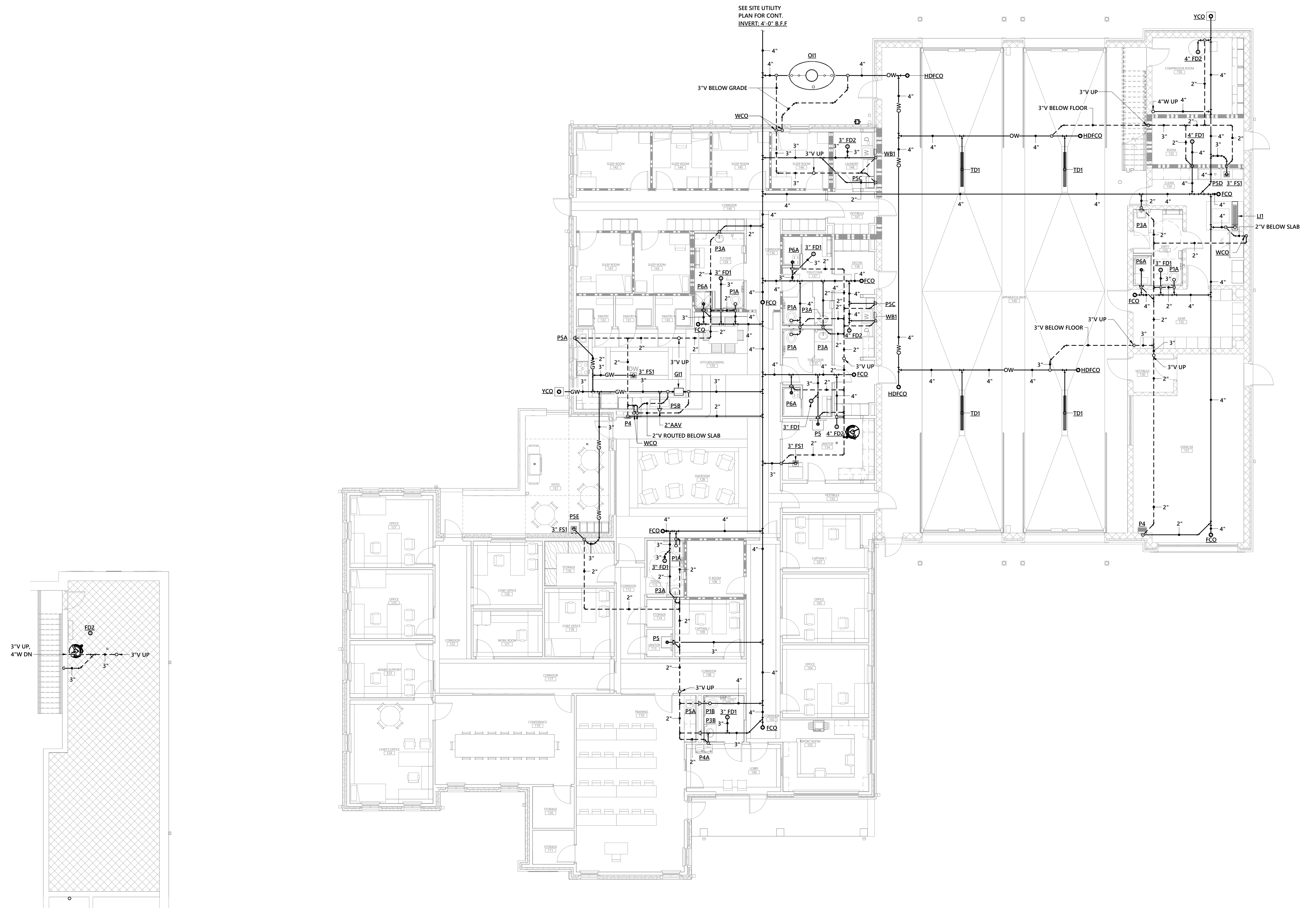
### PLUMBING EQUIPMENT SCHEDULE

SYM.	DESCRIPTION	CONN. SIZE		SPECIFICATION	REMARKS
		INLET	OUT		
WH1	WATER HEATER, COMMERCIAL, GAS-FIRED, 100 GALLONS, DIRECT-VENT	1-1/2"	1-1/2"	EQUIPMENT: A.O. SMITH BTH-199 GAS INPUT: 199,000 BTUH ELEC: 120V, 15A BREAKER RECOVERY: 235 GPH AT 100" RISE	SET OUTLET TEMP TO 140°F SEE NOTES 1 - 4 SEE 7/P5.02
WH2	WATER HEATER, COMMERCIAL, GAS-FIRED, 100 GALLONS, DIRECT-VENT	1-1/2"	1-1/2"	EQUIPMENT: A.O. SMITH BTH-199 GAS INPUT: 199,000 BTUH ELEC: 120V, 15A BREAKER RECOVERY: 235 GPH AT 100" RISE	SET OUTLET TEMP TO 140°F SEE NOTES 1 - 4 SEE 7/P5.02
ET1	THERMAL EXPANSION TANK 6.4 GALLON CAPACITY	3/4"	-	EQUIPMENT: AMTROL ST-12	SEE NOTE 5
ET2	THERMAL EXPANSION TANK 6.4 GALLON CAPACITY	3/4"	-	EQUIPMENT: AMTROL ST-12	SEE NOTE 5
RCP1	CIRCULATION PUMP, STAINLESS STEEL	3/4"	3/4"	PUMP: B&G NBF-25, 1/8 HP, 120V RATED FOR 6 GPM AT 8' HD	SEE NOTES 6 & 7
RCP2	CIRCULATION PUMP, STAINLESS STEEL	3/4"	3/4"	PUMP: B&G NBF-25, 1/8 HP, 120V RATED FOR 6 GPM AT 8' HD	SEE NOTES 6 & 7
MV1	THERMOSTATIC MIXING VALVE CONTROL STATION, BUILDING FIXTURES	1"	1"	TMV: LEONARD 3NB-LF MIN. GPM: 1.0 MAX GPM: 40 (AT 10 PSI LOSS) PRESSURE LOSS: 5 PSI (26 GPM) LEAVING TEMP: SEE NOTE 8	SEE NOTE 8 SEE 6/P5.02
MV2	THERMOSTATIC MIXING VALVE CONTROL STATION, BUILDING FIXTURES	1"	1"	TMV: LEONARD 3NB-LF MIN. GPM: 1.0 MAX GPM: 40 (AT 10 PSI LOSS) PRESSURE LOSS: 5 PSI (26 GPM) LEAVING TEMP: SEE NOTE 8	SEE NOTE 8 SEE 6/P5.02
MV3	THERMOSTATIC MIXING VALVE MECHANICAL, PUBLIC LAVATORIES	1"	1"	TMV: SYMMONS 7-225-CK SERIES MIN. GPM: 0.5 MAX GPM: 4.5 PRESSURE LOSS: 5 PSI LEAVING TEMP: 105 DEG. F	SEE NOTE 9
AC1	AIR COMPRESSOR, SIMPLEX, TWO-STAGE	1"	1"	EQUIP: QUINCY Q75-XTREME ELECTRICAL: 5 HP, 480V, 3P CFH: 17.4 @ 175 PSIG RECEIVER: 80 GAL.	SEE NOTES 10 - 13 SEE 8/P5.02
HR1	HOSE REEL, AIR OR WATER, SPRING RETRACABLE, 35 FT HOSE, 300 PSI MAX.	1/2"	1/2"	REEL CRAFT 5635 OLP	SEE NOTE 14

NOTES:  
 1. WATER HEATER SHALL MEET OR EXCEED THE REQUIREMENTS OF ASHRAE 90.1.  
 2. PROVIDE WATER HEATER WITH ACID NEUTRALIZATION KIT FOR CONDENSATE.  
 3. INSTALL DIRECT-VENT PIPING PER MANUFACTURER'S DIRECTION. CPVC OR STAINLESS STEEL SHALL BE USED FOR VENT PIPING MATERIAL. PVC IS NOT ACCEPTABLE.  
 4. PROVIDE CARBON MONOXIDE DETECTOR ADJACENT TO WATER HEATER. INTERLOCK CARBON MONOXIDE DETECTOR WITH BAS.  
 5. EXPANSION TANK SHALL BE CHARGED TO MEET FINAL OPERATING PRESSURE FOR DOMESTIC WATER SYSTEM. PUMP SHALL BE ALL BRONZE CONSTRUCTION.  
 7. INTERLOCK WITH FULLY ADJUSTABLE AQUASTAT AND 7-DAY, 24 HOUR TIMER OR PROVIDE 7-DAY, 24 HOUR ACCESS CONTROL VIA BAS.  
 8. PROVIDE TEMPERATURE MIXING VALVE FOR THE BUILDING HOT WATER SYSTEM TO TEMPER 140 DEGREE STORED HOT WATER TO 120 DEGREES TO THE BUILDING FIXTURES.  
 9. PROVIDE POINT-OF-USE TMV AT EACH PUBLIC ACCESSIBLE HAND-WASHING LAVATORY TO TEMPER HOT WATER TO A MAXIMUM OF 105 DEGREES. INSTALL BELOW SINK IN AN ACCESSIBLE LOCATION.  
 10. PROVIDE REFRIGERATED AIR DRYER EQUAL TO AURORA MODEL RDV-0030, 30 SCFM @ 100 PSIG, 1/4 HP, 115V, SINGLE PHASE, 60 HZ.  
 11. PROVIDE COMPRESSOR WITH LOW SOUND ATTENUATING ENCLOSURE (64 DBA).  
 12. PROVIDE AIR COMPRESSOR WITH BLOW DOWN MUFFLER.  
 13. VERIFY HOSE REEL INSTALLATION LOCATIONS WITH OWNER PRIOR TO PERFORMING ANY WORK.  
 \*\* MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

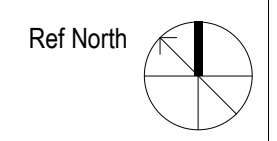
APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	WH - GAS-FIRED EXPANSION TANKS PUMPS MIXING VALVES AIR COMPRESSOR AC DRYER	A.O. SMITH, BRADFORD WHITE, LOCHINVAR AMTROL, A.O. SMITH, WATTS, WESSLES B&G, TACO, ARMSTRONG ARMSTRONG, LAWLER, LEONARD, SYMMONS CHAMPION, CURTIS, QUINCY AURORA, PNEUMATECH, HANKINSON

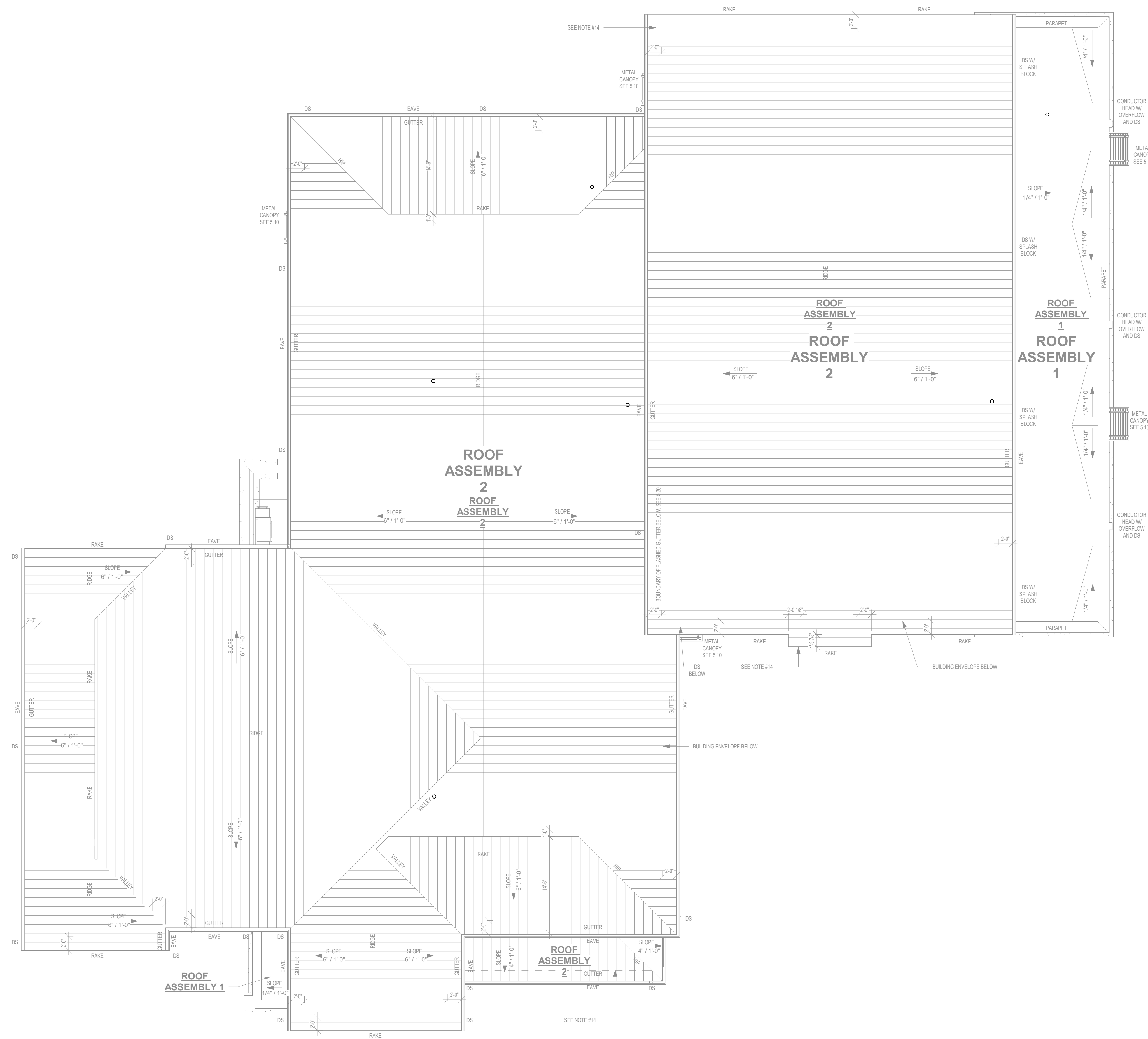




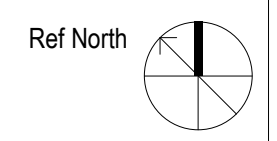
**2** MEZZANINE DRAINAGE PIPING FLOOR PLAN  
1/8" = 1'-0"

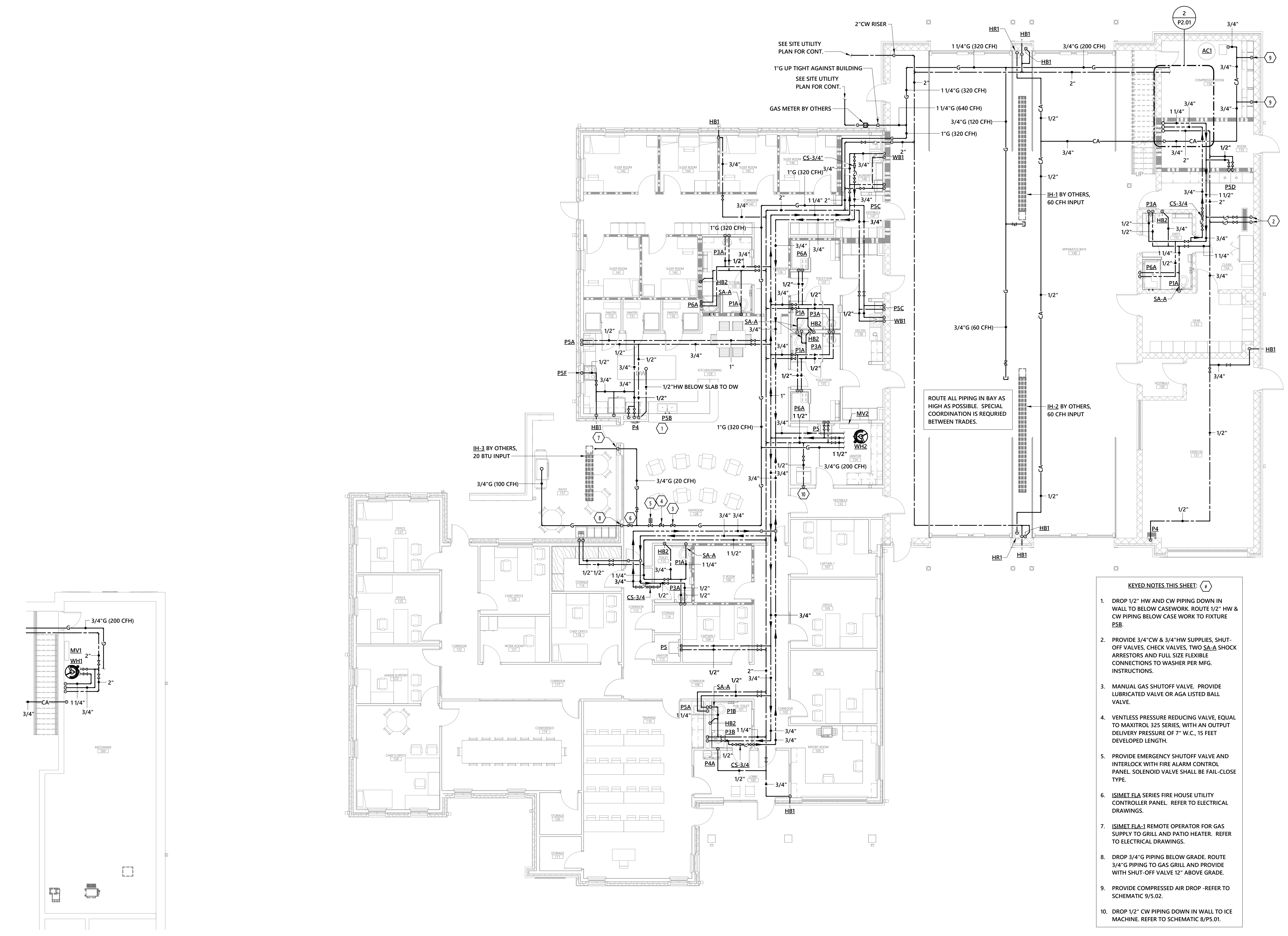
**1** FIRST FLOOR DRAINAGE PIPING FLOOR PLAN  
1/8" = 1'-0"





**1** DRAINAGE PIPING ROOF PLAN  
1/8" = 1'-0"

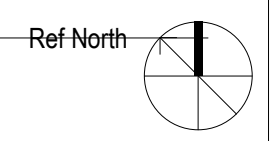


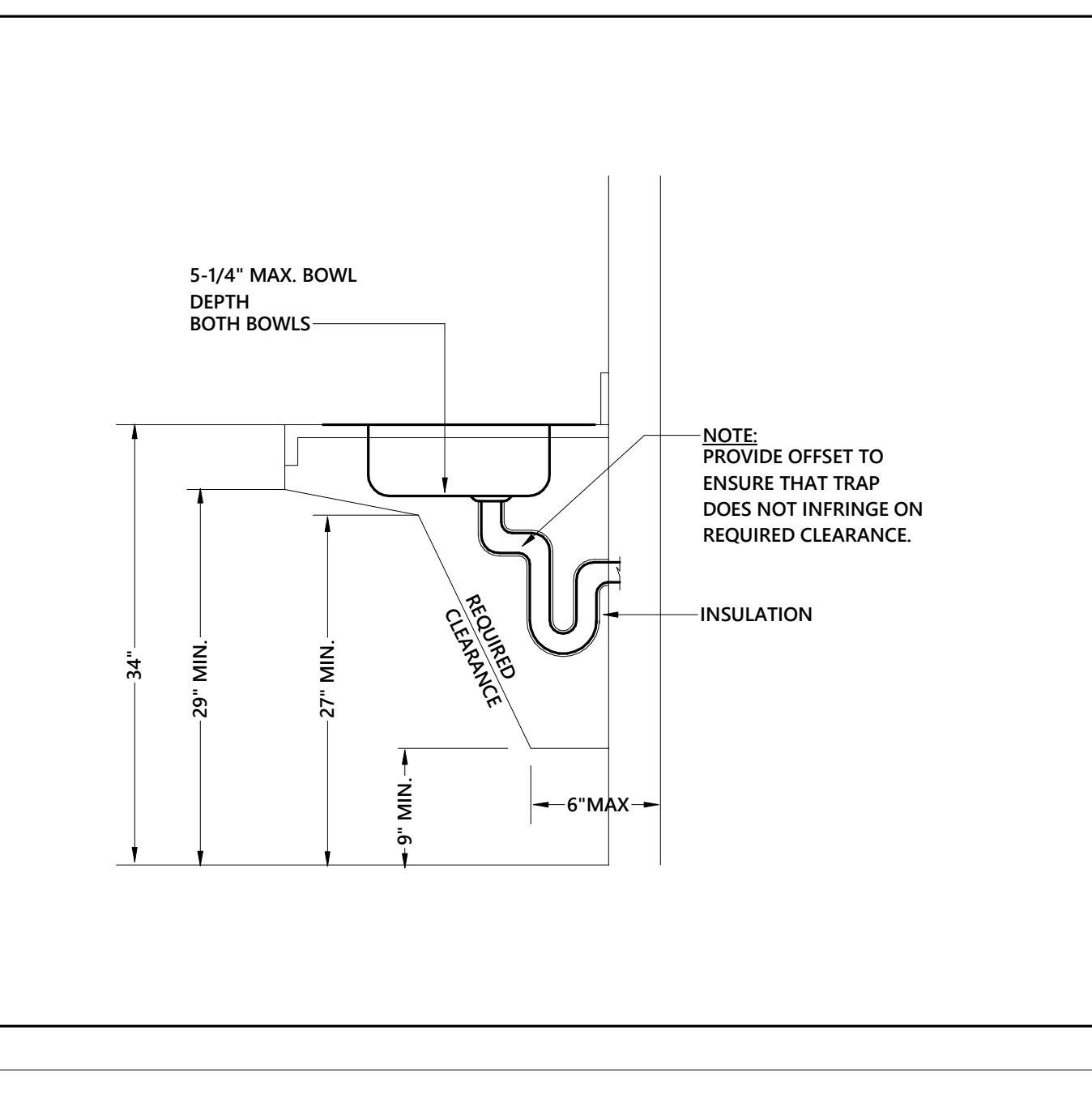
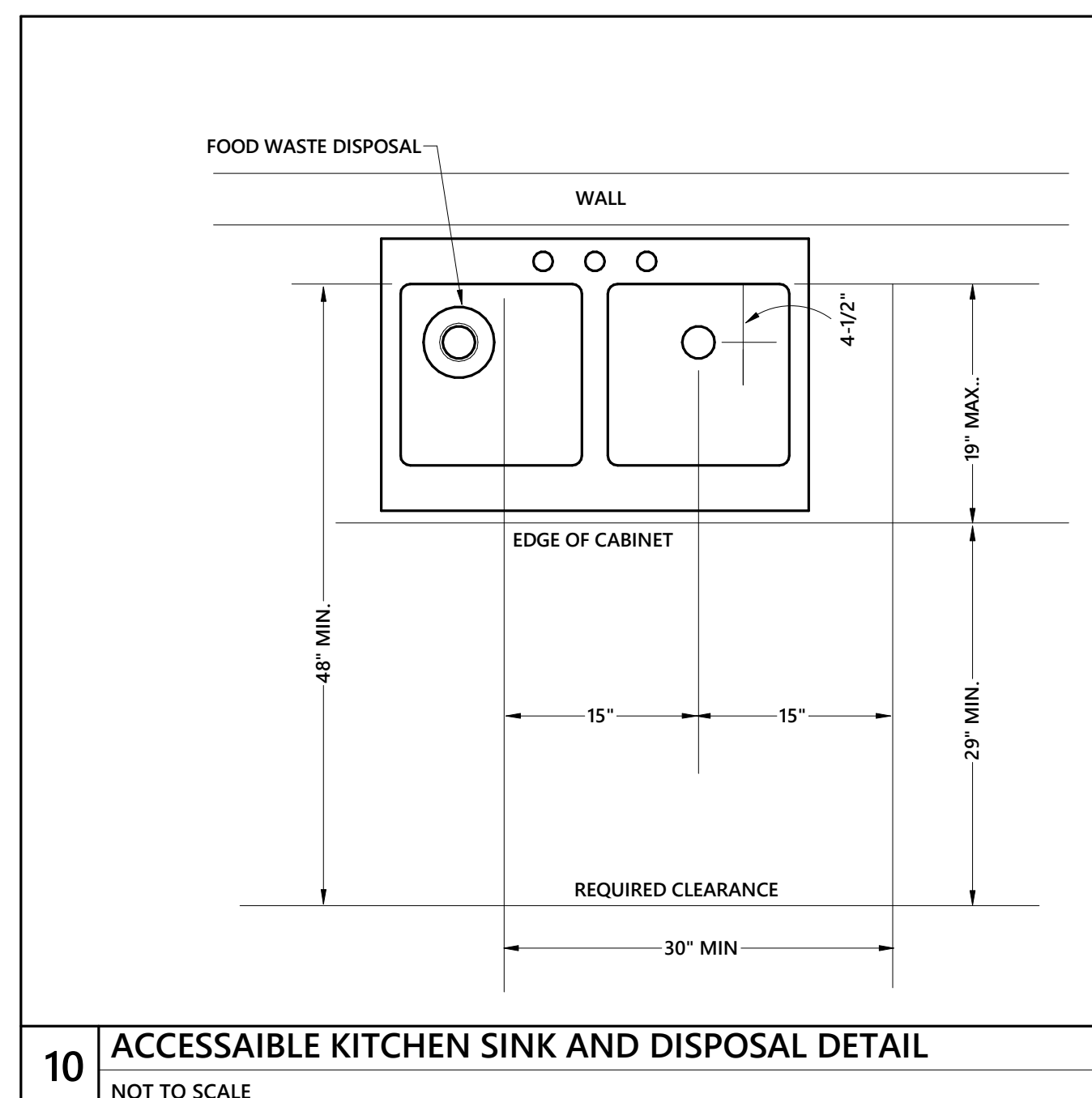
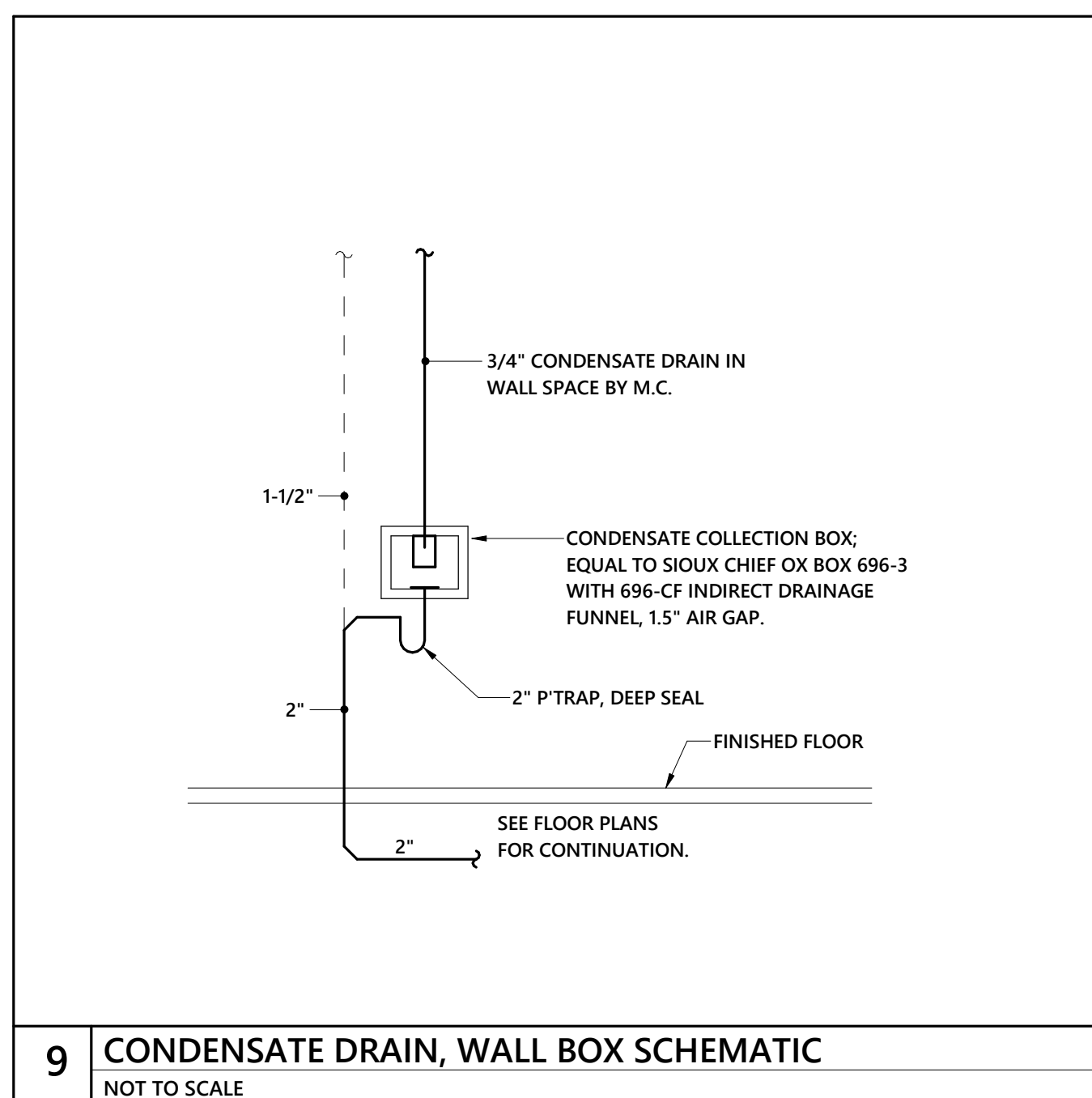
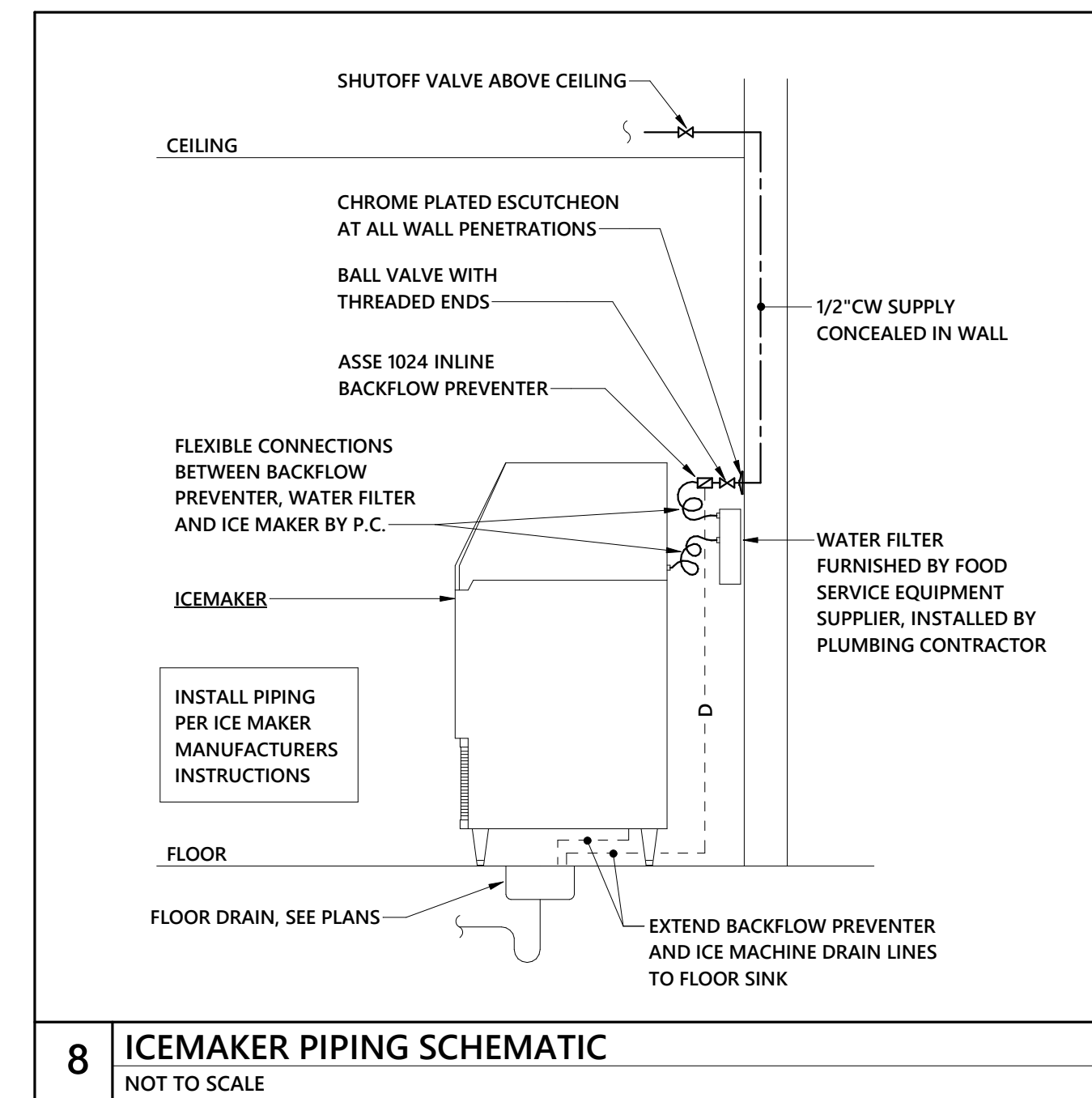
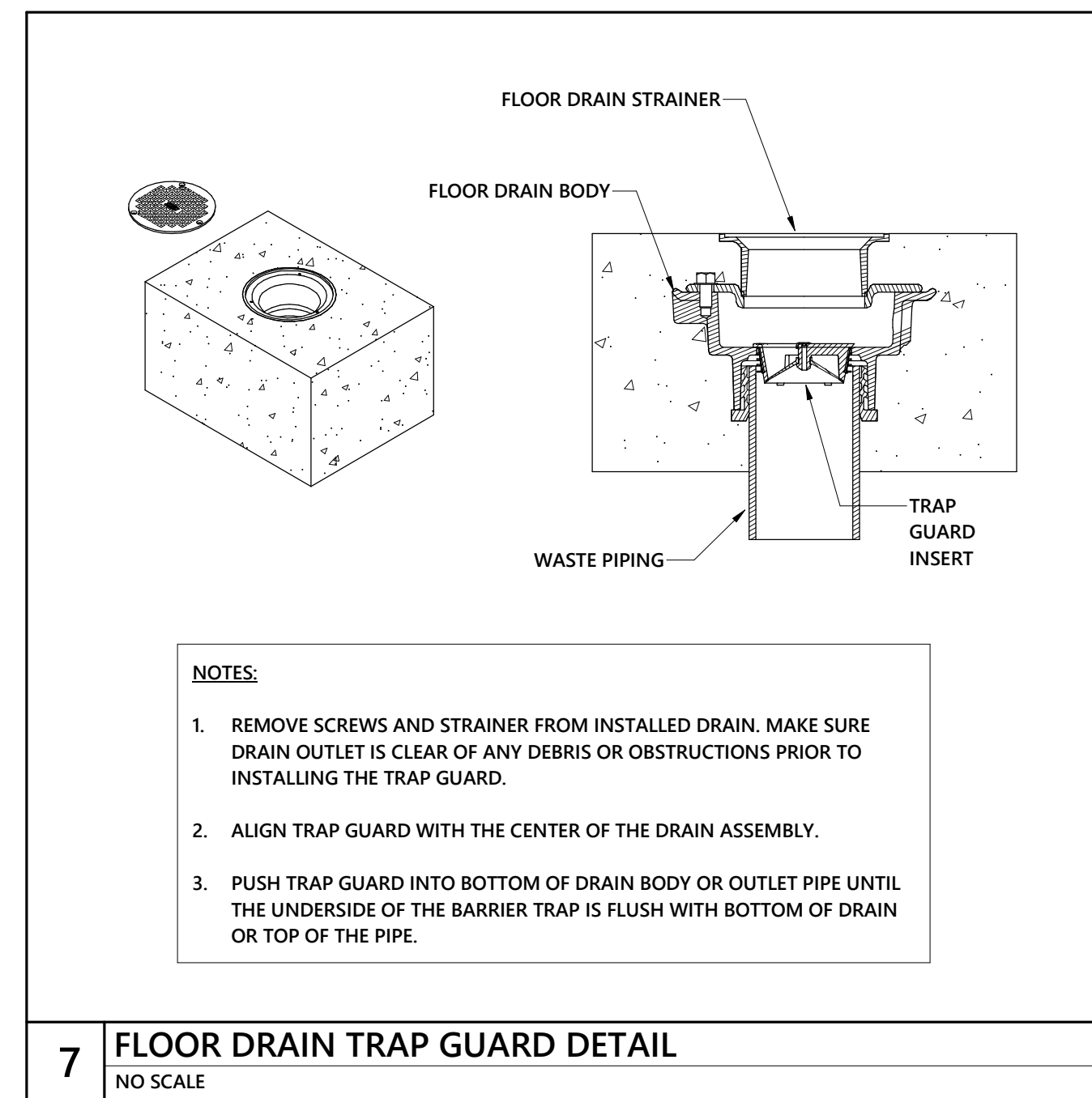
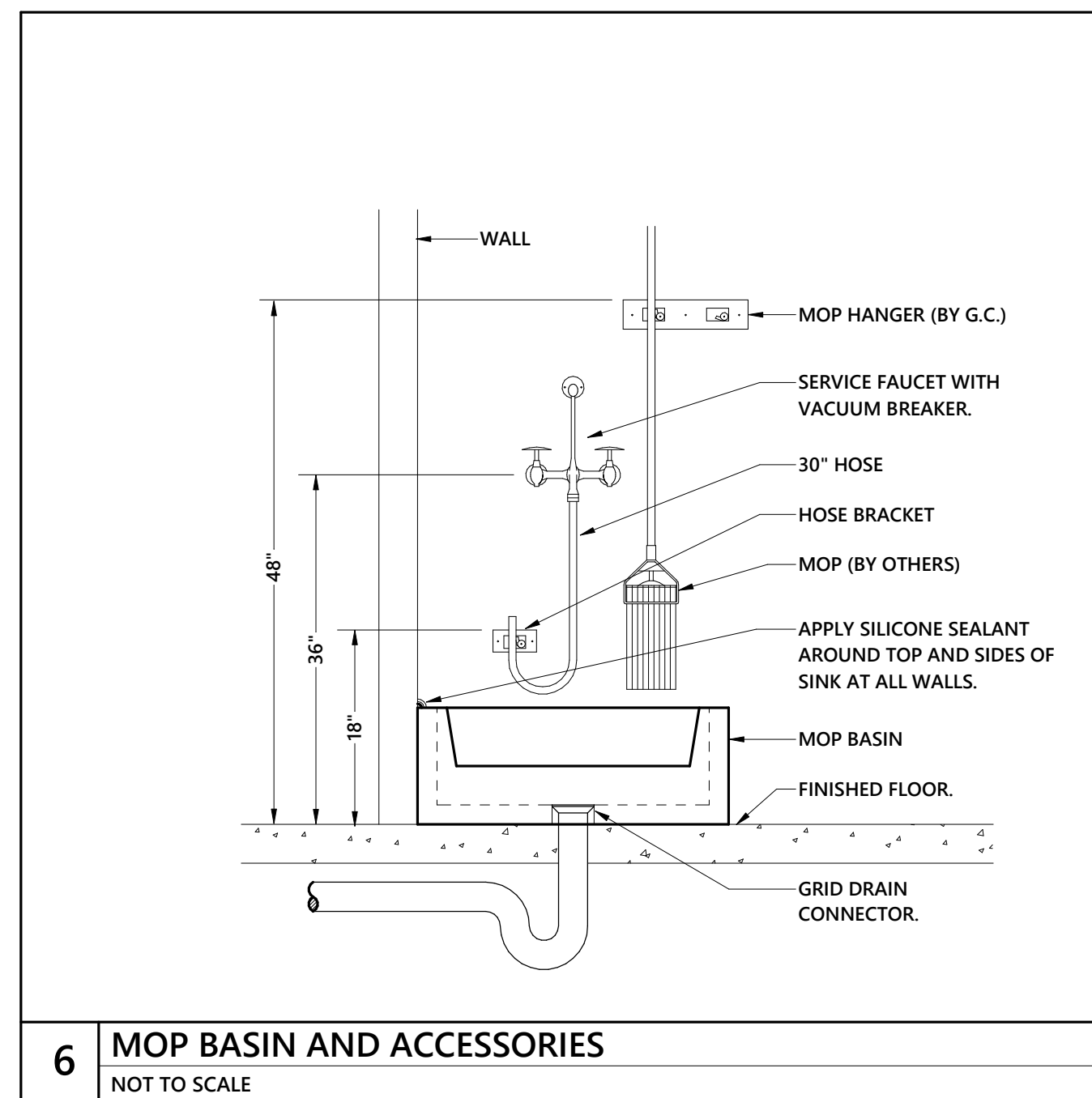
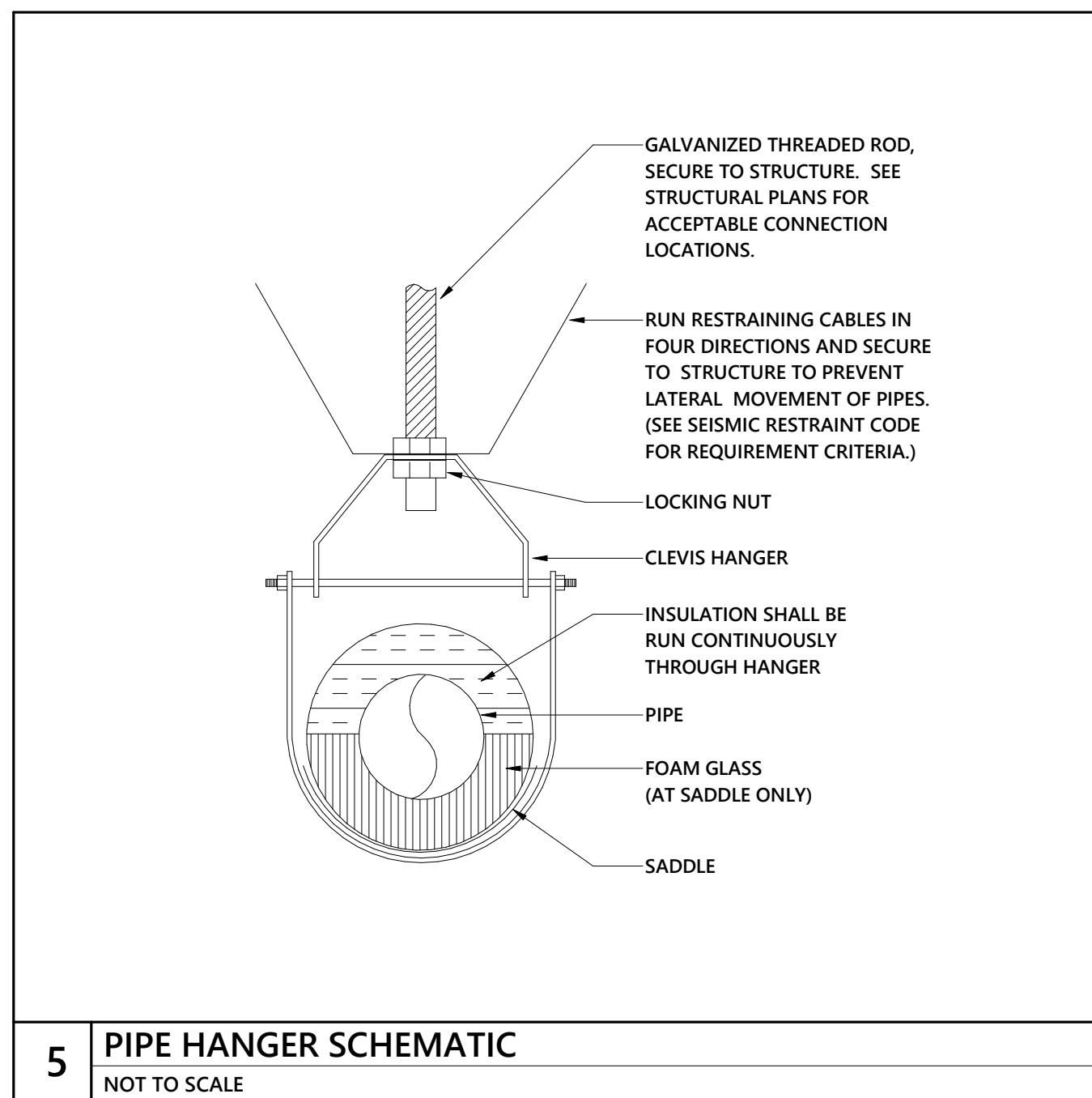
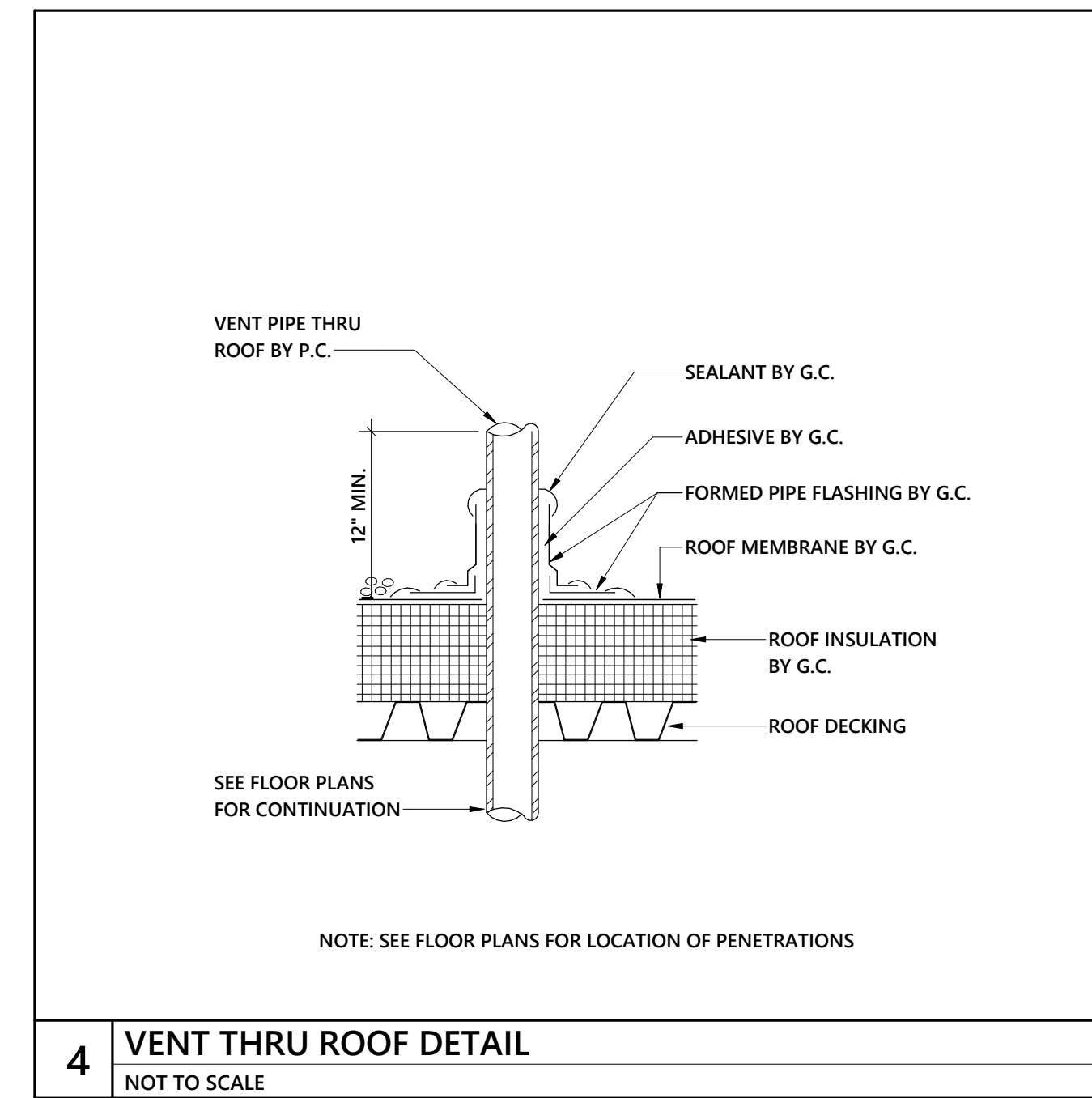
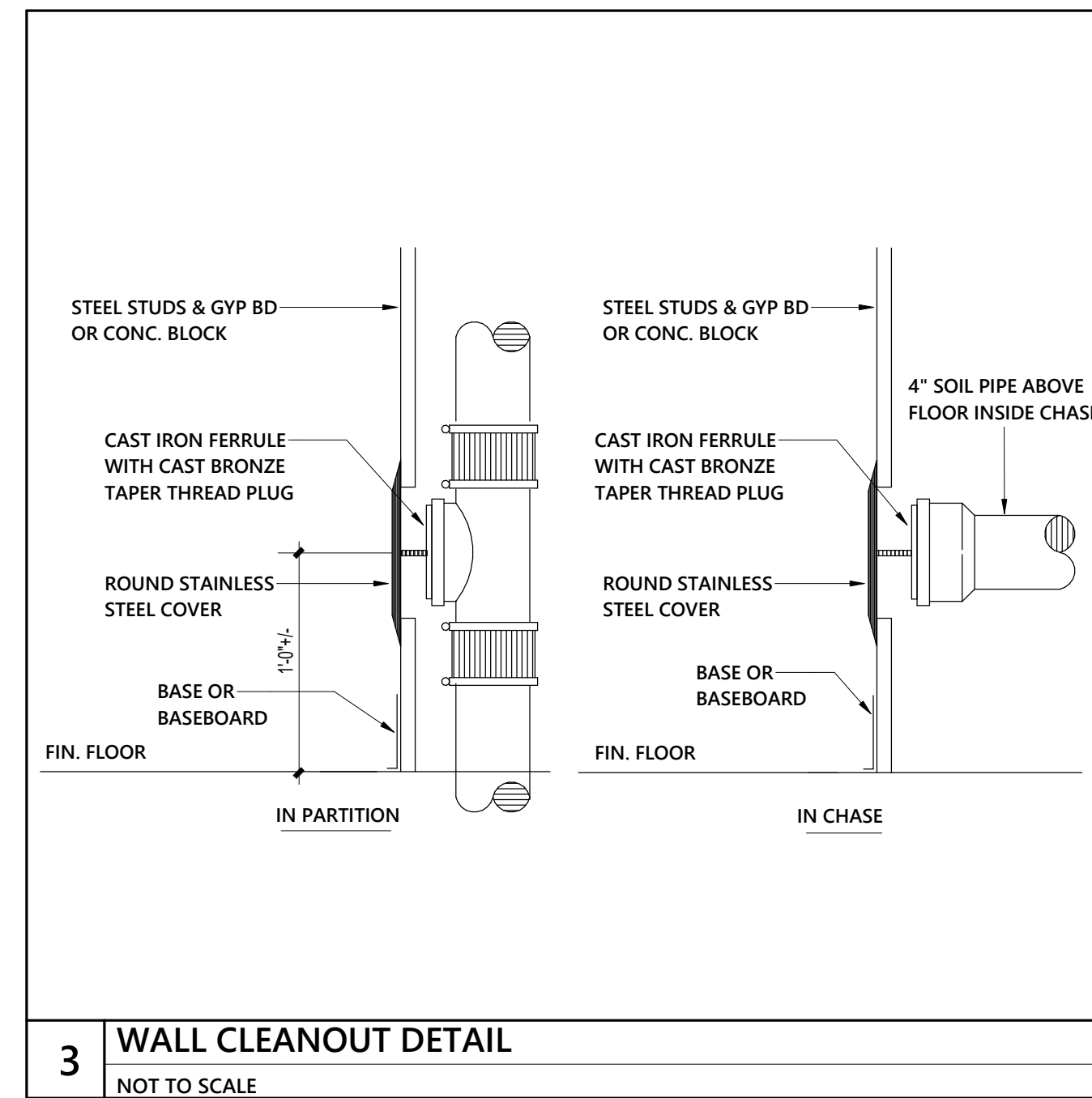
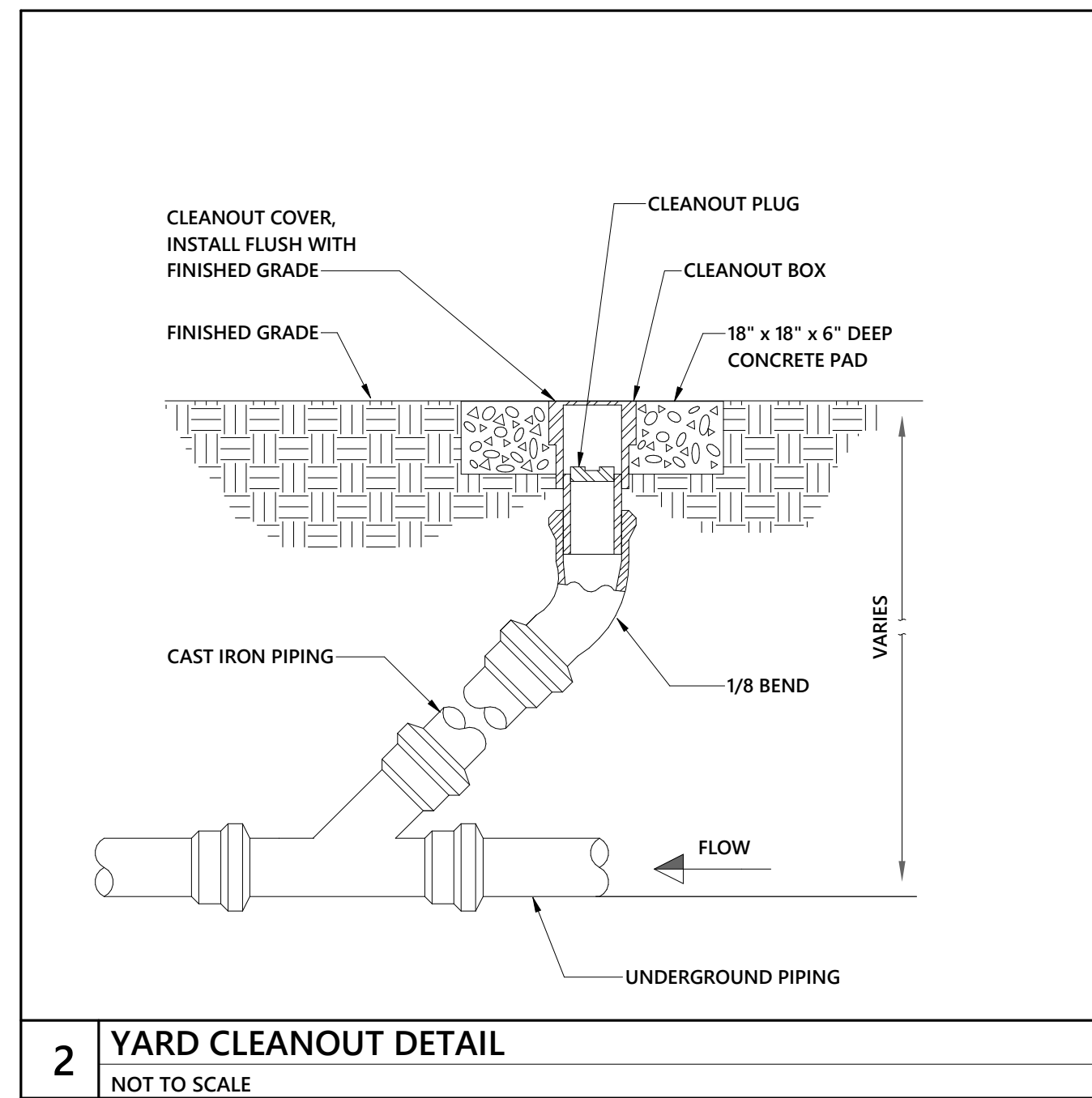
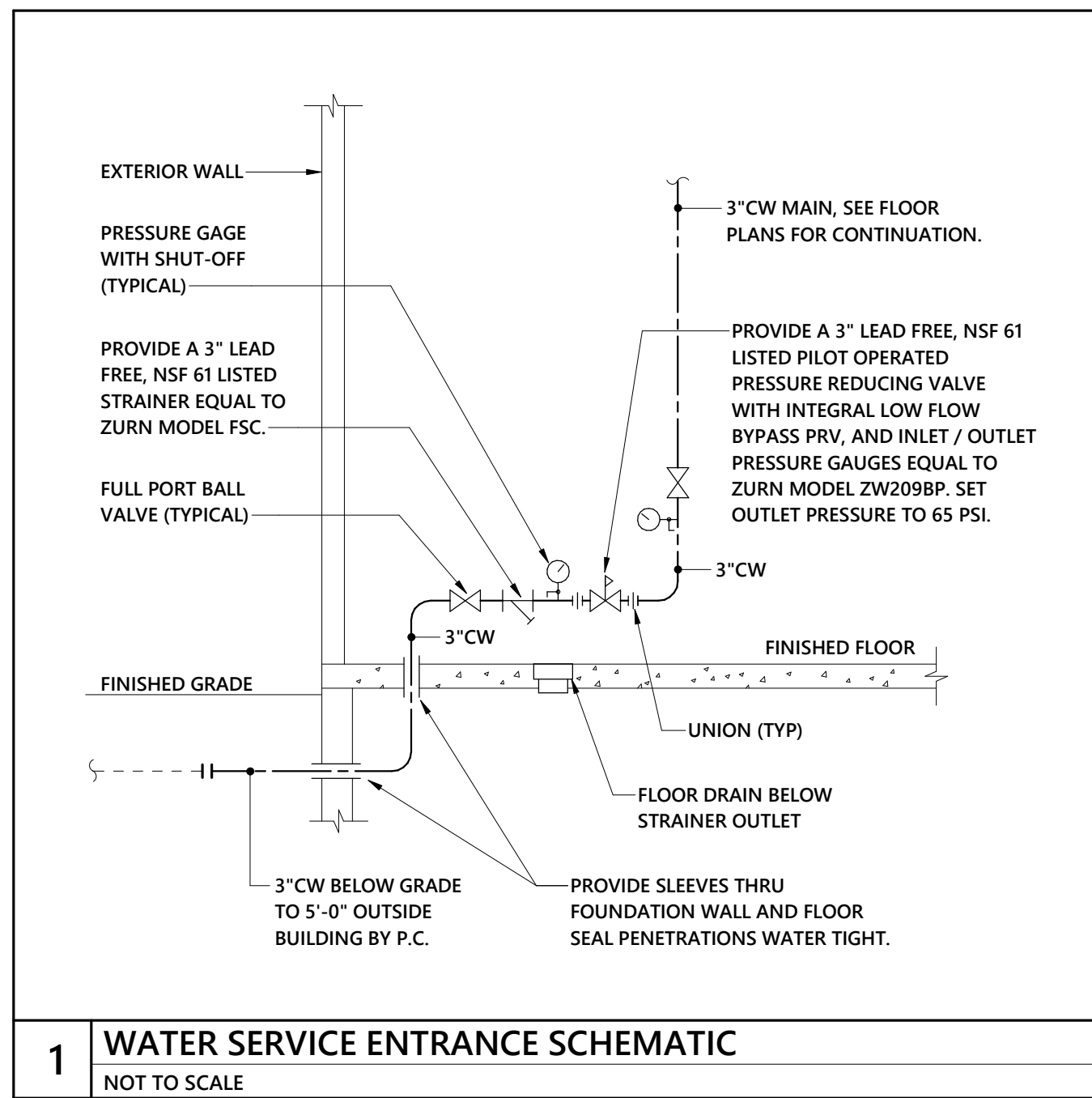


- KEYED NOTES THIS SHEET:**
- DROP 1/2" HW AND CW PIPING DOWN IN WALL TO BELOW CASEWORK. ROUTE 1/2" HW & CW PIPING BELOW CASE WORK TO FIXTURE PSB.
  - PROVIDE 3/4" CW & 3/4" HW SUPPLIES, SHUT-OFF VALVES, CHECK VALVES, TWO SA-A SHOCK ARRESTORS AND FULL SIZE FLEXIBLE CONNECTIONS TO WASHER PER MFG. INSTRUCTIONS.
  - MANUAL GAS SHUTOFF VALVE. PROVIDE LUBRICATED VALVE OR AGA LISTED BALL VALVE.
  - VENTLESS PRESSURE REDUCING VALVE, EQUAL TO MAXITROL 325 SERIES, WITH AN OUTPUT DELIVERY PRESSURE OF 7" W.C., 15 FEET DEVELOPED LENGTH.
  - PROVIDE EMERGENCY SHUTOFF VALVE AND INTERLOCK WITH FIRE ALARM CONTROL PANEL. SOLENOID VALVE SHALL BE FAIL-CLOSE TYPE.
  - ISIMET ELA SERIES FIRE HOUSE UTILITY CONTROLLER PANEL. REFER TO ELECTRICAL DRAWINGS.
  - ISIMET ELA-1 REMOTE OPERATOR FOR GAS SUPPLY TO GRILL AND PATIO HEATER. REFER TO ELECTRICAL DRAWINGS.
  - DROP 3/4" G PIPING BELOW GRADE. ROUTE 3/4" G PIPING TO GAS GRILL AND PROVIDE WITH SHUT-OFF VALVE 12" ABOVE GRADE.
  - PROVIDE COMPRESSED AIR DROP - REFER TO SCHEMATIC 9/5.02.
  - DROP 1/2" CW PIPING DOWN IN WALL TO ICE MACHINE. REFER TO SCHEMATIC 8/P5.01.

**2** MEZZANINE SUPPLY PIPING FLOOR PLAN  
1/8" = 1'-0"

**1** FIRST FLOOR SUPPLY PIPING FLOOR PLAN  
1/8" = 1'-0"





Project No. **1691**  
Date: 3/28/2024 2:23:42 PM  
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Checked by:  
Checklist:  
Revisions:

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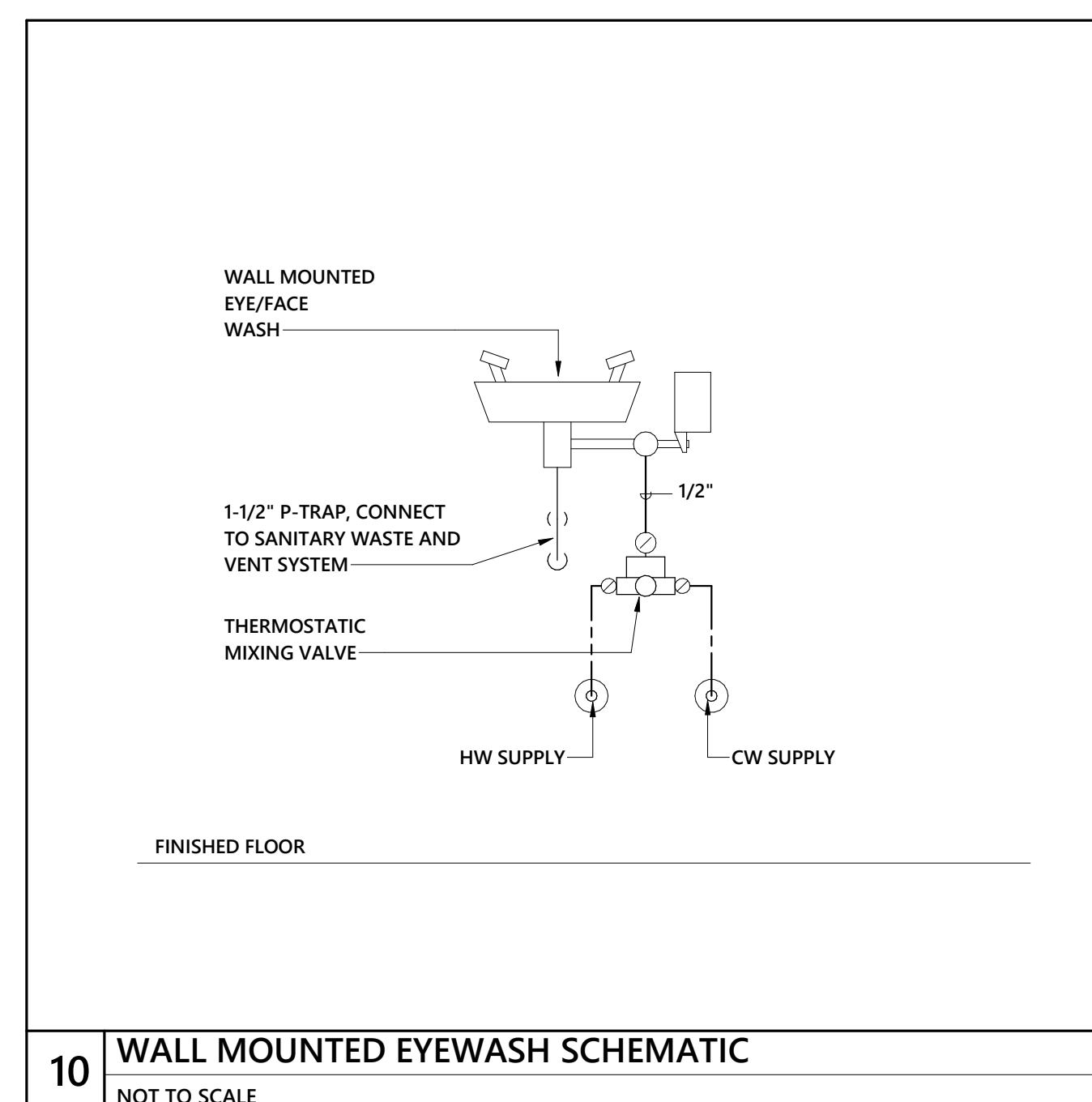
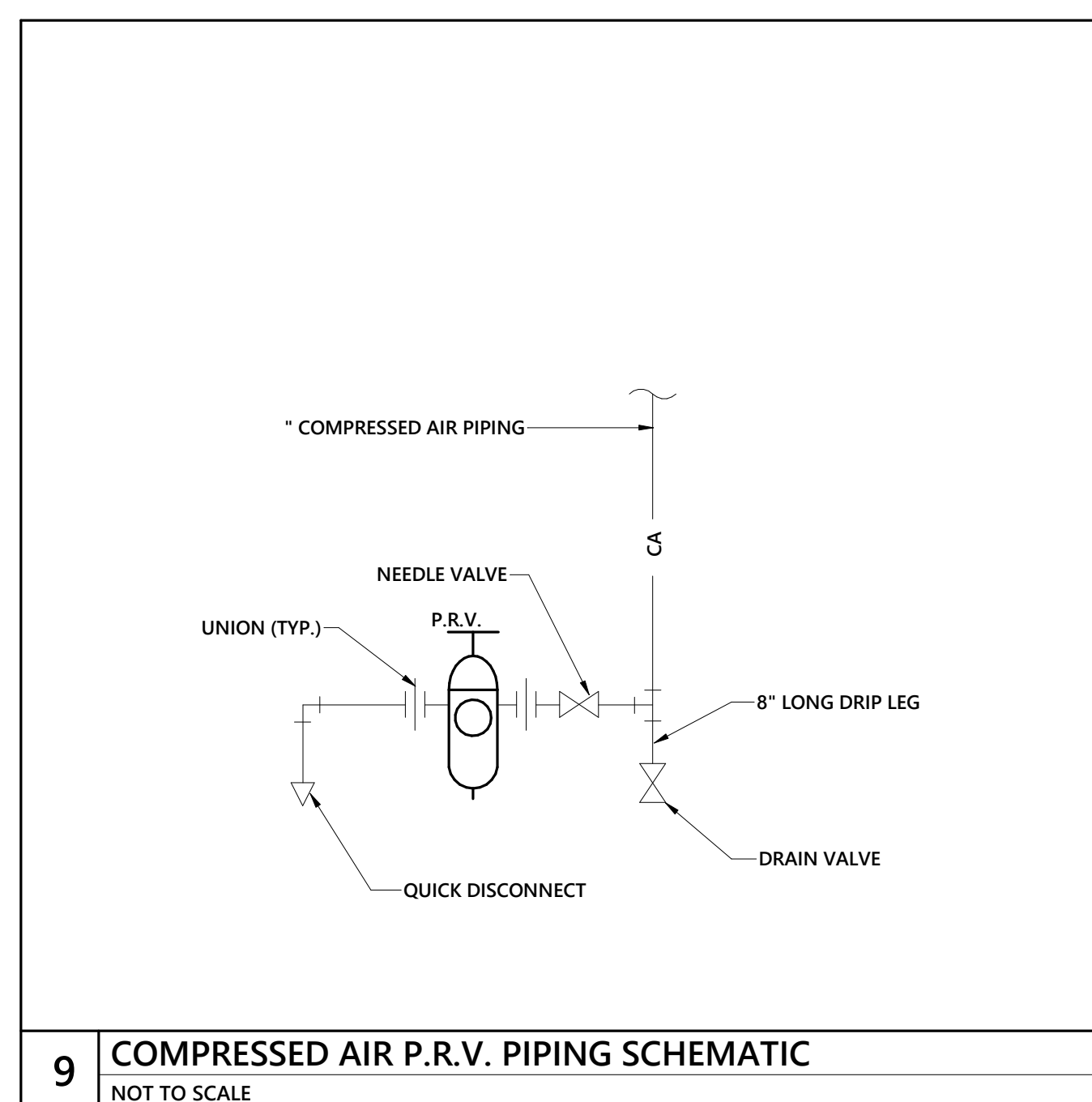
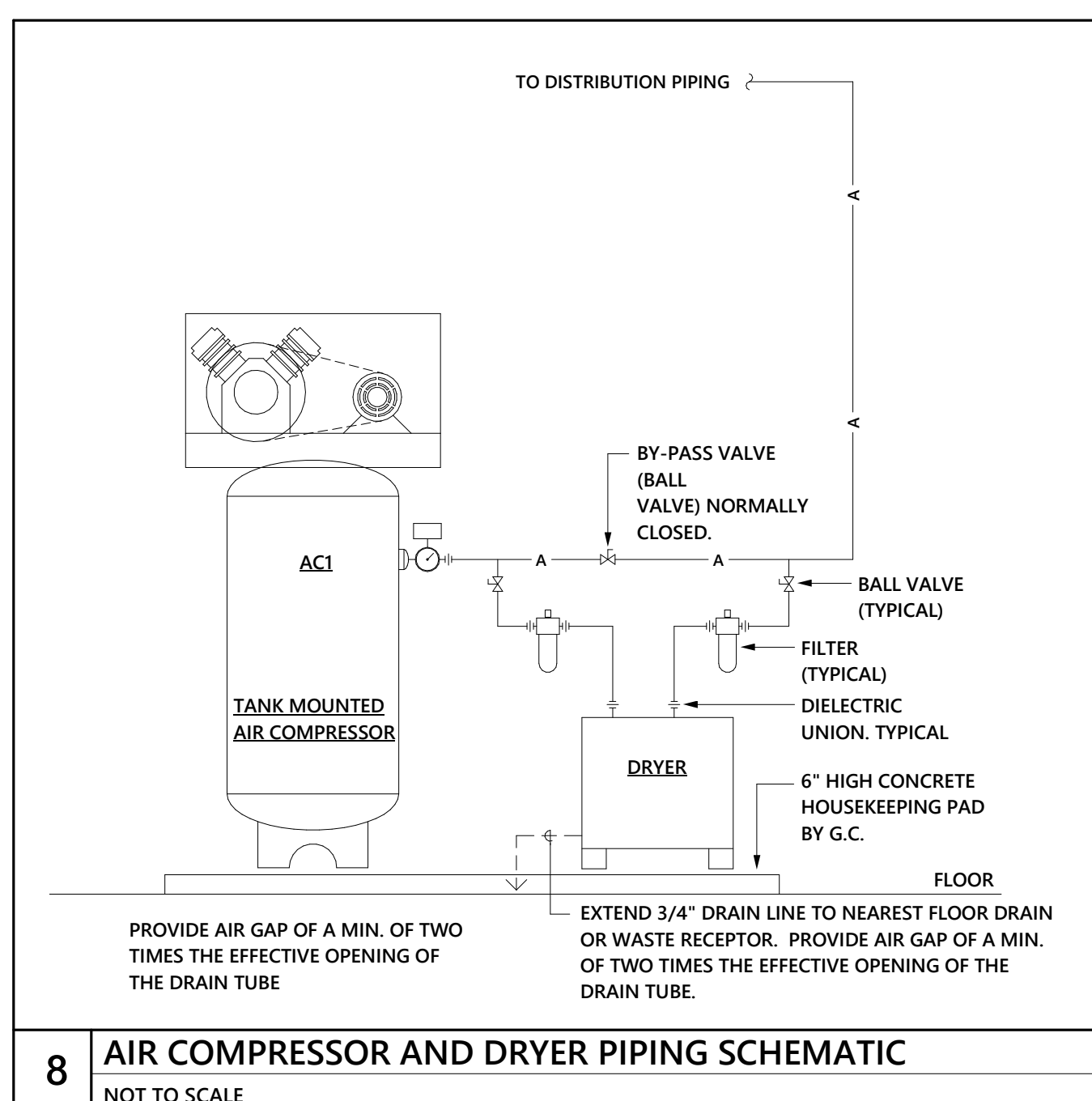
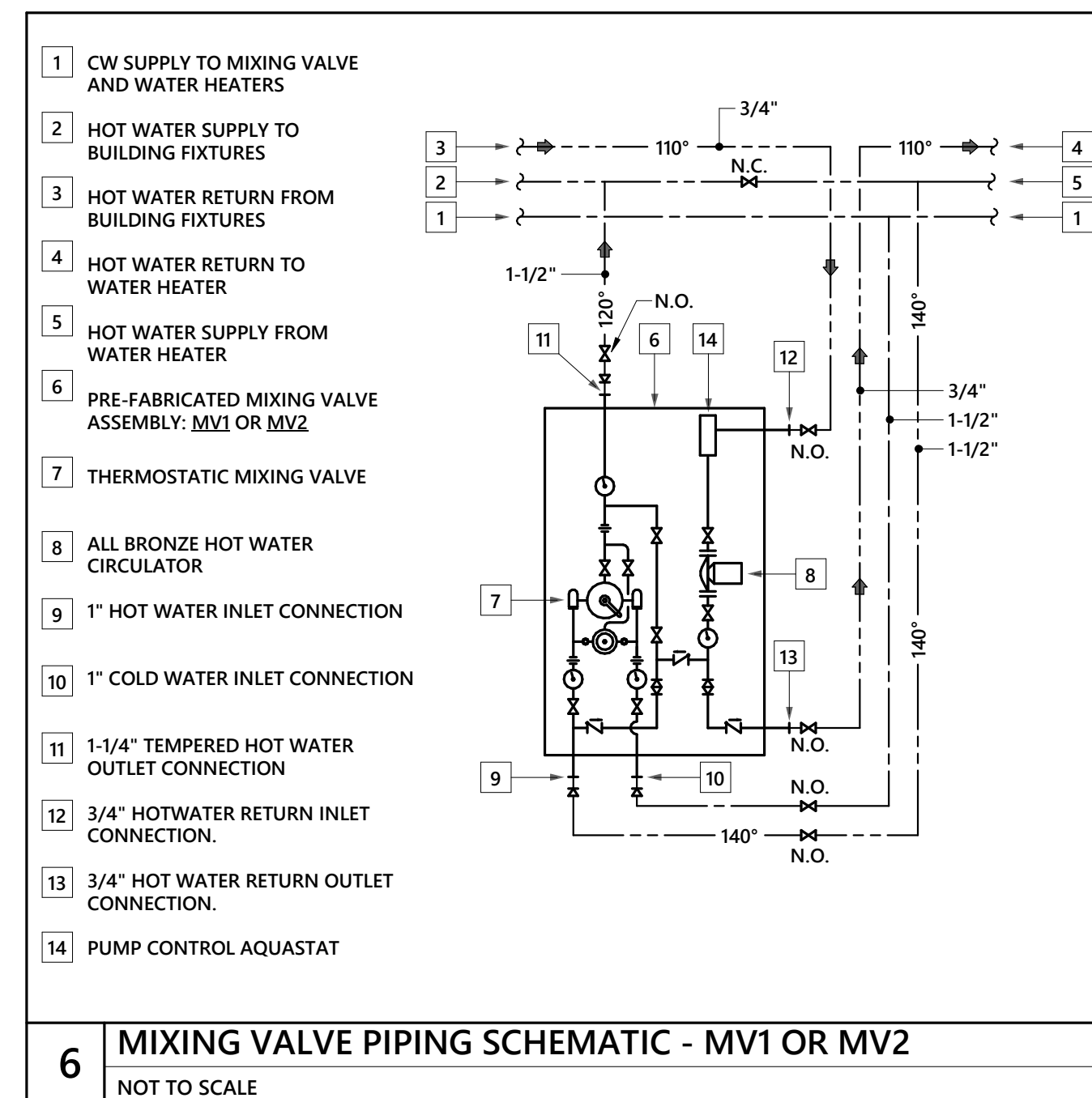
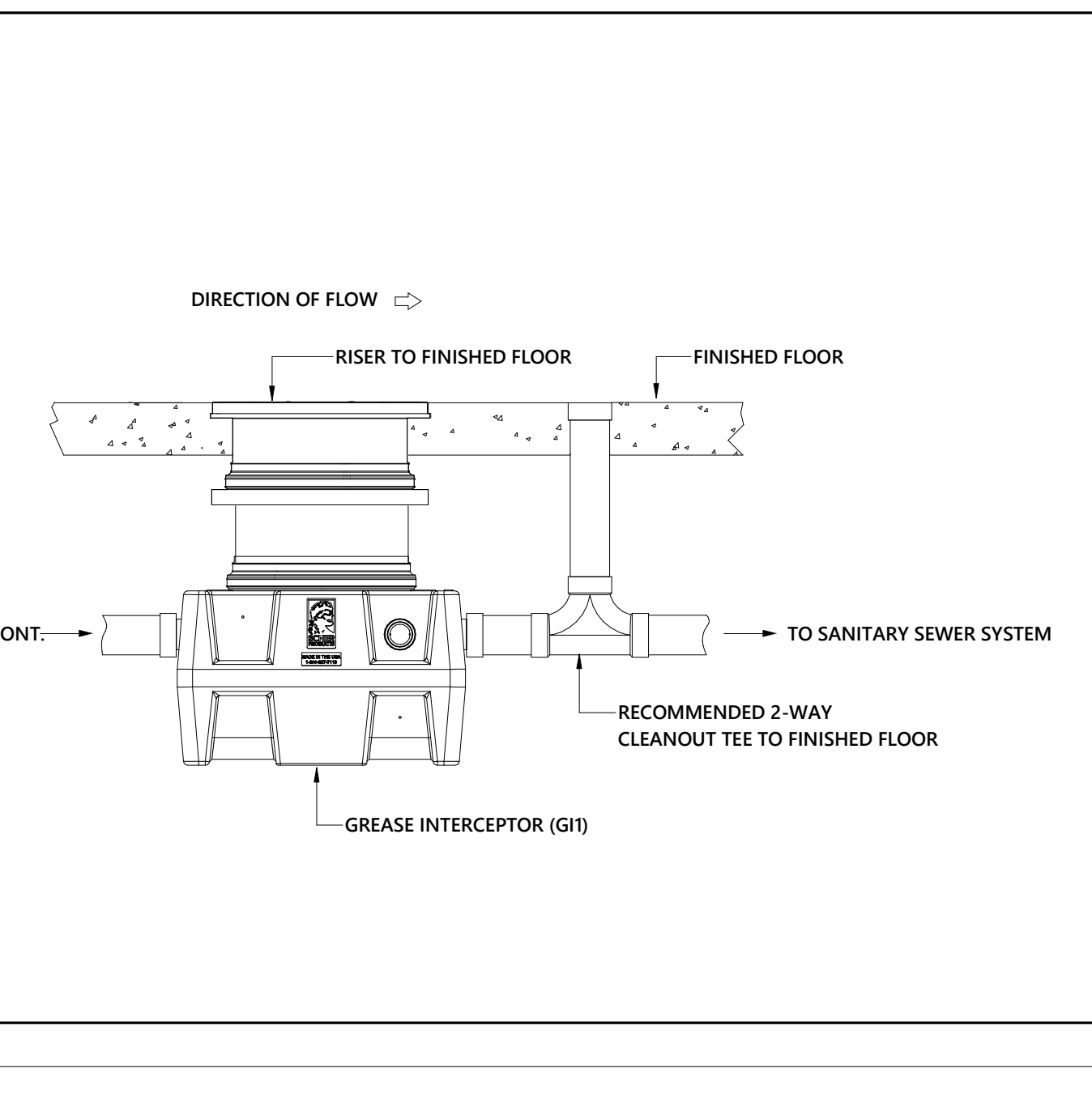
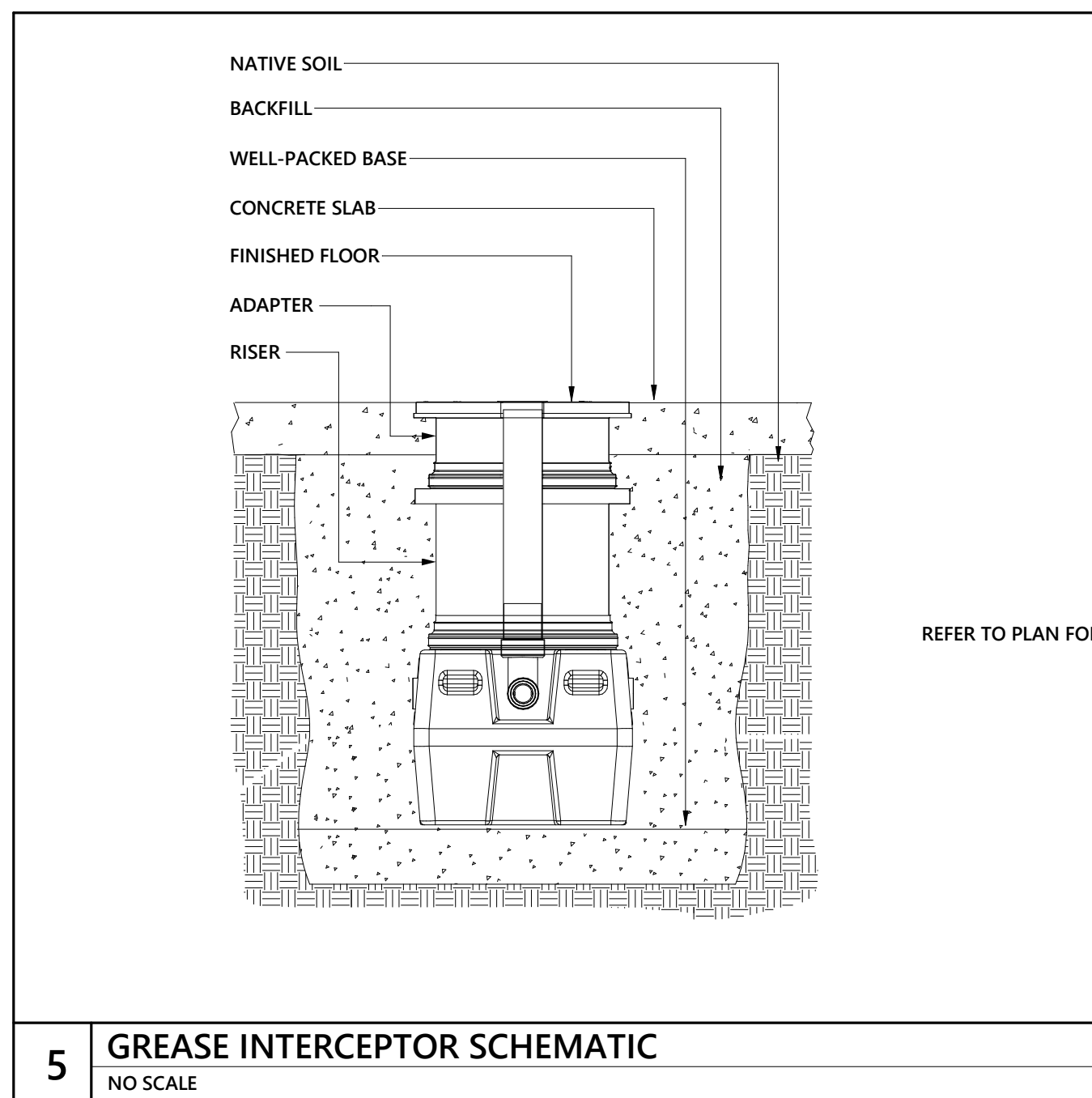
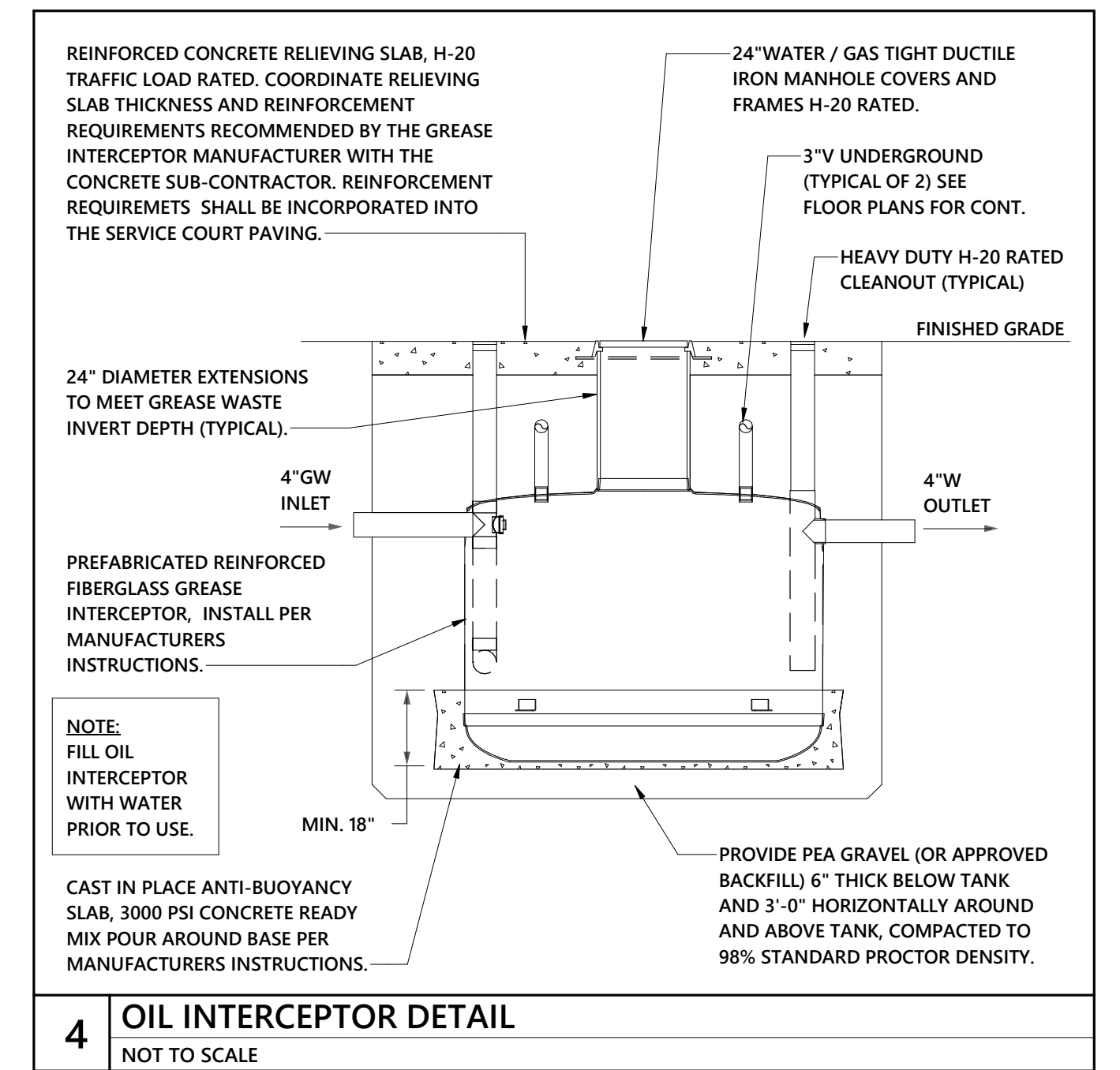
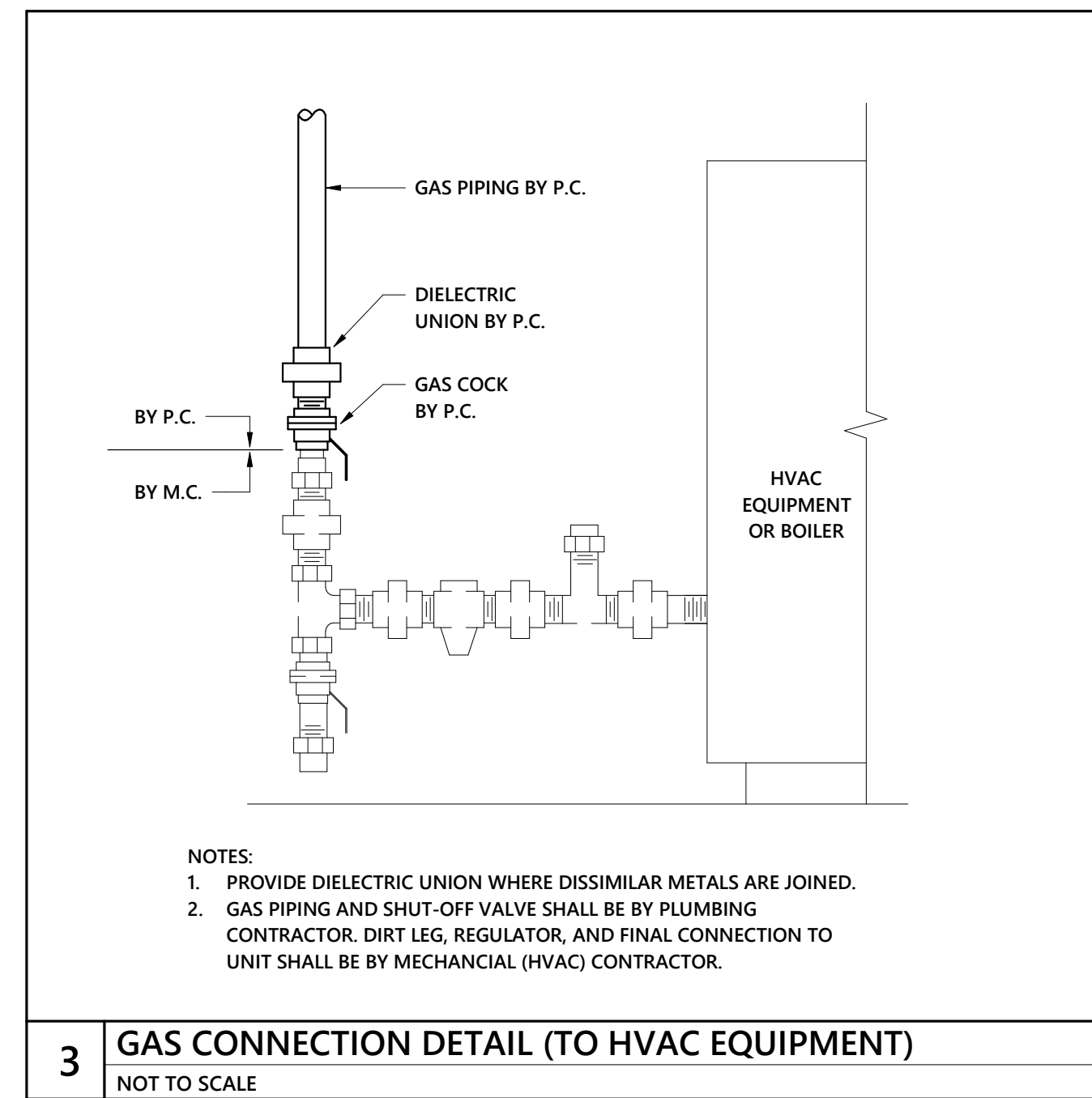
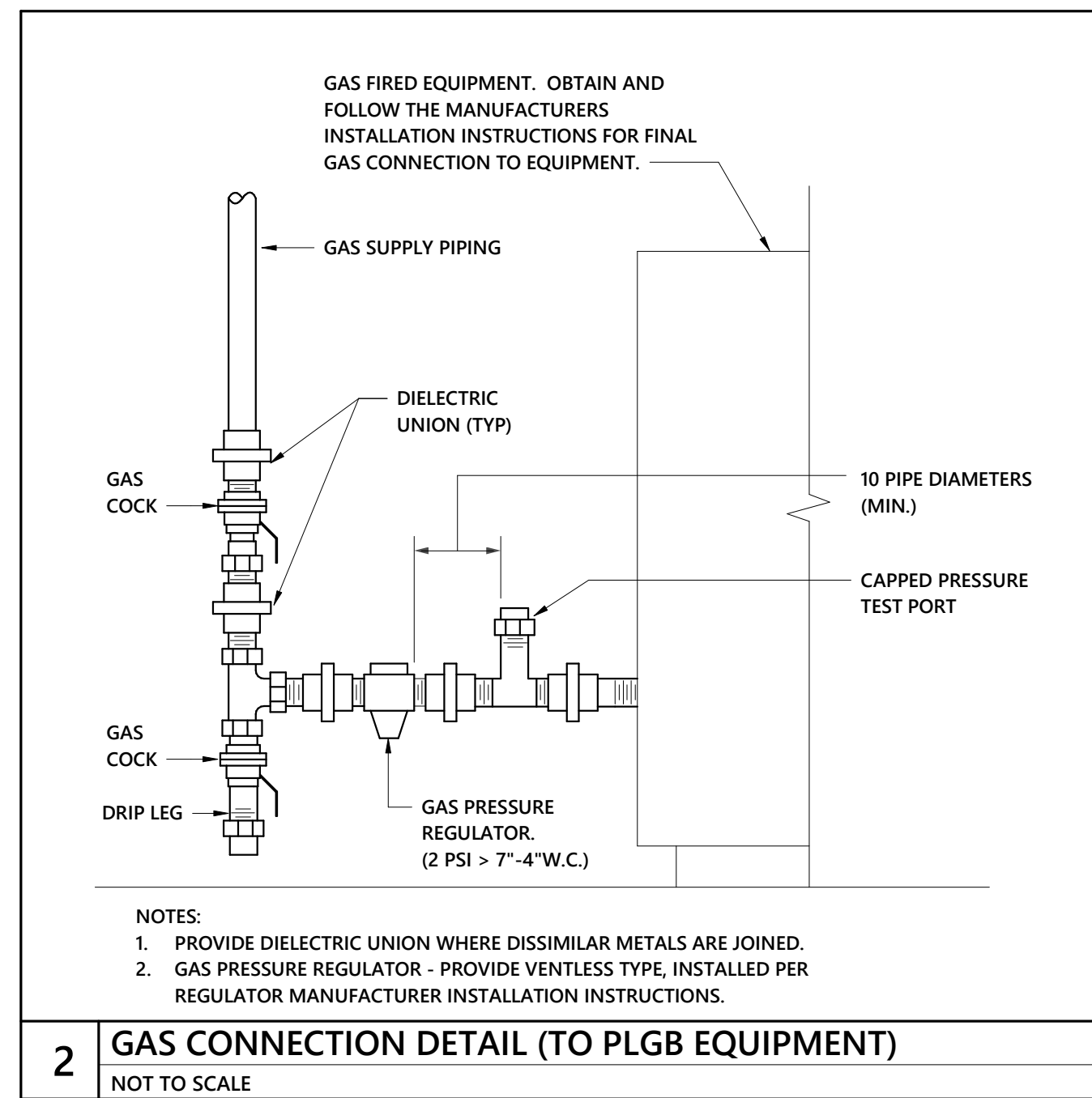
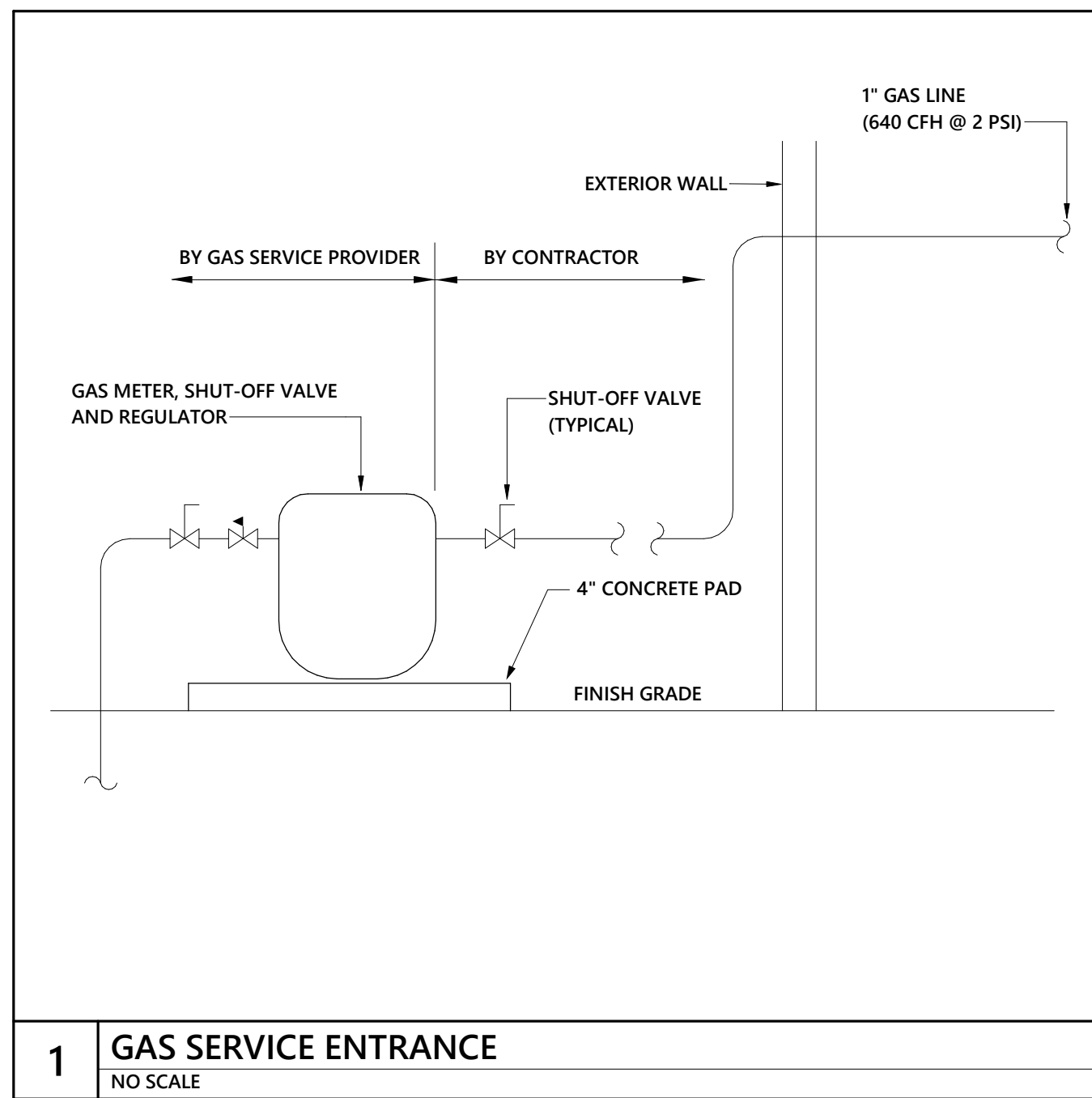
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**GORDON ROAD FIRE DEPARTMENT**  
PLUMBING DETAILS

03/28/2024

Sheet No. **P5.01**  
Opt # 22-0369





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**1691**  
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Revisions:

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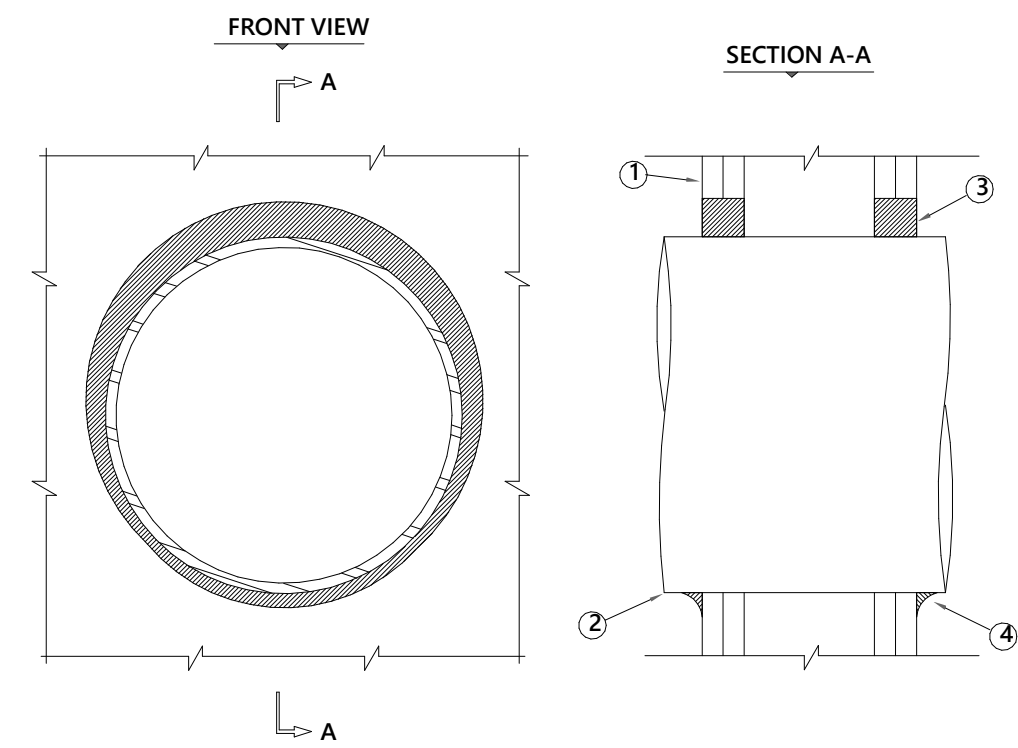
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No. 10000  
03/28/2024

GORDON ROAD FIRE DEPARTMENT  
PLUMBING DETAILS

Sheet No.  
**P5.02**



**U.L. SYSTEM NO. WL1054**  
**METAL PIPE THROUGH GYPSUM WALL ASSEMBLY**  
 F RATING = 1-HR OR 2-HR  
 T RATING = 0-HR  
 L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.  
 L RATING AT 400°F = 4 CFM/SQ. FT.



- GYPSUM-WALL ASSEMBLY (1-HR. AND 2-HR. FIRE RATING)(2-HR. SHOWN).
- PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
  - MAXIMUM 20" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
  - MAXIMUM 6" DIAMETER COPPER PIPE.
  - MAXIMUM 6" DIAMETER STEEL CONDUIT.
  - MAXIMUM 4" DIAMETER STEEL EMT.
- MINIMUM DEPTH
  - MINIMUM 5/8" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 1-HR. FIRE-RATING. B. MINIMUM 1-1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 2-HR. FIRE-RATING.
- MINIMUM 1/2" BEAD HILTI FS-ONE FIRESTOP SEALANT FOR POINT OF CONTACT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 22-1/4".  
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".

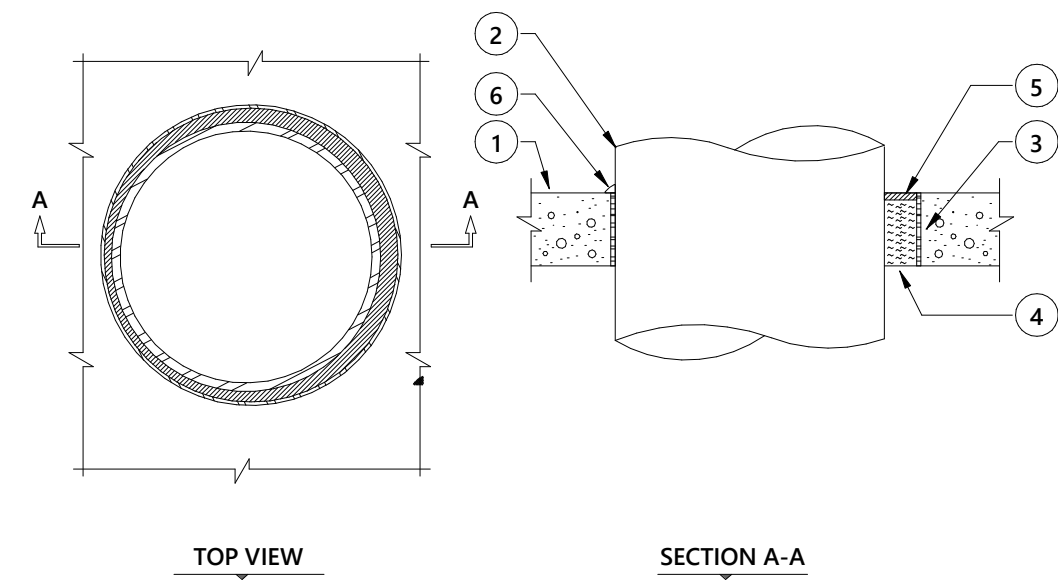
**INSTALLATION INSTRUCTIONS FOR UL NO. WL1054**

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

STEP 2 - FIRESTOP SEALANT: Apply a minimum 5/8" or 1-1/4" depth of FS-ONE in the annular space around the penetrating item. Tool excess sealant beyond perimeter of the opening 1/2" onto wall surface. Leave completed seal undisturbed for 48 hours.

**1 U.L. SYSTEM NO WL1054 DETAIL**  
 NOT TO SCALE

**U.L. SYSTEM NO. CAJ1155**  
**METAL PIPE THROUGH A SLEEVE IN CONCRETE WALL OR FLOOR**  
 F RATING = 3-HR.  
 T RATING = 0-HR.  
 L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.  
 L RATING AT 400°F = 4 CFM/SQ. FT.



- FLOOR OR WALL ASSEMBLY: B. U.L. CLASSIFIED CONCRETE BLOCK WALL (MINIMUM 8" BLOCK). A. MINIMUM 4-1/2" THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR.
- PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
  - MAXIMUM 20" DIAMETER STEEL PIPE.
  - MAXIMUM 6" DIAMETER COPPER PIPE.
  - MAXIMUM 6" DIAMETER STEEL CONDUIT.
  - MAXIMUM 4" DIAMETER EMT.
- OPTIONAL: MAXIMUM 22" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).
- MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) RECESSED 1/2" FROM TOP OF SLEEVE.
- MINIMUM 1/2" DEPTH HILTI FS-ONE FIRESTOP SEALANT.
- A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP SEALANT AROUND OUTER PERIMETER OF STEEL SLEEVE.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 22".  
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

**INSTALLATION INSTRUCTIONS FOR UL NO. CAJ1155**

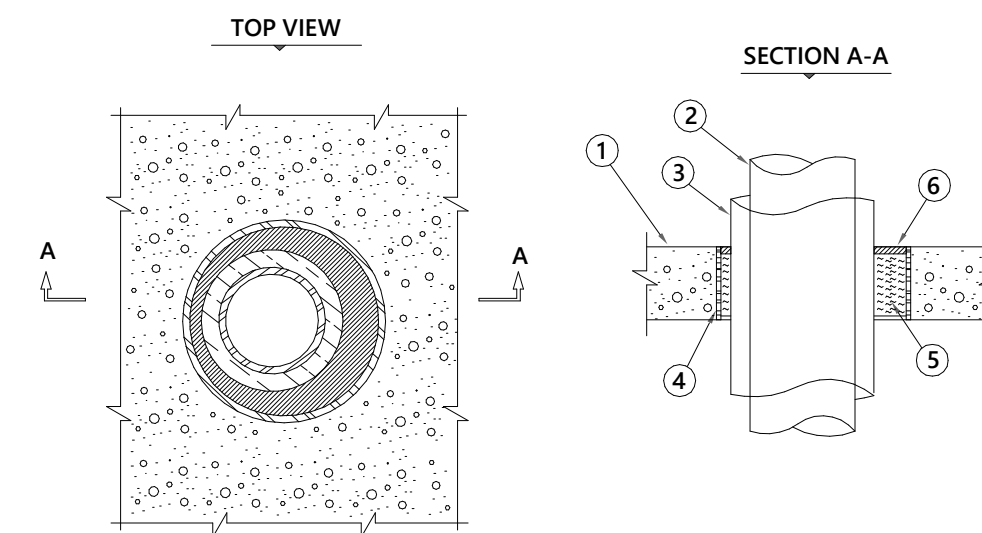
STEP 1 - PREPARATION: to application of firestopping materials. All surfaces must be clean, sound, dry and frost free prior

STEP 2 - BACKING MATERIAL: Firmly pack mineral wool around the penetrating item recessing it 1/2" below surface of the sleeve (or both ends of sleeve in wall)

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to a min. depth of 1/2" flush with the end(s) of the sleeve. Wall penetrations require Firestop Sealant installed on both sides. Leave completed seal undisturbed for 48 hours.

**2 U.L. SYSTEM NO CAJ-1155 DETAIL**  
 NOT TO SCALE

**U.L. SYSTEM NO. CAJ5090**  
**INSULATED METALLIC PIPE THROUGH CONCRETE WALL OR FLOOR**  
 F RATING = 3-HR.  
 T RATING = 0-HR.  
 L RATING AT AMBIENT = 4 CFM/SQ. FT.  
 L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



- CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK)
- PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
  - MAXIMUM 4" DIAMETER STEEL PIPE.
  - MAXIMUM 4" DIAMETER COPPER PIPE.
  - MAXIMUM 4" DIAMETER STEEL CONDUIT.
  - MAXIMUM 4" DIAMETER EMT.
- MAXIMUM 3/4" THICK AB/PVC PIPE INSULATION.
- OPTIONAL: MAXIMUM 8" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).
- MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
- MINIMUM 1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 8-5/8".  
 2. ANNULAR SPACE = MINIMUM 1/2", MAXIMUM 1-1/2".

**INSTALLATION INSTRUCTIONS FOR UL NO. CAJ5090**

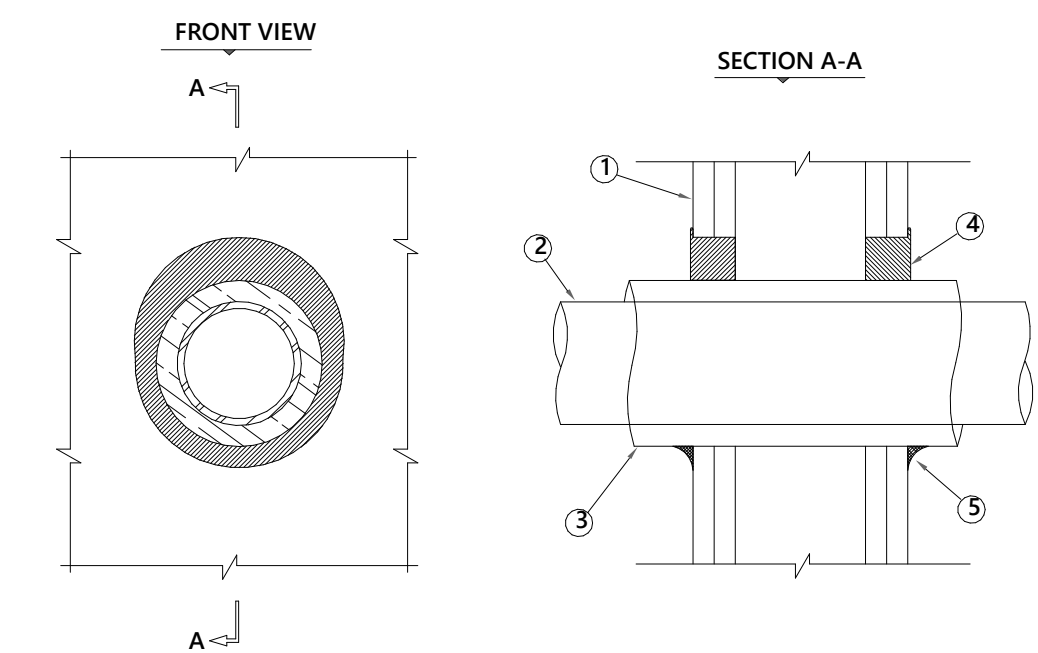
STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

STEP 2 - BACKING MATERIAL: Pack mineral wool tightly around the penetrating item to the depth shown in the drawings, and recess it below the top surface of the floor (or both surfaces of a wall) to allow proper space for the firestop material.

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to the depth shown. Wall penetrations require Firestop Sealant on both sides. Leave completed seal undisturbed for 48 hours.

**3 U.L. SYSTEM NO CAJ5090 DETAIL**  
 NOT TO SCALE

**U.L. SYSTEM NO. WL5028**  
**INSULATED METAL PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY**  
 F RATING = 1-HR AND 2-HR  
 T RATING = 1/2-HR  
 L RATING AT AMBIENT = 4 CFM/SQ. FT.  
 L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



- GYPSUM-WALL ASSEMBLY (1-HR. OR 2-HR. FIRE RATING)(2-HR. SHOWN).
- PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
  - MAXIMUM 4" DIAMETER STEEL PIPE.
  - MAXIMUM 2" DIAMETER COPPER PIPE.
  - MAXIMUM 4" DIAMETER EMT.
  - MAXIMUM 4" DIAMETER STEEL CONDUIT.
- MAXIMUM 3/4" THICK (AB/PVC) FLEXIBLE FOAM TYPE PIPE INSULATION.
- HILTI FS-ONE FIRESTOP SEALANTS:
  - MINIMUM 5/8" DEPTH, FOR A 1-HR. FIRE-RATING.
  - MINIMUM 1-1/4" DEPTH, FOR A 2-HR. FIRE-RATING.
- MINIMUM 1/2" CROWN HILTI FS-ONE FIRESTOP SEALANT AT PIPE INSULATION/WALL ASSEMBLY INTERFACE.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 7-1/2".  
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

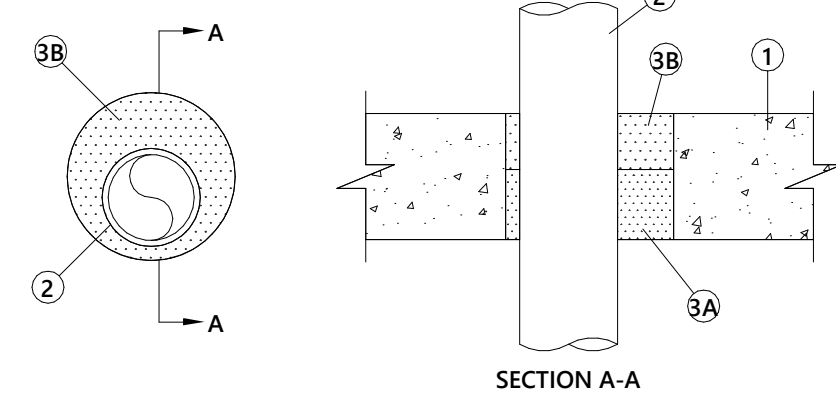
INSTALLATION INSTRUCTIONS FOR UL NO. WL5028  
 STEP 1 - PREPARATION: ALL SURFACES MUST BE CLEAN, SOUND, DRY AND FROST FREE PRIOR TO APPLICATION OF FIRESTOPPING MATERIALS.

STEP 2 - FIRESTOP SEALANT: APPLY A MINIMUM 5/8" OR 1-1/4" DEPTH OF FS-ONE IN THE ANNULAR SPACE BETWEEN THE PIPE AND WALL ON BOTH SIDES AND WITH A PUTTY KNIFE UNTIL FLUSH WITH SURFACE. TOOL EXCESS BEYOND THE PERIMETER OF THE OPENING 1/2" ONTO EACH WALL SURFACE. LEAVE COMPLETED SEAL UNDISTURBED FOR 48 HOURS.

TOOL IT BEYOND THE WALL SURFACE. LEAVE COMPLETED PERIMETER OF THE OPENING 1/2" ONTO EACH SEAL UNDISTURBED FOR 48 HOURS.

**4 U.L. SYSTEM NO WL5028 DETAIL**  
 NOT TO SCALE

**SYSTEM NO. C-AJ-2141**  
**PVC PIPE THROUGH CONCRETE WALL ASSEMBLY**  
 F RATING -- 3 HR  
 T RATING -- 2 HR  
 L RATING AT AMBIENT -- LESS THAN 1 CFM/SQ FT  
 L RATING AT 400 F -- 4 CFM/SQ FT

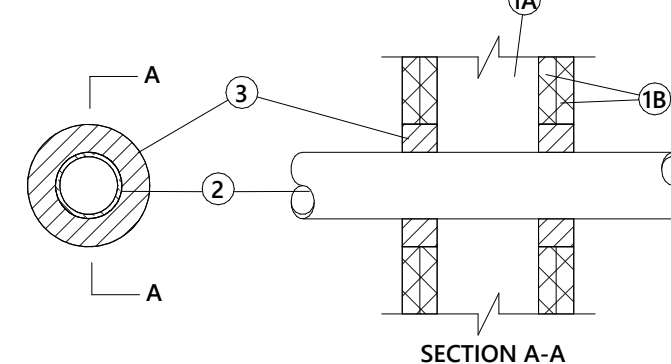


- FLOOR OR WALL ASSEMBLY -- MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY U.L. CLASSIFIED CONCRETE BLOCKS. MAX DIAM OF OPENING IS 6 IN. SEE CONCRETE BLOCKS' (CAZ) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS -- ONE NONMETALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN THE PIPE OR CONDUIT AND THE PERIPHERY OF THE OPENING SHALL BE A MIN 1/2 IN. TO A MAX 2 IN. THE PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL. THE FOLLOWING TYPES AND SIZES OF PIPES OR CONDUITS MAY BE USED:
  - POLYVINYL CHLORIDE (PVC) PIPE -- NOM 3 IN. DIAM (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
  - CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE -- NOM 3 IN. DIAM (OR SMALLER) SDR 17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
- FIRESTOP SYSTEM -- THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
  - FORMING MATERIAL -- MIN 2-1/2 IN. THICKNESS OF FORMING MATERIAL FOAMED INTO OPENING AS A PERMANENT FORM. FORMING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
  - HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CF80, CF82 OR CF511 FOAM SEALANT
  - FILL, VOID OR CAVITY MATERIAL -- SEALANT -- MIN 2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS FLUSH WITH TOP SURFACE OF FLOOR OR WITHIN BOTH SURFACES OF WALL. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-ONE SEALANT

\*BEARING THE UL CLASSIFICATION MARK

**5 PVC PIPE THROUGH CONCRETE WALL ASSEMBLY**  
 NOT TO SCALE

**SYSTEM NO. W-L-2098**  
**PVC PIPE THROUGH GYPSUM WALL ASSEMBLY**  
 F RATINGS - 1 AND 2 HR (SEE ITEM 1)  
 T RATINGS - 1 AND 2 HR (SEE ITEM 1)  
 L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT  
 L RATING AT 400 F - 4 CFM/SQ FT



- 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:
  - 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. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
  - GYPSUM BOARD -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPPED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 4-3/8 IN. THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY WHICH IT IS INSTALLED.
- THROUGH PENETRANTS -- ONE NONMETALLIC PIPE INSTALLED WITHIN THE FIRESTOP SYSTEM. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE SPACE BETWEEN PIPE AND PERIPHERY OF OPENING SHALL BE MIN 3/4 IN. TO MAX 1-1/4 IN. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES MAY BE USED:
  - POLYVINYL CHLORIDE (PVC) PIPE -- NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEM.
  - CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE -- NOM 2 IN. DIAM (OR SMALLER) SDR17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
- FILL, VOID OR CAVITY MATERIALS -- SEALANT -- INSTALLED TO COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE PIPES AND GYPSUM WALLBOARD ON BOTH SIDES OF WALL.

\*BEARING THE UL CLASSIFICATION MARK

**6 PVC PIPE THROUGH GYPSUM WALL ASSEMBLY**  
 NOT TO SCALE