

PLUMBING GENERAL NOTES:

1. CONFORM TO APPLICABLE CODES (LOCAL, STATE, NATIONAL CODES, NFPA, OSHA, ETC.), GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, AND APPLICABLE STANDARDS.
2. CONTRACTOR TO OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED TESTS, INSPECTIONS AND APPROVALS.
3. CONTRACTOR TO FURNISH PLUMBING FIXTURES, EQUIPMENT AND MATERIAL INDICATED AND SHOWN ON DRAWINGS AND INSTALL COMPLETE AND PLACE IN PROPER OPERATION.
4. EXTEND DOMESTIC WATER FROM NEW BUILDING SERVICE LINE AS INDICATED ON DRAWINGS. INSTALL DOMESTIC WATER DISTRIBUTION PIPING TO ALL FIXTURES AND EQUIPMENT REQUIRING SAME. INCLUDE ALL FITTINGS, VALVES, HANGERS, AND OTHER ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION.
5. PROVIDE PLUMBING FIXTURES, DRAINS AND EQUIPMENT WITH THE CODE REQUIRED TRIM, CONTROLS AND ACCESSORIES.
6. INSULATE PIPING PER ASHRAE GUIDELINES AND INTERNATIONAL ENERGY CONSERVATION CODE.
7. SEWERS TO BE PITCHED A MINIMUM OF 1/4" PER FOOT FOR SIZES 3" AND UNDER, AND 1/8" PER FOOT FOR SIZES 4" AND LARGER OR TO GRADES INDICATED ON DRAWINGS.
8. CHANGES IN DIRECTION AND BRANCH CONNECTIONS SHALL BE MADE WITH APPROVED DRAINAGE FITTINGS COMPATIBLE WITH THE PIPING SYSTEM MATERIAL IN WHICH IT IS INSTALLED.
9. FIXTURES AND SANITARY DRAINS SHALL BE VENTED AS INDICATED ON DRAWINGS AND IN ACCORDANCE WITH CODE.
10. THIS PROJECT HAS A RETURN AIR PLENUM AND PVC SHALL NOT BE INSTALLED IN RETURN AIR PLENUMS. USE NO-HUB CAST IRON, DWV, COPPER ASTM B306 PIPING, OR PRESS FIT STAINLESS STEEL PIPING IN PLENUMS.
11. INCLUDE UNIONS, OR OTHER DISCONNECT MEANS, STOPS OR VALVES FOR ISOLATION OF FIXTURES AND EQUIPMENT. VALVES TO BE FULLY COMPATIBLE WITH PIPING FOR SERVICE INTENDED AS MANUFACTURED BY APOLLO, NIBCO, WATTS, KITZ OR OTHER APPROVED MANUFACTURER. INCLUDE HOSE OR DRAIN VALVES AT LOW POINTS WHERE FIXTURES CANNOT BE USED FOR DRAINAGE.
12. HANGERS ON INSULATED PIPE SHALL BE OUTSIDE OF INSULATION, SIZED ACCORDINGLY AND WITH SUFFICIENT SADDLE TO PROTECT INSULATION.
13. FLUSH, VENT AND SANITIZE ALL WATER PIPING WITH EQUIVALENT SOLUTION OF 50 PPM OF AVAILABLE CHLORINE UPON COMPLETION. COMPLY WITH PLUMBING CODE REQUIREMENTS FOR SANITIZATION.
14. COORDINATE FINAL PIPE ROUTING WITH ARCHITECT AND OTHER TRADES.
15. NO WORK SHALL BE INSTALLED UNTIL ALL TRADES HAVE SIGNED OFF ON THE COORDINATION DRAWINGS AND THE COORDINATION DRAWINGS ARE APPROVED BY THE ARCHITECT.
16. NEW SUPPLY BRANCH LINES MAY USE "PRESS TYPE" HEAVY DUTY HIGH COMPRESSION COPPER FITTINGS AND COUPLINGS WITH O-RING SEALS OR TRADITIONAL LEAD-FREE SOLDER JOINTS AND FITTINGS. TEE-DRILL FITTINGS WITH BRAZED JOINTS ARE PERMITTED AT THE SUPPLY MANIFOLDS BEHIND BANKS OF PLUMBING FIXTURES.
17. ALL HOT AND COLD WATER SUPPLY PIPING SHALL BE INSULATED WITH 1" FIBERGLASS INSULATION WITH ALL SERVICE JACKET.

PLUMBING LEGEND					
SYMBOL	ABRV.	DESCRIPTION	SYMBOL	ABRV.	DESCRIPTION
— EX (X) —	EX	EXISTING PIPING TO REMAIN - (X) DESIGNATES SERVICE			CONNECTION POINT, NEW TO EXISTING
— RX (X) —	RX	EXISTING PIPING TO BE REMOVED - (X) DESIGNATES SERVICE			DISCONNECTION POINT
— — — — —		PIPING ROUTED BELOW GRADE / SLAB (LINE TYPE INDICATES SERVICE TYPE UNO)			DRAWING KEYNOTE
— SAN —	SAN	SANITARY PIPING			DEMOLITION DRAWING KEYNOTE
— GW —	GW	GREASE WASTE PIPING (TO GREASE INTERCEPTOR)			REVISION NUMBER
— OW —	OW	OIL WASTE PIPING			REVISION CLOUD
— ST —	ST	STORM PIPING (PRIMARY)			PIPE UP
— OST —	OST	SECONDARY / OVERFLOW DRAIN PIPING			PIPE DOWN
— V —	V	VENT PIPING			PIPE TEE DOWN
— CW —	CW	DOMESTIC COLD WATER PIPING			TOP PIPE CONNECTION
— HW —	HW	DOMESTIC HOT WATER PIPING			BALL VALVE OR SHUTOFF VALVE IN RISE
— HWR —	HWR	DOMESTIC HOT WATER RETURN PIPING			PIPE CAP
— DIS —	DIS	DEIONIZED WATER SUPPLY PIPING			PIPE UNION
— DIR —	DIR	DEIONIZED WATER RETURN PIPING			FLANGED CONNECTION
— TP —	TP	TRAP PRIMER PIPING			CONCENTRIC PIPE REDUCER
— G —	G	GAS PIPING (NATURAL OR PROPANE)			ECCENTRIC PIPE REDUCER
— FO —	FO	FUEL OIL PIPING			FLOW ARROW
— CD —	CD	CONDENSATE DRAIN PIPING			PIPE ANCHOR
— PD —	PD	PUMP DISCHARGE			PIPE GUIDE
— MV —	MV	MEDICAL VACUUM PIPING		BV	BALL VALVE
— MA —	MA	MEDICAL AIR PIPING		BFV	BUTTERFLY VALVE
— LV —	LV	LABORATORY VACUUM PIPING		PV	PLUG VALVE
— LA —	LA	LABORATORY AIR PIPING		GV	GATE VALVE
— PV —	PV	PROCESS AIR VACUUM PIPING		GBV	GLOBE VALVE
— PA —	PA	PROCESS AIR PIPING		PRV	PRESSURE REDUCING VALVE
— OXY —	OXY	OXYGEN PIPING		CV	CHECK VALVE
— HEX —	HEX	HELIX PIPING		BFP	BACK FLOW PREVENTER
— N —	N	NITROGEN PIPING			PRESSURE RELIEF VALVE
— CA —	CA	COMPRESSED AIR PIPING			AUTOMATIC FLOW CONTROL VALVE
— AV —	AV	ACID VENT PIPING			CALIBRATED BALANCING VALVE
— AW —	AW	ACID WASTE PIPING			AUTOMATIC AIR VENT
— CO2 —	CO2	CARBON DIOXIDE PIPING			MANUAL AIR VENT
— MAI —	MAI	MEDICAL AIR INTAKE PIPING			P/T PLUG
— MVD —	MVD	MEDICAL VACUUM DISCHARGE PIPING		PG	PRESSURE GAUGE W/ SHUT-OFF
— NO —	NO	NITROUS OXIDE PIPING			THERMOMETER
— WAGD —	WAGD	WASTE ANESTHETIC GAS DISCHARGE			STRAINER
		MEDICAL GAS OUTLET (LETTER DESIGNATES GAS TYPE)		T&P	TEMPERATURE AND PRESSURE RELIEF VALVE
		UTILITY METER		MV	MIXING VALVE
		HOT WATER RECIRC. PUMP			EXTERNAL WALL HYDRANT
		DOMESTIC SHOCK ABSORBER/WATER HAMMER ARRESTER, TEXT DENOTES SIZE (PDI: A - F)		FCO	CLEAN OUT, FLOOR
		GAS SOLENOID VALVE		CO	CLEAN OUT, EXPOSED
		GAS COCK		FD	FLOOR DRAIN
		AQUASTAT		RD	ROOF DRAIN
		VACUUM RELIEF VALVE			PIPE TRAP
	VB	VACUUM BREAKER			FLOOR DRAIN WITH TRAP PRIMER
		HOSE BIBB			FLOOR SINK/RECEPTOR WITH HALF GRATE
		FLEXIBLE PIPE CONNECTION		OS&Y	OS&Y VALVE
		INVERT ELEVATION B.F.F. (IN FEET)		TS	OS&Y VALVE WITH TAMPER SWITCH
		KITCHEN EQUIPMENT DESIGNATION; REFER TO KITCHEN EQUIPMENT DRAWINGS FOR DETAILS	NOTES: 1. NOT ALL SYMBOLS AND ABBREVIATIONS ARE IN USE FOR THIS PROJECT.		

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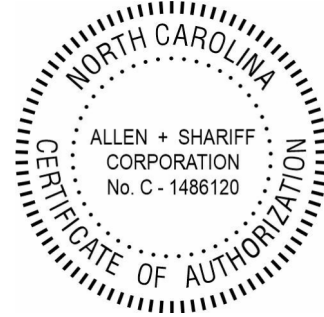
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Key Plan

PLUMBING DATA SHEET

P001-B



PLUMBING SPECIFICATIONS	
PLUMBING GENERAL CONDITIONS (220100)	
1. GENERAL	
a. CONFORM TO ALL GENERAL AND SPECIAL CONDITIONS OF CONTRACT AS SPECIFIED BY ARCHITECT AND/OR OWNER.	
b. PRODUCTS AND INSTALLATION SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES, GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, ETC. OF ALL AUTHORITIES HAVING JURISDICTION. WORK SHALL COMPLY WITH THE FOLLOWING CODES, STANDARDS AND ORGANIZATIONS:	
1. NORTH CAROLINA MECHANICAL CODE	
2. NORTH CAROLINA PLUMBING CODE	
3. NORTH CAROLINA ENERGY CODE	
4. NATIONAL ELECTRIC CODE	
5. NFPA	
6. UNDERWRITERS LABORATORY (UL), IRI, FM	
7. SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" GUIDELINES, DETAILS, & MODEL SPECIFICATION.	
c. WHERE CONFLICTS EXIST BETWEEN CODES, STANDARDS OR THIS SPECIFICATION THE HIGHER REQUIREMENT SHALL APPLY. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS. CONFIRM ALL UTILITY COMPANY REQUIREMENTS AND CONNECTION POINTS IN FIELD, PRIOR TO STARTING WORK.	
d. ALL SPECIFICATIONS AND DRAWINGS, I.E., ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL ARE COMPLEMENTARY AND MUST BE USED IN COMBINATION TO OBTAIN COMPLETE CONSTRUCTION INFORMATION. ANY INFORMATION CONFLICTS WITHIN THE SPECIFICATIONS AND DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. DRAWINGS ARE DIAGRAMMATIC. CONFIRM ALL DIMENSIONS BY FIELD MEASUREMENT. THE EXACT LOCATIONS FOR APPARATUS, FIXTURES, EQUIPMENT AND PIPING WHICH IS NOT COVERED BY DRAWINGS, SHALL BE OBTAINED FROM THE ARCHITECT OR HIS REPRESENTATIVE IN THE FIELD, AND THE WORK SHALL BE LAID OUT ACCORDINGLY.	
e. EACH CONTRACTOR SHALL PROVIDE FOR HIS OWN CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF ALL RUBBISH DAILY. CONTRACTOR SHALL PROTECT THEIR WORK AND EXISTING OR ADJACENT PROPERTY AGAINST WEATHER. TO MAINTAIN THEIR WORK, MATERIALS, APPARATUS AND FIXTURES FREE FROM INJURY OR DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW WORK AT THE CONTRACTOR'S EXPENSE.	
f. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, SEQUENCES OF CONSTRUCTION AND THE SAFETY OF WORKERS.	
g. NO MEP, IT, FP SYSTEMS OR COMPONENTS SHALL BE INSTALLED OR ROUTED ABOVE ELECTRICAL PANELS AND EQUIPMENT OR THROUGH ELEVATOR ROOMS, FIRE PUMP ROOMS, OR STAIR TOWERS UNLESS SERVING THE MACHINE ROOM, FIRE PUMP ROOM OR STAIR TOWER.	
h. THE CONTRACTOR SHALL COORDINATE AND OBTAIN A WRITTEN LISTING OF ELECTRICAL CHARACTERISTICS OF ALL MECHANICAL EQUIPMENT FROM THE ELECTRICAL CONTRACTOR PRIOR TO THE ORDERING OF EQUIPMENT. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.	
i. IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE ENGINEER. NO CHANGES ARE TO BE MADE TO THE WORK OF THIS CONTRACT WITHOUT PRIOR KNOWLEDGE AND APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL HOLD THE OWNER AND ITS CONSULTANTS HARMLESS AGAINST ALL CLAIMS AND JUDGMENTS ARISING OUT OF THE CONTRACTOR'S PERFORMANCE OF THE WORK OF THIS CONTRACT. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK, WHICH HE EXPECTS ADDITIONAL COMPENSATION BEYOND THE CONTRACT AMOUNT, WITHOUT WRITTEN AUTHORIZATION FROM THE APPROPRIATE AUTHORITY. FAILURE TO OBTAIN SUCH AUTHORIZATION SHALL INVALIDATE ANY CLAIM FOR EXTRA COMPENSATION.	
j. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO INSTALL THE HEATING, VENTILATION AND AIR CONDITIONING SYSTEM SO AS TO INSURE QUIET OPERATION, NO VIBRATION OR SOUND SHALL BE TRANSMITTED TO THE BUILDING, STRUCTURE OR OCCUPIED AREAS. THE DECISION OF THE ENGINEER AS TO THE QUIETNESS OF THE SYSTEM AND EQUIPMENT SHALL BE FINAL. IT SHALL BE THIS CONTRACTORS' RESPONSIBILITY TO CORRECT OR REPLACE ANY NOISY SYSTEM OR EQUIPMENT AS REQUIRED.	
k. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS.	
1. BASIS OF DESIGN AND SUBSTITUTIONS (012300)	
a. WHEREVER THE WORDS "APPROVED BY," "APPROVED EQUAL," "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THE SPECIFICATION (WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD".	
2. SUBMITTAL PROCEDURES (013300)	
a. SUBMIT SHOP DRAWINGS FOR MECHANICAL EQUIPMENT, FIRE PROTECTION SYSTEMS, DUCTWORK, AND PLUMBING FIXTURES AND EQUIPMENT WITH ADEQUATE DETAILS AND SCALES TO CLEARLY SHOW CONSTRUCTION. INDICATE THE OPERATING CHARACTERISTICS FOR EACH REQUIRED ITEM. CLEARLY IDENTIFY EACH ITEM ON THE SUBMITTAL AS TO MARK, LOCATION AND USE, USING SAME IDENTIFICATION AS PROVIDED ON DESIGN DRAWINGS. SHOP DRAWINGS TO BE SUBMITTED INCLUDE BUT NOT LIMITED TO:	
FIXTURES	
VALVES & PIPING	
ALL EQUIPMENT	
a. CONTRACTOR SHALL REVIEW AND INDICATE HIS APPROVAL OF EACH SHOP DRAWING PRIOR TO SUBMITTAL FOR REVIEW. DO NOT START WORK OR FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER AND RETURNED TO THE CONTRACTOR.	
b. SUBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND NOT FOR DIMENSIONS OR QUANTITIES. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PURCHASE OF ANY ITEM IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS OR ITS COMPLETE AND PROPER INSTALLATION.	
c. WHERE SUBMITTALS VARY FROM THE CONTRACT REQUIREMENTS, THE CONTRACTOR SHALL CLEARLY INDICATE THE NATURE AND REASON FOR VARIATIONS ON SUBMITTAL OR ACCOMPANYING DOCUMENTS.	
d. EACH MANUFACTURER OR HIS REPRESENTATIVE MUST CHECK THE APPLICATION OF HIS EQUIPMENT AND CERTIFY AT TIME OF SHOP DRAWING SUBMITTAL THAT EQUIPMENT HAS BEEN PROPERLY APPLIED AND CAN BE INSTALLED, SERVICED AND MAINTAINED WHERE INDICATED ON DRAWINGS. ADVISE ENGINEER IN WRITING WITH SUBMITTAL DRAWINGS OF ANY POTENTIAL PROBLEMS. THE MANUFACTURER SHALL BE RESPONSIBLE FOR ANY CHANGES THAT MIGHT BE NECESSARY BECAUSE OF PHYSICAL CHARACTERISTICS OF EQUIPMENT THAT HAVE NOT BEEN CALLED TO THE ENGINEER'S ATTENTION AT THE TIME OF SUBMITTAL.	
3. CUTTING, PATCHING AND DRILLING (017329)	
a. ALL CUTTING AND PATCHING OF THE BUILDING CONSTRUCTION REQUIRED FOR THIS WORK SHALL BE BY THIS CONTRACTOR UNLESS SHOWN ON ARCHITECTURAL DRAWINGS AND CONFIRMED AS TO SIZE AND LOCATION PRIOR TO NEW CONSTRUCTION. CUTTING SHALL BE IN A NEAT AND WORKMANLIKE MANNER. NEATLY SAW CUT ALL RECTANGULAR OPENINGS, SET SLEEVE THROUGH OPENING, AND FINISH PATCH OR PROVIDE TRIM FLANGE AROUND OPENING. CORE DRILL AND SLEEVE ALL ROUND OPENINGS. DO NOT CUT ANY STRUCTURAL COMPONENTS WITHOUT THE ARCHITECT'S APPROVAL.	
b. PATCH AND FINISH TO MATCH ADJACENT AREAS THAT HAVE BEEN CUT, DAMAGED OR MODIFIED AS A RESULT OF THE INSTALLATION OF MECHANICAL OR ELECTRICAL EQUIPMENT. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER.	
c. ALL CONTRACTORS SHALL CONFIRM WITH OWNER, PRIOR TO BID, TIMES AVAILABLE FOR NOISE PRODUCING WORK SUCH AS CUTTING AND CORE DRILLING OF FLOORS, WALLS, ETC., AS WELL AS TIMES FOR WORK WHICH REQUIRE ACCESS INTO ADJOINING TENANT SPACES. INCLUDE ANY PREMIUM TIME IN BID.	
d. THE EXACT LOCATION OF ROOFTOP EQUIPMENT SHALL BE APPROVED BY OWNER'S STRUCTURAL ENGINEER.	
e. INFORMATION REGARDING REQUIRED PIPE OPENINGS IN WALLS, FLOORS, CHASES, ETC., AND CONCRETE EQUIPMENT PADS OR FOUNDATIONS SHALL BE GIVEN TO THE GENERAL CONTRACTOR BY THIS CONTRACTOR PRIOR TO THE CONSTRUCTION PERIOD. IF THIS CONTRACTOR FAILS TO COMPLY WITH THIS REQUEST, OR IF INCORRECT INFORMATION IS GIVEN, THE NECESSARY CUTTING AND PATCHING WILL BE PERFORMED BY THE GENERAL CONTRACTOR, AT THIS CONTRACTOR'S EXPENSE.	
4. FIRESTOPPING (017329)	
a. ALL SERVICES THAT PASS THRU FIRE OR SMOKE RATED PARTITIONS, WALLS, FLOORS, SHALL BE FIRESTOPPED. FIRE STOPPING RATING SHALL MATCH PARTITION RATING. ALL FIRE STOPPING SYSTEM SHALL MEET THE REQUIREMENTS OF ASTM E 814,UL 1479, AND BE FACTORY MUTUAL APPROVED.	
b. ALL FIRESTOPPING AND/OR SMOKE STOPPING MATERIAL AND INSTALLATION SHALL BE AS MANUFACTURED BY HILTI OR APPROVED EQUAL.	
5. ACCESS DOORS & PANELS (083113)	
a. ACCESS DOORS SHALL BE PROVIDED IN WALLS AND CEILINGS WHERE REQUIRED TO PERMIT PROPER ACCESS TO VALVES AND ANY OTHER SUCH DEVICES WHICH REQUIRE MAINTENANCE OR SERVICE. DOORS PLACED IN WALLS, PARTITIONS OR OTHER FIRE-RATED CONSTRUCTION SHALL HAVE A LABEL SIGNIFYING THAT THE DOOR HAS THE SAME FIRE RATING AS THE FIRE-RATED CONSTRUCTION.	
b. THIS CONTRACTOR SHALL FURNISH ACCESS PANELS TO THE GENERAL CONTRACTOR FOR INSTALLATION.	
c. ACCESS PANELS SHALL BE CONSTRUCTED OF 14 GAUGE STEEL, WITH 16 GAUGE STEEL FRAMES. DOORS SHALL FINISH FLUSH WITH THE SURROUNDING SURFACE.	
d. RAMES SHALL HAVE 3-INCH-WIDE EXPANDED METAL FOR PLASTERED SURFACES AND PLAIN FLANGED TYPE FRAME FOR TILE, MASONRY OR GYPSUM BOARD SURFACES. DOORS AND FRAMES SHALL BE FURNISHED PRIME COATED. DOORS INSTALLED IN CERAMIC TILE OR OTHER NON-PAINTED SURFACES SHALL BE STAINLESS STEEL. HINGES SHALL BE CONCEALED SPRING TYPE, TO ALLOW DOORS TO BE OPENED 175 DEGREES. LOCKS SHALL BE FLUSH SCREWDRIVER TYPE WITH STEEL CAMS. ACCESS PANELS SHALL BE 16 INCHES OR LARGER AS MAY BE REQUIRED FOR PROPER ACCESS TO THE DEVICE BEING SERVED.	
e. ACCESS PANELS ARE NOT REQUIRED IN COMPLETELY ACCESSIBLE LIFT-OUT-TILE CEILINGS. CONTRACTOR SHALL REVIEW THE ROOM FINISH SCHEDULE ON THE ARCHITECTURAL DRAWINGS IN ORDER TO VERIFY THE NEED FOR ACCESS PANEL.	
6. PAINTING (099113 AND 099123)	
a. IN FINISHED SPACES, PAINTING OF ALL MECHANICAL EQUIPMENT, APPARATUS, AND PIPING SHALL BE DONE BY THE PAINTING TRADE UNDER THE GENERAL CONTRACTOR SPECIFICATION, EXCEPT WHERE SPECIFIED TO BE DONE BY THE MECHANICAL CONTRACTOR.	
7. RECORD DRAWINGS (017839)	
a. EACH CONTRACTOR OR SUBCONTRACTOR SHALL KEEP ONE (1) COMPLETE SET OF THE CONTRACT WORKING DRAWINGS ON THE JOB SITE ON WHICH HE SHALL REGULARLY RECORD ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION.	
b. THESE DRAWINGS SHALL RECORD THE LOCATION OF ALL CONCEALED EQUIPMENT, PIPING, ELECTRIC SERVICE, SEWERS, WASTES, VENTS, DUCTS, CONDUIT AND OTHER PIPING, BY MEASURED DIMENSIONS TO EACH SUCH ITEM FROM READILY IDENTIFIABLE AND ACCESSIBLE WALLS OR CORNERS OF THE BUILDING. PLANS ALSO SHALL SHOW INVERT ELEVATION OF SEWERS AND TOP ELEVATION OF ALL OTHER BELOW-GRADE LINES.	
c. RECORD DRAWINGS SHALL BE KEPT CLEAN AND UNDAMAGED AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN RECORDING DEVIATIONS FROM WORKING DRAWINGS AND EXACT LOCATIONS OF CONCEALED WORK.	
d. AFTER THE PROJECT IS COMPLETED, THESE SETS OF DRAWINGS SHALL BE DELIVERED TO THE ARCHITECT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS ACTUALLY CONSTRUCTED.	
8. WARRANTY (017700)	
a. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE. EXTEND ALL MANUFACTURER'S WARRANTIES TO THE OWNER.	
b. REPAIR OR REPLACE WITHOUT CHARGE TO THE OWNER ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIOD. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE EXTENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.	
PIPING SYSTEMS (220000)	
1. CONNECTIONS BETWEEN DISSIMILAR PIPING MATERIALS SHALL BE MADE WITH SUITABLE DIELECTRIC INSULATING FITTINGS. ISOLATE COPPER PIPING FROM DISSIMILAR METALS, SUCH AS METAL STUDS AND VENT PIPING.	
2. ALL PIPING SHALL RUN CONCEALED ABOVE CEILING OR IN WALL CHASE, UNLESS OTHERWISE NOTED. EXPOSED PIPING SHALL BE 3/4 INCH MINIMUM FROM ANY WALL SURFACE, EXCEPT WHERE OTHERWISE INDICATED ON THE DRAWINGS. PIPING IS SHOWN ON THE FLOOR WHERE IT ACTUALLY OCCURS IN THE BUILDING.	
SANITARY AND STORM SEWERS	
1. PROVIDE SANITARY AND STORM SEWERS, RAIN CONDUCTORS, STACKS, VENTS, FLOOR DRAINS, HUBS FOR DOWN SPOUTS AND CLEANOUTS FOR PROJECT AND EXTEND TO EXISTING BUILDING FACILITIES AS INDICATED ON THE DRAWINGS.	
2. EXCEPT WHERE OTHERWISE INDICATED, HORIZONTAL SANITARY, SEWAGE AND WASTE PIPING SHALL SLOPE AT 1/4 INCH PER FOOT FOR PIPES 2 INCHES AND SMALLER, PIPES 3 INCHES AND LARGER SHALL SLOPE AT 1/8 INCH PER FOOT. ALL VERTICAL SANITARY SEWER AND STORM WATER PIPING, WHICH TURN 90° AFTER PASSING THROUGH A FLOOR, SHALL BE INSTALLED AS TIGHT AS POSSIBLE TO THE UNDERSIDE OF THE STRUCTURE.	
3. CHANGES IN DIRECTION AND BRANCH CONNECTIONS SHALL BE MADE WITH CODE APPROVED DRAINAGE FITTINGS COMPATIBLE WITH THE PIPING SYSTEM MATERIAL. CLEAN-OUTS SHALL BE PROVIDED IN PIPING AT EACH CHANGE IN DIRECTION, IN ALL HORIZONTAL STRAIGHT RUNS MORE THAN 50 FEET LONG OR AS ALLOWED BY CODE, AND AT ALL OTHER LOCATIONS AS NOTED ON THE DRAWINGS. ALL CLEAN-OUTS SHALL BE THE SAME SIZE AS THE PIPE DIAMETER UP TO AND INCLUDING PIPE 4 INCHES IN DIAMETER. FOUR INCH CLEAN-OUTS SHALL BE USED FOR ALL PIPE LARGER THAN 4 INCHES, UNLESS NOTED OTHERWISE. ALL CLEAN-OUT LOCATIONS SHALL BE NO MORE THAN 5 FEET ABOVE THE BASE OF THE HORIZONTAL OFFSET AND BE APPROVED BY THE ARCHITECT. FOR CARPETED AREAS, PROVIDE A PERMANENT IDENTIFYING MARK IN THE CARPET DIRECTLY ABOVE THE CLEAN-OUT. THE CLEAN-OUT SHALL HAVE A SMOOTH POLISHED BRONZE FINISH WITH THE LETTERS "C.O." CAST IN THE COVER. FOR WALLS, PROVIDE AN ACCESS PANEL WITH CLEARANCE FOR ROODING. THE FLOOR CLEAN-OUTS SHALL BE ZURN MODEL ZN-1400-T OR APPROVED EQUAL WITH BRONZE PLUG, SQUARE NICKEL BRONZE FRAME AND COVER. THE WALL CLEAN-OUTS SHALL BE ZURN MODEL ZN-1443-BP OR APPROVED EQUAL WITH BRONZE PLUG AND 7 INCHES X 7 INCHES NICKEL BRONZE COVER. NO SANITARY, SOIL OR WASTE PIPE SHALL EXTEND GREATER THAN 2'-0" TO A DEAD-END.	
4. PROVIDE ONE TRAP PRIMER VALVE FOR EACH FLOOR DRAIN WITHOUT A CONSTANT SOURCE OF WATER SUPPLY TO MAINTAIN TRAP SEAL. PRIMER VALVE SHALL BE LOCATED IN AN ACCESSIBLE AREA AND CONNECTED TO THE NEAREST 3/4 INCH COLD WATER LINE SERVING A FIXTURE. TRAP PRIMER VALVE SHALL CONFORM TO ASSE 1018 AND 1044. BARRIER TYPE TRAP SEAL PROTECTION DEVICES COMPLYING WITH ASSE 1072 MAY BE USED IN LIEU OF TRAP PRIMER VALVES AS ALLOWED BY LOCAL CODE AND AHJ. PROVIDE FLOAT TYPE BACKWATER VALVE (SIZED FOR ANTICIPATED FLOW RATE) IN ALL OPEN SITE DRAINS AND FLOOR RECEPTORS RECEIVING A/C UNIT CONDENSATE, AND/OR CLEAR WATER WASTE, SUCH AS SPRINKLER FLOW TESTING.	
5. FIXTURES AND SANITARY DRAINS SHALL BE VENTED AS INDICATED ON DRAWINGS AND IN ACCORDANCE WITH CODE. VENTS ARE TO BE EXTENDED THROUGH ROOF AS INDICATED ON DRAWING AND FLASHED BY OWNER APPROVED ROOFING CONTRACTOR.	
6. PVC PIPING:	
a. THIS PROJECT HAS A RETURN AIR PLENUM AND PVC SHALL NOT BE INSTALLED IN RETURN AIR PLENUMS, USE NO-HUB CAST IRON, DWV COPPER ASTM B306 PIPING, OR PRESS FIT STAINLESS STEEL.	
b. WHERE PVC PIPING IS USED, PROVIDE CODE APPROVED FIRE STOPPING MATERIAL AT FIRE RATED WALL PENETRATIONS.	
7. SEWER AND VENT MATERIAL SHALL BE AS FOLLOWS:	
a. BELOW GRADE STORM AND SANITARY INSIDE BUILDING	
— SERVICE WEIGHT - CAST IRON PIPE ASTM A-74-82 WITH ASTM C-564-70 NEOPRENE COMPRESSION JOINTS. CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.	
— NO-HUB COUPLINGS	
— HEAVY-DUTY, 4 BAND, SHIELDED FOR 4" AND SMALLER.	
— PVC-DWV PLASTIC ASTM D-1785 WITH ASTM D-2665 DWV SOLVENT WELD SOCKET FITTINGS.	
b. ABOVE GRADE RAIN CONDUCTORS, VENTS AND SANITARY -	
— NO-HUB CAST IRON PIPE CISPI 1-301-78. CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.	
— NO-HUB COUPLINGS	
— HEAVY-DUTY, 4 BAND, SHIELDED FOR 4" AND SMALLER.	
— PVC-DWV PLASTIC ASTM D-1785 WITH ASTM D-2665 DWV SOLVENT WELD SOCKET FITTINGS. NOT FOR USE IN RETURN AIR PLENUM.	
— DWV COPPER ASTM B306.	
— FOR HIGH RISE TENANT SPACE: PIPING 2 INCH AND SMALLER SHALL BE DWV GRADE COPPER.	
— STAINLESS STEEL	
c. SITE STORM AND SANITARY SEWERS	
— UP TO 15" - PVC PLASTIC ASTM D-3034 SDR 35 WITH ASTM D-3212 GASKET JOINTS.	
— 18" AND OVER - REINFORCED CONCRETE PIPE (RCP) ASTM C 76-83 WITH ASTM C 443-79 RUBBER GASKET JOINTS.	
DOMESTIC WATER PIPING (221116)	
1. POTABLE WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 14, NSF 372, AND NSF 61 ANNEX G. PLASTIC PIPING COMPONENTS SHALL BE MARKED WITH "NSF-PW." GASKETS, JOINTS, CONNECTORS, SPECIALTIES, AND PIPE SHALL BE MANUFACTURED AND PROVIDED BY THE SAME MANUFACTURER. ALL PIPING SHALL BE SUPPORTED DIRECTLY ON EACH SIDE OF A JOINT. ALL PIPING SUPPORTS AND RESTRAINTS SHALL BE IN STRICT ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION GUIDELINES.	
2. PROVIDE VALVES AND UNIONS WHERE NEEDED TO PERMIT DISCONNECTIONS OF EACH PIECE OF EQUIPMENT FOR REPAIRS. MAKE CONNECTIONS TO EQUIPMENT WITH SHUT-OFF VALVES ON SUPPLY AND BALANCE VALVES ON RETURNS. INSTALL UNIONS IN PIPES 2" AND SMALLER, ADJACENT TO EACH VALVE, AT FINAL CONNECTIONS EACH PIECE OF EQUIPMENT AND ELSEWHERE AS INDICATED. UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.	
3. LEVER TYPE HANDLE OPERATORS SHALL BE PROVIDED ON VALVES UP TO 4". GEAR OPERATORS SHALL BE PROVIDED ON VALVES OVER 4", AND ON VALVES REQUIRING CHAIN OPERATION. VALVES USED FOR BALANCING SHALL HAVE INFINITE POSITION LEVER OR GEAR OPERATORS WITH ADJUSTABLE, OPEN POSITION "MEMORY" STOP. PROVIDE 2" EXTENSION NECKS ON ALL VALVES INSTALLED IN INSULATED LINES.	
4. DOMESTIC WATER PRESSURE REDUCING VALVE ASSEMBLIES SHALL BE SELECTED TO PROVIDE STABLE FLOW CONDITIONS WITHOUT CAVITATION OR VALVE CHATTER.	
5. PROVIDE STOP VALVES AT ALL FIXTURE AND EQUIPMENT SUPPLIES. ALL EXPOSED FIXTURE CONNECTIONS SHALL BE CHROME PLATED, STAINLESS STEEL OR FITTED WITH CHROME PLATED SLEEVES. PROVIDE VACUUM BREAKERS WHERE REQUIRED BY CODE INCLUDE UNIONS, OR OTHER DISCONNECT MEANS, STOPS OR VALVES FOR ISOLATION OF FIXTURES AND EQUIPMENT. VALVES SHALL FULLY BE COMPATIBLE WITH PIPING FOR SERVICE INTENDED. AS MANUFACTURED BY APOLLO, NIBCO, CRANE, OR OTHER APPROVED MANUFACTURER. INCLUDE HOSE OR DRAIN VALVES AT LOW POINTS WHERE FIXTURES CANNOT BE USED FOR DRAINAGE.	
6. WATER PIPING ABOVE GRADE SHALL BE -	
a. TYPE "L" HARD COPPER ASTM B 88-832 WITH WROUGHT COPPER FITTINGS ASTM B 16.22 1980 AND NON-LEAD OR ANTIMONY SOLDER JOINTS.	
b. TYPE "L" HARD COPPER ASTM B 88-832 WITH WROUGHT COPPER FITTINGS ASTM B 16.22 1980 AND PRESS-FIT JOINTS.	
c. PEX TUBING TYPE "A" (CROSS-LINKED POLYETHYLENE) MEETING SECTION 6.6 OF ASTM F876 AND USING "PROPEX" FITTINGS MEETING ASTM F1980, CSA B137.5, NSF/ANSI 14, AND NSF/ANSI 61.	
d. CPVC (CHLORINATED POLYVINYL CHLORIDE) - COPPER TUBE SIZE, (CTS.); ASTM D2846, ASTM F441, ASTM 442, CSA B137.6. FITTINGS SHALL COMPLY WITH ASTM D2846, ASTM F437, ASTM 438, ASTM F439, CSA B137.8, ASSE 1061.	
e. 2"Ø AND SMALLER, COPPER PIPE FITTINGS MAY BE PRESS-CONNECT. CAST-BRONZE OR WROUGHT-COPPER FITTING WITH EPDM-RUBBER, O-RING SEAL IN EACH END. PRESS-CONNECT FITTINGS SHALL CONFORM TO ASME B16.51 STANDARD.	
7. WATER PIPING BELOW GRADE SHALL BE TYPE "K" SOFT COPPER WITHOUT JOINTS.	
8. ALL COLD WATER, HOT WATER, AND HOT WATER RETURN PIPING THAT IS PART OF A NEW SYSTEM OR AN ADDITION OF AN EXISTING SYSTEM SHALL BE THOROUGHLY CLEANED AND DISINFECTED AS PER AWWA C651 OR AWWA C652 GUIDELINES. THE DISINFECTION PROCESS SHALL BE PERFORMED AFTER ALL PIPES, COMPONENTS, VALVES, AND FIXTURES ARE INSTALLED AND THE REQUIRED LEAK/PRESSURE TESTS HAVE BEEN COMPLETED. THE SYSTEM SHALL BE FLUSHED WITH CLEAN, POTABLE WATER UNTIL THE SYSTEM IS COMPLETELY CLEAR OF ALL DIRT, SEDIMENT, AND DEBRIS. THE SYSTEM SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION AS PER CODE AND SHALL BE VALVED OFF FROM THE MAIN WATER SUPPLY AND ALLOWED TO STAND FOR A MINIMUM OF 24 HOURS. AFTER THE REQUIRED STANDING TIME, THE SYSTEM SHALL BE FLUSHED WITH CLEAN POTABLE WATER UNTIL THE DISINFECTANT SOLUTION IS COMPLETELY PURGED FROM THE SYSTEM, FIXTURES, AND COMPONENTS. REPEAT DISINFECTION PROCEDURE AS NEEDED IF BACTERIOLOGICAL EXAMINATION INDICATES THAT CONTAMINANTS ARE STILL PRESENT IN THE SYSTEM. CONTRACTOR SHALL PROVIDE THE FINAL STERILIZATION TESTING REPORT TO THE ENGINEER FOR REVIEW. DOMESTIC HOT AND COLD WATER PIPING UNDER CONCRETE FLOOR TO BE COVERED WITH SAND SO THAT PIPING WILL NOT BECOME EMBEDDED IN THE CONCRETE.	
9. IF CONTRACTOR CHOOSES PRESS-CONNECT OPTION: AFTER PRESS-CONNECT FITTINGS HAVE BEEN INSTALLED A "TWO STEP TEST" SHALL BE FOLLOWED. PRESSURIZE THE SYSTEM WITH APPLICATION APPROPRIATE TEST MEDIUM, WATER BETWEEN 15 AND 85 PSI, OR AIR/DRY NITROGEN BETWEEN 5 AND 45 PSI. CHECK THE PRESSURE GAUGE FOR PRESSURE LOSS. IF THE SYSTEM DOES NOT HOLD PRESSURE, WALK THE SYSTEM AND CHECK FOR UN-PRESSED FITTINGS. SHOULD ANY UNPRESSED FITTINGS BE IDENTIFIED FOLLOWING TEST, ENSURE THE TUBE IS FULLY INSERTED INTO THE FITTING AND PROPERLY MARKED PRIOR TO PRESSING THE JOINT. AFTER APPROPRIATE REPAIRS HAVE BEEN MADE, RETEST THE SYSTEM PER LOCAL CODE AND SPECIFICATION REQUIREMENTS, NOT TO EXCEED 600 PSI WITH WATER OR, 200 PSI WHEN USING AIR.	
10. PIPING UNDER CONCRETE FLOOR SHALL BE TYPE "K" SOFT COPPER OR PEX - TYPE A TUBING AND SHALL BE CONTINUOUS. SPLICES OR FITTINGS SHALL NOT BE PERMITTED.	
11. EXTREME CAUTION MUST BE TAKEN SO THAT COPPER LINES AND INSULATION UNDER CONCRETE ARE NOT CRUSHED, CUT, SPLIT, RUPTURED OR DEFORMED DURING THE POURING OF THE FLOOR SLAB.	
GAS PIPING	
1. PROVIDE AN AGA APPROVED OR UL LISTED GAS VALVE, REGULATOR, AND A QUICK-DISCONNECT UNION AT EACH PIECE OF GAS FUELED EQUIPMENT AND AS INDICATED ON THE DRAWINGS. PROVIDE ATMOSPHERIC VENTS FOR GAS REGULATORS IN ACCORDANCE WITH LOCAL CODE AND SUPPLIER'S REQUIREMENTS. VALVES SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION. GAS VALVES 2 INCHES AND SMALLER SHALL BE AGA OR UL APPROVED. VALVES 2-1/2 INCHES AND LARGER SHALL BE CERTIFIED BY THE MANUFACTURER TO BE SUITABLE FOR GAS SERVICE AND SHALL BE MINIMUM 125 PSI RATED.	
2. ALL EXPOSED METALLIC PIPE AND TUBING SHALL BE PROTECTED AGAINST CORROSION IN ACCORDANCE WITH NFPA 54, INTERNATIONAL FUEL GAS CODE, AND AUTHORITY HAVING JURISDICTION. PROTECTIVE COATINGS AND WRAPPINGS SHALL BE OF APPROVED TYPE AND COLOR FOR THE INTENDED APPLICATION. GAS PIPING ROUTED EXPOSED AND IN FINISHED AREAS SHALL BE PAINTED YELLOW IN COLOR.	
3. ALL ABOVE GROUND, EXTERIOR PIPING SHALL BE MOUNTED NOT LESS THAN 3-1/2" ABOVE GRADE AND WHERE INSTALLED ON ROOF SURFACES, PIPING SHALL BE SUPPORTED AND LOCATED WHERE IT WILL BE PROTECTED FROM PHYSICAL DAMAGE. VERTICAL PIPING SHALL BE SUPPORTED BY GALVANIZED SPLIT RING, GALVANIZED UNISTRUT SYSTEM, OR GALVANIZED RISER CLAMPS. HORIZONTAL PIPING ON ROOF SHALL BE SUPPORTED BY A CLOSED-CELL POLYETHYLENE FOAM SUPPORT SYSTEM THAT IS UV AND WEATHER RESISTANT AND INCLUDE A GALVANIZED STRUT CHANNEL. BASIS OF DESIGN: FNM MODEL# FNM7701PP OR B-LINE DURABLOCK ROOFTOP PIPING SUPPORTS WITH COMPATIBLE UNISTRUT CLAMPS.	
4. WELDING SHALL BE PERFORMED BY STATE CERTIFIED WELDERS. PROVIDE WELDING CERTIFICATIONS TO A/E.	
5. GAS PIPING SHALL BE AS FOLLOWS:	
a. ABOVE-GRADE INSIDE OR OUTSIDE BUILDING, LOW PRESSURE - SCHEDULE 40 SEAMLESS BLACK STEEL PIPE, BEVELED ENDS.	
— 2" AND SMALLER - THREADED FITTINGS, WROUGHT IRON.	
— 2 1/2" AND LARGER - WELDED FITTINGS, BLACK STEEL.	
b. INSIDE BUILDING, REGULATED PRESSURE - SCHEDULE 40 BLACK STEEL WITH WELDED BLACK STEEL FITTINGS.	
c. BELOW GRADE, LOW AND MEDIUM PRESSURE GAS SERVICE - POLYETHYLENE PLASTIC ASTM D-2513 WITH STAB COUPLINGS OR FUSION WELD JOINTS.	
d. BELOW GRADE, HIGH PRESSURE SERVICE 60 PSI AND OVER - SCHEDULE 40 BLACK STEEL COATED AND WRAPPED WITH WELDED BLACK STEEL FITTINGS. INSTALL CATHODIC PROTECTION ANODE ON SERVICE LINE.	
e. VALVES SHALL NOT BE LOCATED ABOVE ACCESSIBLE CEILING SPACES (SUBJECT TO THE APPROVAL OF THE AUTHORITY HAVING JURISDICTION), WHETHER OR NOT SUCH SPACES ARE USED AS A PLENUM.	
FIXTURES AND EQUIPMENT (224000)	
1. FURNISH FIXTURES AND EQUIPMENT INDICATED AND SCHEDULED ON DRAWINGS. COMPLETE WITH ACCESSORIES, CONTROLS AND INSTALLATION ITEMS REQUIRED.	
2. INSTALL IN FULL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND PLACE IN SATISFACTORY OPERATION.	
3. FIXTURES AND EQUIPMENT SHALL BE AS INDICATED ON THE PLUMBING FIXTURE SCHEDULE.	
CLEANOUTS (221319)	
1. CLEANOUTS SHALL BE INSTALLED FLUSH WITH FINISHED FLOOR OR WALLS WITH PLATED COVERS.	
2. CLEANOUTS SHALL BE AS SCHEDULED ON DRAWINGS.	
INSULATION (220716 AND 220719)	
1. REFER TO INSULATION SCHEDULE FOR INSULATION R-VALUE AND THICKNESS REQUIREMENTS.	
2. CONDENSATE PIPING SHALL BE INSULATED WITH 1-INCH-THICK FIBERGLASS INSULATION WITH STANDARD VAPOR BARRIER JACKET OR WITH 1" THICK FLEXIBLE UNICELLULAR (ARMAFLEX).	
3. FIBERGLASS PIPE INSULATION SHALL BE PROVIDED WITH STANDARD VAPOR BARRIER JACKET AND HAVE A MAXIMUM CONDUCTIVITY OF 0.27 BTU PER '1HR-FT2-F". ALL INSULATION SHALL BE APPLIED IN FULL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.	
4. INSULATE FITTINGS, JOINTS, AND VALVES WITH INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE. PROVIDE REMOVABLE INSULATION SECTIONS TO COVER PARTS OF EQUIPMENT WHICH MUST BE OPENED PERIODICALLY FOR MAINTENANCE. FINISH WITH GLASS CLOTH OR PVC FITTING COVERS.	
5. ALL PRODUCTS LOCATED WITHIN PLENUM AREAS, INCLUDING BUT NOT LIMITED TO INSULATION AND ADHESIVE SYSTEMS, SHALL HAVE A COMPOSITE FIRE HAZARD RATING NOT TO EXCEED 25 FLAME SPREAD AND 50 SMOKE DEVELOPED PER ASTM E-84, NFPA 255 AND UL 723.	
6. ALL WASTE LINES FROM DRINKING WATER FOUNTAINS SHALL BE INSULATED WITH 1-INCH-THICK HEAVY-DUTY FIBERGLASS MATERIAL WITH ALL PURPOSE NONCOMBUSTIBLE VAPOR BARRIER JACKET. INSULATION SHALL HAVE A MAXIMUM THERMAL CONDUCTIVITY (K) OF 0.23 BTU/INHR"FT2"°F AT 76°F. ADHESIVE SYSTEMS THAT EMPLOY RELEASE PAPER WILL NOT BE ACCEPTABLE. ALL DRAINAGE PIPE SHALL BE SUPPORTED DIRECTLY ON EACH SIDE OF A JOINT.	
7. EXISTING PVC PIPING IN PLENUM CEILINGS SHALL BE INSULATED TO MEET PLENUM RATINGS, WITH PRODUCT TYPICAL TO FYR-WRAP. INSTALL AS REQUIRED BY MANUFACTURER.	
8. EXTREME CAUTION MUST BE TAKEN SO THAT COPPER LINES AND INSULATION UNDER CONCRETE ARE NOT CRUSHED, CUT, SPLIT, RUPTURED OR DEFORMED DURING THE POURING OF THE FLOOR SLAB.	
HANGERS AND SUPPORTS (220529)	
1. INSTALL PIPING SYSTEMS TO PERMIT FREE MOVEMENT FOR EXPANSION. SUPPORT	

DRAWING SET: 90% Submission
RELEASE DATE: 12/29/2024

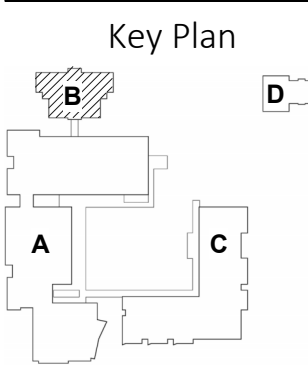
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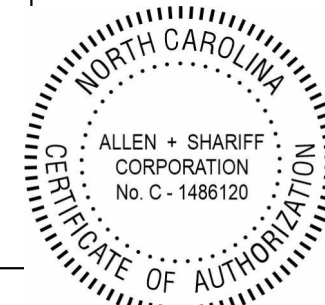
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PLUMBING
SPECIFICATIONS

P002-B



ALL PIPING FROM STRUCTURE WITH UL LISTED HANGERS AND SUPPORTS SUITABLE FOR THE INTENDED INSTALLATION. DESIGN, SELECTION, SPACING, AND APPLICATION OF HANGERS AND SUPPORTS SHALL COMPLY WITH ANSI B31.1, MSS SP-69, AND PIPE MANUFACTURER'S RECOMMENDED SPACING REQUIREMENTS.

2. PROVIDE INSULATION HANGER WITH PROTECTIVE SHIELDS ON SYSTEMS REQUIRING A VAPOR BARRIER. HANGER SHALL BE PROVIDED AT EACH CHANGE OF DIRECTION. HANGERS AND SUPPORTS SHALL BE SPACED AT INTERVALS WHICH WILL PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES; ALL PIPING SUPPORTS AND RESTRAINTS SHALL BE IN STRICT ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION GUIDELINES. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.

3. RISER CLAMPS SHALL BE INSTALLED ABOVE THE FLOOR AT EACH LEVEL. RISER CLAMPS MAY BE SUSPENDED BELOW FLOOR LEVEL, WITH HANGER RODS AND INSERTS, WHERE THE INSTALLATION OF ESCUTCHEON PLATES IS REQUIRED.

4. HANGER SPACING SHALL BE NO GREATER AND ROD SIZE SHALL BE NO SMALLER THAN THAT SHOWN IN THE ON THE HANGER SCHEDULE.

5. HANGERS FOR BLACK OR GALVANIZED STEEL PIPE SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL NO. 100, OR APPROVED EQUAL.

6. HANGERS FOR CAST IRON PIPE SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL NO. 400, OR APPROVED EQUAL.

7. HANGERS FOR COPPER TUBING SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL NO. 102-A, OR APPROVED EQUAL.

8. TRAPEZE HANGERS OF A TYPE APPROVED BY THE ENGINEER, MAINTAIN PIPE INSULATION AT PIPE ANCHORS. PROVIDE INSULATION COUPLERS AS SPECIFIED ABOVE.

9. CONTRACTOR SHALL PROVIDE INSULATION HANGER WITH PROTECTIVE SHIELDS, SUCH AS MICHIGAN HANGER CO., MODEL NO. 103, OR APPROVED EQUAL. 5-INCH-LONG SECTION OF 1/2 INCH THICK CALCIUM SILICATE SECTIONAL PIPE INSULATION WITH FACTORY LONGITUDINAL LAP SHALL BE PROVIDED AT HANGER POINTS. BUTT JOINTS SHALL BE SEALED WITH INSULATING CEMENT.

10. STRAP HANGERS SHALL NOT BE PERMITTED.

11. CONTRACTOR SHALL PROVIDE RISER CLAMPS FOR VERTICAL PIPING AT EACH LEVEL. RISER CLAPS SHALL BE MICHIGAN HANGER CO., MODEL NO. 510 FOR STEEL PIPING AND MODEL NO. 511 FOR COPPER TUBING OR APPROVED EQUAL. USE "SHORT-END" RISER CLAMPS WHERE SPACE IS LIMITED.

12. IN CONCRETE, MICHIGAN HANGER CO., MODEL NO. 355 INSERTS, OR APPROVED EQUAL. INSERTS SHALL PERMIT ADJUSTMENT FROM 3/4 INCH THROUGH 1-1/4 INCH. IN METAL DECKS, CONTRACTOR SHALL PROVIDE REDHEAD SDI INSERTS, OR APPROVED EQUAL. POWDER PROPELLED INSERTS WILL BE PERMITTED IN NEW CONSTRUCTION WHERE TYPE AND LOCATION ARE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

13. CONTRACTOR SHALL PROVIDE SIDE BEAM CLAMPS FOR SUPPORTING PIPING FROM STRUCTURAL STEEL MEMBERS. BEAM CLAMPS SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL 300 OR APPROVED EQUAL.

14. WHERE OTHER MEANS OF SUPPORT PIPING ARE REQUIRED OR DESIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE ENGINEER'S APPROVAL PRIOR TO INSTALLING THOSE SUPPORTS.

15. HANGER SHALL BE PROVIDED AT EACH CHANGE OF DIRECTION.

16. HANGERS AND SUPPORTS SHALL BE SPACED AT INTERVALS WHICH WILL PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.

17. RISER CLAMPS SHALL BE INSTALLED ABOVE THE FLOOR AT EACH LEVEL. RISER CLAMPS MAY BE SUSPENDED BELOW FLOOR LEVEL, WITH HANGER RODS AND INSERTS, WHERE THE INSTALLATION OF ESCUTCHEON PLATES IS REQUIRED.

VALVES (220523) AND SPECIALTIES (221119)

1. DOMESTIC WATER SHUT-OFF VALVES INSTALLED ON CPVC PIPING SHALL BE THREE PIECE BALL VALVE, FULL PORT, TRUE UNION TYPE, WITH PLASTIC BODY, BLOW-OUT PROOF STEM DESIGN AND O-RING STEM SEAL. PLASTIC PARTS SHALL BE CPVC. DOMESTIC WATER SHUT-OFF VALVES INSTALLED ON COPPER PIPING SHALL BE TWO PIECE BALL VALVE, FULL PORT, WITH BRASS BODY, STAINLESS STEEL BALL AND TRIM, BLOW-OUT PROOF STEM, AND REPLACEABLE "TEFLON OR TFE" SEATS AND SEALS. VALVES SHALL BE NIBCO OR EQUAL.

a. BALL VALVES 2-INCHES AND SMALLER SHALL BE 150 PSI SWP, 600 PSI WOG, BRONZE, 2-PIECE DESIGN, WITH PTFE TEFLON SEATS AND SEALS, AND BLOW-OUT PROOF STEMS MADE OF LEAD FREE BRONZE. VALVES SHALL HAVE THREADED ENDS FOR USE IN STEEL PIPING AND SOLDER OR PRESS-FIT ENDS FOR USE IN COPPER TUBING. BALL VALVES SHALL BE APOLLO 70LF-1170LF-200-11, OR APPROVED EQUAL. PROVIDE THERMA-SEAL INSULATING TEE HANDLES FOR VALVES USED IN LINES WHICH ARE TO BE INSULATED.

2. CHECK VALVES (3 INCH AND SMALLER) SHALL BE 125# WITH REMOVABLE, REGRINDABLE DISCS AND THREADED OR SOLDER JOINT ENDS. CHECK VALVES TO BE INSTALLED IN HORIZONTAL LINES SHALL BE HAMMOND, MODEL IB940, OR APPROVED EQUAL, (SCREWED JOINTS) OR HAMMOND, MODEL IB941, OR APPROVED EQUAL (SOLDER JOINTS). CHECK VALVES TO BE INSTALLED IN VERTICAL PIPING SHALL BE HAMMOND, MODEL IB939, OR APPROVED EQUAL. CONTRACTOR SHALL PROVIDE SWEAT-TO-THREAD ADAPTERS FOR SOLDER JOINT CONNECTIONS.

3. DOMESTIC WATER GATE VALVES FOR COPPER PIPING UP TO AND INCLUDING 2-1/2 INCHES SHALL BE NIBCO NO. S-111 OR APPROVED EQUAL. CLASS 125, 200 PSIG WOG, BRONZE BODY WITH SOLDERED ENDS, RISING STEM, SOLID WEDGE, AND SCREWED BONNET. DOMESTIC WATER GATE VALVES FOR COPPER PIPING 3 INCHES AND 4 INCHES SHALL BE CRANE NO. 465-12 OR APPROVED EQUAL, 200# WOG CAST IRON OS&Y VALVE WITH CLASS 125 ANSI B16.1 FLAT FACED FLANGED ENDS AND BRONZE TRIM. STEMS, DISC FACES, SEAT FACES, SEAT RINGS AND BONNET BUSHINGS CONSTRUCTED OF BRONZE. ALL OF THE ABOVE GATE VALVES SHALL BE USED FOR STOP OR ISOLATION VALVE APPLICATIONS. IN LIEU OF GATE VALVES FOR PIPING 2 INCHES AND SMALLER, NIBCO 585-70 BALL VALVES MAY BE USED.

4. SHOCK ARRESTORS SHALL BE LOCATED DOWNSTREAM OF THE DOMESTIC WATER SERVICE VALVE, AT EACH SERVICE TO A GROUP OF FIXTURES, OR AS INDICATED ON THE DRAWINGS. SHOCK ARRESTORS SHALL BE AS MANUFACTURED BY PRECISION PLUMBING PRODUCTS OR APPROVED EQUAL AND CONFORM TO THE REQUIREMENTS OF THE PLUMBING AND DRAINAGE INSTITUTE. INSTALL SHOCK ABSORBERS AT EACH FIXTURE OR WHERE REQUIRED TO PREVENT WATER HAMMER IN ACCORDANCE WITH STANDARD PDI-WH 201.

5. PROVIDE STOP VALVES AT ALL FIXTURE AND EQUIPMENT SUPPLIES. ALL EXPOSED FIXTURE CONNECTIONS SHALL BE CHROME PLATED, STAINLESS STEEL, OR FITTED WITH CHROME PLATED SLEEVES. PROVIDE VACUUM BREAKERS WHERE REQUIRED BY CODE INCLUDE UNIONS, OR OTHER DISCONNECT MEANS, STOPS OR VALVES FOR ISOLATION OF FIXTURES AND EQUIPMENT. VALVES SHALL FULLY BE COMPATIBLE WITH PIPING FOR SERVICE INTENDED. AS MANUFACTURED BY APOLLO, NIBCO, CRANE, OR OTHER APPROVED MANUFACTURER. INCLUDE HOSE OR DRAIN VALVES AT LOW POINTS WHERE FIXTURES CANNOT BE USED FOR DRAINAGE.

6. REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY SHALL BE WATTS NO# LF909-S SERIES OR APPROVED EQUAL. IF IT COMPLIES WITH THESE SPECIFICATIONS EQUIPMENT MANUFACTURED BY CLA-VAL COMPANY, FEBCO, HERSEY PRODUCTS, INC., OR WATTS REGULATION COMPANY WILL BE ACCEPTABLE. ASSEMBLY SHALL BE COMPLETE WITH STRAINER, DRAIN LINES, INLET AND OUTLET SHUT-OFF VALVES AND WATTS SERIES 'AG' AIR GAP. THE PRESSURE LOSS OVER THE ENTIRE ASSEMBLY SHALL NOT EXCEED 10 PSI AT THE DESIGN FLOW. THE SIZE OF THE ASSEMBLY SHALL NOT BE SMALLER THAN THE LINE SIZE IN WHICH IT IS INSTALLED. BACKFLOW PREVENTER ASSEMBLY SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION. RELIEF OUTLET PIPE SHALL DISCHARGE TO NEAREST FLOOR DRAIN OR OTHER APPROVED LOCATION OF DISCHARGE. DO NOT INSTALL ABOVE FINISHED CEILINGS, UNLESS NOTED OR INDICATED OTHERWISE.

7. STRAINERS

a. Y-TYPE STRAINERS - BRONZE 3" AND SMALLER

i. STRAINER BODY TO BE ASTM B584 OR B62 BRONZE WITH THREADED OR SOLDER END CONNECTIONS AND .033 INCH PERFORATED TYPE 304 STAINLESS STEEL SCREEN OR 20 MESH TYPE 304 STAINLESS STEEL SCREEN ACCESSIBLE WITHOUT REMOVING THE STRAINER FROM THE LINE.

b. Y-TYPE STRAINERS - IRON 3" AND SMALLER

i. STRAINER BODY TO BE CLASS 250 THREADED, TAPPED SCREW-IN BONNET WITH PLUG AND STAINLESS-STEEL SCREEN. BODY AND BONNET TO BE ASTM A126. SCREEN MUST BE ACCESSIBLE WITHOUT REMOVING THE STRAINER FROM THE LINE.

c. Y-TYPE STRAINERS - IRON 2 1/2" AND LARGER

i. STRAINER BODY TO BE CLASS 125 FLANGED, TAPPED BOLTED BONNET WITH PLUG AND STAINLESS-STEEL SCREEN. BODY AND BONNET TO BE ASTM A126. SCREEN MUST BE ACCESSIBLE WITHOUT REMOVING THE STRAINER FROM THE LINE.

d. ACCEPTABLE MANUFACTURERS -

- NIBCO
- APOLLO
- WATTS

8. FLOOR CEILING AND WALL PLATES

a. FIT PIPE PASSING THROUGH WALLS, FLOORS OR CEILINGS IN FINISHED ROOMS WITH STEEL OR BRASS ESCUTCHEONS. WHERE SURFACE IS TO RECEIVE A PAINT FINISH ESCUTCHEONS SHALL BE PRIME PAINTED; OTHERWISE MAKE ESCUTCHEONS NICKEL OR CHROME PLATED. WHERE PIPING IS INSULATED, FIT ESCUTCHEONS OUTSIDE INSULATION.

EQUIPMENT (220500)

1. MAKE ALL FINAL EQUIPMENT AND FIXTURE CONNECTIONS AND PROVIDE THE NECESSARY ADAPTORS, FITTINGS, VALVES, DEVICES, ETC. FOR A COMPLETE AND OPERABLE SYSTEM. PROVIDE COMPLETE WITH BASES, ISOLATORS, SUPPORTS AND OTHER REQUIRED ACCESSORIES. PROVIDE VALVES AND UNIONS WHERE NEEDED TO PERMIT DISCONNECTIONS OF EACH PIECE OF EQUIPMENT FOR REPAIRS. PLUMBING CONNECTIONS SHOWN ARE NOMINAL. VERIFY EXACT CONNECTION SIZE WITH EACH PIECE OF EQUIPMENT SUPPLIED.

2. EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURER'S DATA AND INSTALLATION INSTRUCTIONS, INCLUDING CLEARANCES, LUBRICATE AND ADJUST AS REQUIRED. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CHECK AND CONFORM TO THESE REQUIREMENTS PRIOR TO STARTING WORK. FURNISH AND INSTALL CLEAN SET OF FILTERS PRIOR TO BALANCING.

3. THE CONTRACTOR SHALL COORDINATE THE ELECTRICAL CHARACTERISTICS OF ALL MECHANICAL EQUIPMENT PRIOR TO ORDERING OF EQUIPMENT. COORDINATE REQUIREMENT FOR PROVISION OF MOTOR STARTERS, DISCONNECTS, CONTACTORS, CONTROL WIRING, ETC. AS REQUIRED FOR A PROPER FUNCTIONING SYSTEM WITH ELECTRICAL CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.

4. ALL FLOOR MOUNTED EQUIPMENT SHALL BE INSTALLED ON CONCRETE HOUSEKEEPING PADS. MINIMUM PAD THICKNESS SHALL BE NOMINAL 4". PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4" ON EACH SIDE. CONCRETE PADS SHALL BE PROVIDED BY THIS CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE THIS CONTRACTOR TO COORDINATE THE SIZE AND LOCATION OF THE CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.

5. ISOLATION EQUIPMENT SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER AND SHALL BE DESIGNED SPECIFICALLY FOR THE APPLICATION REQUIRED. THIS INCLUDES, BUT IS NOT LIMITED TO, PIPING DUTYWORK, PUMPS, COMPRESSORS, VIBRATION ISOLATORS SHALL BE RATED FOR THE WEIGHT AND SPACING REQUIRED FOR THE EQUIPMENT REQUIRING ISOLATION.

6. ALL CONDENSATE DRAINS SHALL BE TRAPPED PER DETAIL ON MECHANICAL DRAWINGS. PROVIDE CLEANOUT(S). PROVIDE AUXILIARY DRAIN PANS AT ALL EQUIPMENT WHERE DAMAGE TO ANY BUILDING COMPONENT COULD OCCUR AS A RESULT OF OVERFLOW OR STOPPAGE OF THE PRIMARY SYSTEM. WATER LEVEL DETECTION SHALL BE PROVIDED IN AUXILIARY PAN TO PROVIDE SHUT DOWN OF EQUIPMENT.

7. PROVIDE CURBS FOR ALL ROOF OPENINGS FOR DUCTS, FLUES, PIPING AND EQUIPMENT. CURBS SHALL BE FURNISHED AS ACCESSORIES TO THE EQUIPMENT OR 8" HIGH PATE OR EQUAL EQUIPMENT SUPPORTS SPANNING STRUCTURE AND FLASHED INTO ROOFING. ALL CUTTING, FLASHING, AND PATCHING OF THE ROOF SHALL BE BY OWNER'S ROOFING CONTRACTOR AND PAID FOR BY PLUMBING CONTRACTOR.

8. SEAL JOINTS BETWEEN PLUMBING FIXTURES AND THE SURFACE TO WHICH THEY ARE MOUNTED USING SANITARY-TYPE, ONE-PART, MILDEW RESISTANT SILICONE SEALANT. MATCH SEALANT COLOR TO FIXTURE COLOR.

IDENTIFICATION (220553)

1. CONTRACTOR SHALL PROVIDE IDENTIFICATION LABELS, TAGS, ETC. AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN. THE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI STANDARD A13.1. PRESSURE SENSITIVE MARKERS SHALL BE MANUFACTURED BY THE BRADY CO. OR APPROVED EQUAL. MARKERS SHALL BE MANUFACTURER'S STANDARD PRODUCT. PRESSURE SENSITIVE PIPE MARKERS SHALL BE MANUFACTURED BY THE BRADY CO. OR APPROVED EQUAL. PIPE MARKERS SHALL BE MANUFACTURER'S STANDARD PRODUCT.

2. PIPE LABEL LOCATIONS: LOCATE PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE ACCESSIBLE CEILINGS IN FINISHED SPACES; MACHINE ROOMS; ACCESSIBLE MAINTENANCE SPACES SUCH AS SHAFTS, TUNNELS, AND PLENUMS; AND EXTERIOR EXPOSED LOCATIONS AS FOLLOWS:

- NEAR EACH VALVE AND CONTROL DEVICE.
- NEAR EACH BRANCH CONNECTION, EXCLUDING SHORT TAKEOFFS FOR FIXTURES AND TERMINAL UNITS. WHERE FLOW PATTERN IS NOT OBVIOUS, MARK EACH PIPE AT BRANCH.
- NEAR PENETRATIONS AND ON BOTH SIDES OF THROUGH WALLS, FLOORS, CEILINGS, AND INACCESSIBLE ENCLOSURES.
- AT ACCESS DOORS, MANHOLES, AND SIMILAR ACCESS POINTS THAT PERMIT VIEW OF CONCEALED PIPING.
- NEAR MAJOR EQUIPMENT ITEMS AND OTHER POINTS OF ORIGATION AND TERMINATION.
- SPACED AT MAXIMUM INTERVALS OF 50 FEET (15 m) ALONG EACH RUN. REDUCE INTERVALS TO 25 FEET (7.6 m) IN AREAS OF CONGESTED PIPING AND EQUIPMENT.

3. PROVIDE VALVE TAGS AND VALVE CHART PER ASME A13.1 SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS.

MOTOR CONTROLLERS (230500)

1. UNLESS OTHERWISE INDICATED, EVERY MOTOR NOT SPECIFIED TO BE PROVIDED WITH A CONTROLLER AT THE FACTORY SHALL BE PROVIDED WITH A CONTROLLER AS SPECIFIED HEREIN. CONTROLLERS SHALL BE FURNISHED BY THIS CONTRACTOR, THE INSTALLATION OF ALL CONTROLLERS SHALL BE BY THE ELECTRICAL CONTRACTOR.

2. MOTOR CONTROLLERS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF NEMA STANDARD IC-1, INDUSTRIAL CONTROL AND BE HEAVY DUTY CONSTRUCTION. CONTROLLER SIZES SHALL BE VERIFIED TO BE COMPATIBLE WITH HORSEPOWER OF THE MOTOR. CONTROLLERS SHALL BE MANUFACTURED BY ALLEN-BRADLEY CO., GENERAL ELECTRIC, CUTLER-HAMMER OR APPROVED EQUAL.

3. MANUAL MOTOR STARTERS:

a. SWITCHES SHALL BE TUMBLER-SWITCH STYLE. THE MANUAL MOTOR STARTERS SHALL PROVIDE OVERLOAD PROTECTION WHICH CLOSELY FOLLOWS THE MOTOR LOAD. MANUAL MOTOR STARTERS FOR OUTDOOR USE SHALL BE NEMA TYPE 4X, INDOOR USE SHALL BE NEMA TYPE 1, EXPLOSION PROOF USE SHALL BE NEMA TYPE 7.

4. MAGNETIC MOTOR CONTROLLERS:

a. MAGNETIC MOTOR CONTROLLERS SHALL BE PROVIDED AS INDICATED. THEY SHALL NOT BE SMALLER THAN NEMA SIZE 1.

b. NON-REVERSING MAGNETIC CONTROLLER SHALL BE UTILIZED TO START FULL VOLTAGE, NON-REVERSING, AC SINGLE SPEED MOTORS. THE CONTROLLERS SHALL BE SIZED FOR THE LOAD UNLESS OTHERWISE INDICATED.

c. REVERSING MAGNETIC CONTROLLER SHALL BE UTILIZED TO START FULL VOLTAGE REVERSING, AC SINGLE SPEED MOTORS. THE CONTROLLER SHALL BE SIZED FOR THE LOAD UNLESS OTHERWISE INDICATED. LOCATION OF REVERSING MAGNETIC CONTROLLERS IS INDICATED ON THE DRAWINGS.

d. WHERE MULTI-SPEED MOTORS ARE SCHEDULED ON THE DRAWINGS, THE MOTOR CONTROLS SHALL BE COMPATIBLE WITH THE TYPE MOTOR SHOWN.

e. OVERLOAD RELAYS SHALL BE SOLID STATE AND BE SUPPLIED IN EACH LEG. OVERLOAD RELAYS SHALL BE MATCHED TO LOAD AND SHALL BE ADJUSTABLE FROM 90% TO 110%. A SINGLE RESET BUTTON SHALL BE MOUNTED ON THE STARTER DOOR TO PERMIT EXTERNAL RESET. RELAYS SHALL BE CONVERTIBLE FROM MANUAL TO AUTOMATIC RESET BY A SIMPLE ADJUSTMENT.

f. CONTROL TRANSFORMERS SHALL BE PROVIDED WHERE REQUIRED. BOTH LEGS OF THE PRIMARY AND ONE LEG OF THE SECONDARY OF THE CONTROL TRANSFORMER SHALL BE PROTECTED BY NEMA CLASS J FUSES. THE OTHER LEG OF THE SECONDARY SHALL BE GROUNDED. CONTROL TRANSFORMER CAPACITY SHALL BE ADEQUATE TO OPERATE ALL CONTROL DEVICES IN THE CIRCUIT. CONTROL VOLTAGE SHALL BE 120V AC UNLESS OTHERWISE SPECIFIED.

g. UNLESS OTHERWISE INDICATED, ALL MOTOR STARTERS SHALL BE PROVIDED WITH HAND-OFF-AUTOMATIC (H.O.A.) SWITCH IN THE DOOR. ENCLOSURES FOR MAGNETIC STARTERS SHALL BE NEMA TYPE 1 FOR INDOOR USE, NEMA TYPE 4X FOR OUTDOOR USE AND NEMA TYPE 7 FOR EXPLOSION PROOF USE.

h. MOTOR CONTROLLERS SHALL BE PROVIDED WITH ALL CONTROL DEVICES, INCLUDING AUXILIARY CONTACTS, REQUIRED FOR EQUIPMENT TO OPERATE AS SPECIFIED.

5. COMBINATION MOTOR CONTROLLERS:

a. COMBINATION MOTOR CONTROLLERS SHALL BE PROVIDED WITH MOLDED CASE MOTOR CIRCUIT PROTECTORS OR MOLDED CASE CIRCUIT BREAKERS AS INDICATED. MOTOR CIRCUIT PROTECTIVE DEVICES SHALL HAVE SHORT CIRCUIT CAPACITY AS REQUIRED. UNIT CONTROL CIRCUIT FUSING SHALL BE PROVIDED. THE MOTOR CIRCUIT PROTECTIVE DEVICE SHALL BE MOUNTED IN THE SAME ENCLOSURE AS THE MAGNETIC CONTROLLER AND SHALL BE OPERABLE BY HAND FROM OUTSIDE THE ENCLOSURE. THE HANDLE SHALL BE SO INTERLOCKED WITH THE DOOR THAT IT MUST BE RETURNED TO THE "OFF" POSITION BEFORE THE DOOR CAN BE OPENED, BUT A COIN-PROOF DEFEAT MECHANISM SHALL BE PROVIDED TO ALLOW AUTHORIZED PERSONNEL TO OPEN THE ENCLOSURE DOOR WITHOUT OPENING THE DISCONNECTING DEVICE. PROVISIONS FOR PADLOCKING THE DISCONNECT HANDLE IN THE "OFF" POSITION SHALL BE MADE. THE ENCLOSURE FOR COMBINATION STARTERS SHALL BE NEMA TYPE 1 FOR INDOOR USE AND NEMA TYPE 4X FOR OUTDOOR USE, AND NEMA TYPE 7 FOR EXPLOSION PROOF USE.

b. MOTOR CIRCUIT PROTECTORS SHALL BE THE CONTINUOUSLY ADJUSTABLE, INSTANTANEOUS MAGNETIC TRIP TYPE CIRCUIT BREAKER AND SHALL BE SO CONSTRUCTED THAT ALL POLES OPEN, CLOSE AND TRIP SIMULTANEOUSLY.

6. OVERLOAD AND SHORT CIRCUIT PROTECTION:

a. HEATER ELEMENTS SHALL BE PROVIDED FOR OVERLOAD PROTECTION. MOTOR CIRCUIT PROTECTOR SHALL BE PROVIDED FOR MOTOR SHORT CIRCUIT PROTECTION.

DISCONNECT SWITCHES (230500)

1. THIS CONTRACTOR SHALL FURNISH ALL SAFETY DISCONNECT SWITCHES (FUSED AND NON-FUSED) REQUIRED FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT. IN ADDITION, THIS CONTRACTOR SHALL FURNISH A SAFETY DISCONNECT SWITCH FOR ALL MOTORS AND EQUIPMENT WHICH DO NOT HAVE COMBINATION STARTERS OR INTEGRAL DISCONNECTING MEANS. FUSIBLE DISCONNECT SWITCHES SHALL BE PROVIDED FOR ALL EQUIPMENT RATED FOR USE ONLY WITH FUSES (SUCH AS CONDENSING UNITS, COMPRESSORS, ETC.). SUCH SWITCHES SHALL BE ONE, TWO OR THREE POLE TYPE, WITH SOLID NEUTRAL FOR 4 WIRE SERVICE, AND SHALL HAVE THE PROPER CURRENT AND VOLTAGE RATING AS REQUIRED. THE INSTALLATION OF ALL DISCONNECT SWITCHES SHALL BE BY THE ELECTRICAL CONTRACTOR.

2. ALL SAFETY SWITCHES SHALL BE NEMA HEAVY DUTY TYPE AND SHALL CARRY THE UNDERWRITERS' LABORATORIES LABEL. FUSIBLE SWITCHES SHALL INCORPORATE CLASS "R" FUSE REJECTION FEATURE AND SHALL BE BRACED TO WITHSTAND 200,000 AMPERE RMS SYMMETRICAL FAULT CURRENT. SAFETY SWITCHES SHALL CONFORM TO FEDERAL SPECIFICATION W-S-865.

3. PROVIDE HEAVY-DUTY TYPE, SHEET ENCLOSED, SAFETY SWITCHES. THE TYPE, SIZE, AND RATING SHALL BE AS INDICATED ON THE DRAWINGS OR AS REQUIRED BY THE MOTOR OR EQUIPMENT SERVED. THE ENCLOSURE FOR DISCONNECT SWITCHES SHALL BE NEMA TYPE 1 FOR INDOOR USE, NEMA TYPE 4X FOR OUTDOOR USE AND NEMA TYPE 7 FOR EXPLOSION PROOF USE. DISCONNECTS SHALL BE MANUFACTURED BY ALLEN-BRADLEY, GENERAL ELECTRIC, CUTLER-HAMMER APPROVED EQUAL.

4. SWITCHES SHALL INCORPORATE QUICK-MAKE, QUICK-BREAK OPERATING HANDLES. THE MECHANISM SHALL BE AN INTEGRAL PART OF THE BOX, NOT THE COVER, AND SWITCHES SHALL HAVE A COVER INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF THE SWITCH DOOR IN THE ON POSITION OR CLOSING OF THE SWITCH MECHANISM WITH THE DOOR OPEN. CURRENT CARRYING PARTS SHALL BE CONSTRUCTED OF HIGH-CONDUCTIVITY COPPER WITH SILVER-TUNGSTEN TYPE SWITCH CONTACT.

5. FUSE CLIPS SHALL BE POSITIVE PRESSURE TYPE REINFORCED FUSE CLIPS.

6. THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND CONNECT ALL POWER WIRING TO ALL MECHANICAL CONTRACTOR FURNISHED EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL FURNISH, INSTALL AND CONNECT ALL CONTROL WIRING TO ALL FURNISHED EQUIPMENT, INCLUDING CONTROL DEVICES, STARTERS AND INTEGRAL DISCONNECT SWITCHES OF CONTRACTOR FURNISHED EQUIPMENT.

VARIABLE FREQUENCY DRIVES (230500)

1. PROVIDE VARIABLE FREQUENCY DRIVES (VFD) AS SPECIFIED HEREIN AND AS SHOWN ON THE CONTRACT DRAWINGS. BASIS OF DESIGN IS ABB MODEL ACH-550. THE ENCLOSURE FOR VFD SHALL BE NEMA TYPE 12 FOR INDOOR USE AND NEMA TYPE 3R FOR OUTDOOR USE. VFD SHALL PROVIDE MICROPROCESSOR-BASED CONTROL FOR THREE-PHASE INDUCTION MOTORS USING PULSE WIDTH MODULATED (PWM) DESIGN, WHICH CONVERTS THE UTILITY INPUT VOLTAGE AND FREQUENCY TO A VARIABLE VOLTAGE AND FREQUENCY OUTPUT VIA A TWO-STEP OPERATION. VFD SHALL HAVE AN EFFICIENCY AT FULL LOAD AND SPEED THAT EXCEEDS 97%. EFFICIENCY SHALL EXCEED 90% AT 50% SPEED.

2. VFD SHALL MAINTAIN A MINIMUM LINE SIDE DISPLACEMENT POWER FACTOR OF 0.96, REGARDLESS OF SPEED AND LOAD FOR VFD'S LESS THAN 75 HP. VFD SHALL MAINTAIN A MINIMUM LINE SIDE DISPLACEMENT POWER FACTOR OF .99, REGARDLESS OF SPEED AND LOAD FOR MOTORS GREATER THAN 75 HP. THE VFD'S SHALL HAVE A ONE (1) MINUTE OVERLOAD CURRENT RATING OF 110% FOR LOW OVERLOAD APPLICATIONS. VFD SHALL HAVE AN INTEGRAL EMI/RFI FILTER AND CIRCUIT BREAKER AS STANDARD. THE CURRENT WITHSTAND RATING OF THE OPEN VFD SHALL BE 65,000 AIC.

3. COMMUNICATION CAPABILITY OPTIONS SHALL INCLUDE MODBUS RTU, JOHNSON CONTROLS METASYS N2, BACNET MSTP, BACNET/IP, MODBUS/RTU AND EXPANSION CARD COMMUNICATIONS SHALL INCLUDE LONWORKS. THE EXACT PROTOCOL NEEDED IS THAT WHICH WILL COMMUNICATE WITH THE BAS COMMUNICATION SYSTEM PROVIDED.

4. VFD SHALL HAVE A COOLING FAN(S) THAT IS FIELD REPLACEABLE.

5. VFD SHALL INCLUDE THE FOLLOWING PROTECTIVE FEATURES: OVERCURRENT, OVERVOLTAGE, SYSTEM FAULT, UNDER VOLTAGE, INPUT LINE SUPERVISION, OUTPUT PHASE SUPERVISION, UNDER TEMPERATURE, OVER TEMPERATURE, MOTOR STALLED, MOTOR OVER TEMPERATURE AND MOTOR UNDER LOAD. VFD SHALL PROVIDE GROUND FAULT PROTECTION DURING POWER-UP, STARTING, AND RUNNING.

6. WARRANTY SHALL BE TWENTY-FOUR (24) MONTHS FROM CERTIFIED START-UP DATE. THIS WARRANTY DURATION INCLUDES START-UP BY AN AUTHORIZED SERVICE REPRESENTATIVE AND PARTS, LABOR, AND TRAVEL TIME.

CHECK, TEST, START, ADJUST, BALANCE AND INSTRUCTIONS (220593)

1. AFTER THE INSTALLATION, CHECK ALL EQUIPMENT, AND PERFORM START UP IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

2. PERFORM A HYDROSTATIC PRESSURE TEST ON ALL PIPING, AT THE PIPING SYSTEM WORKING PRESSURE, FOR A MINIMUM PERIOD OF 24-HOURS. REPAIR ANY LEAKS AND RETEST TO DEMONSTRATE TIGHTNESS. STOP-LEAK COMPOUNDS WILL NOT BE ALLOWED. ALL PIPING FOR PRESSURIZED WATER SYSTEMS SHALL HAVE A MINIMUM PRESSURE RATING OF 150 PSI.

3. CONCEALED OR INSULATED WORK SHALL REMAIN UNCOVERED UNTIL REQUIRED TESTS HAVE BEEN COMPLETED, BUT IF THE CONSTRUCTION SCHEDULE REQUIRES IT, ARRANGE FOR PRIOR TESTS ON PARTS OF SYSTEM AS APPROVED BY THE TENANT.

4. START UP AND PLACE ALL SYSTEMS IN OPERATION AND TAG ALL VALVES, SWITCHES AND CONTROLS WITH PERMANENT LABELS.

5. PROVIDE OWNER TRAINING AND DEMONSTRATION OF ALL PLUMBING SYSTEMS AND EQUIPMENT. INSTRUCT OWNER ON PROPER OPERATION AND PREVENTATIVE MAINTENANCE OF SYSTEM. SUBMIT OPERATING AND MAINTENANCE MANUAL ON ALL EQUIPMENT AND SYSTEMS.

DRAWING SET: 90% Submission
RELEASE DATE: 12/29/2024

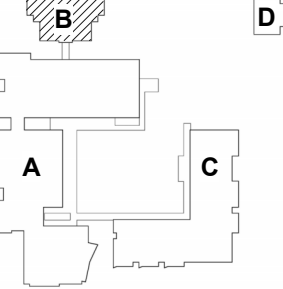
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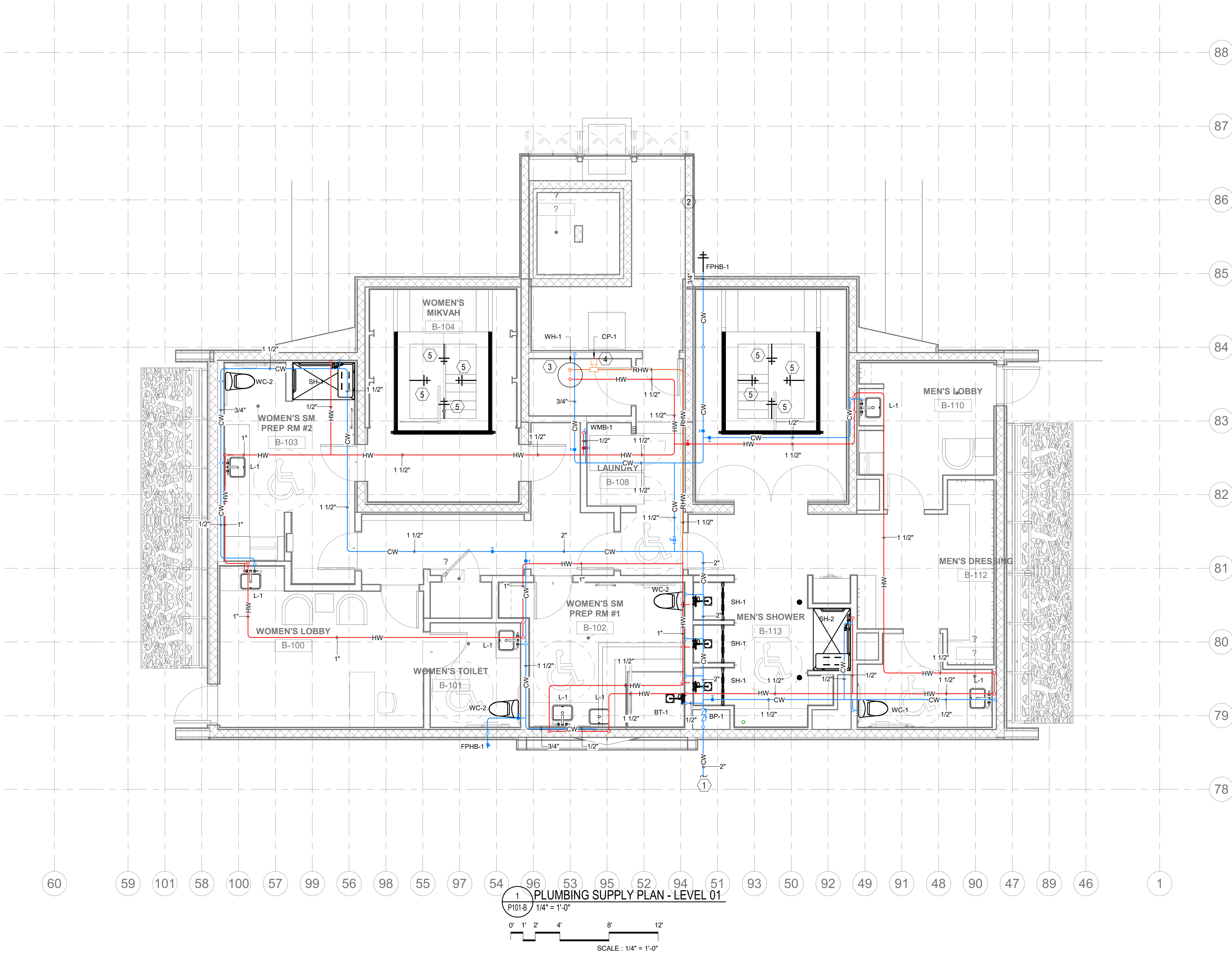
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Key Plan

PLUMBING SPECIFICATIONS
P003-B





PLUMBING SUPPLY GENERAL NOTES:

1. PIPING INSTALL IN PLENUMS SHALL BE COPPER.
2. FIRESTOPPING IS REQUIRED AT ALL SLAB AND WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.
3. PROVIDE EXPANSION LOOPS AT EVERY 50' TO 75' IN STRAIGHT COLD WATER PIPE RUNS.
4. PROVIDE TRAP PRIMERS TO ALL FLOOR DRAINS ON THIS LEVEL. REFER TO TYPICAL TRAP PRIMER DETAIL #4 ON SHEET P-301 FOR ADDITIONAL INFORMATION.

PLUMBING SUPPLY KEY NOTES: (#)

1. PROVIDE 2\"/>
2. REFER TO DOMESTIC WATER SERVICE ENTRANCE DETAIL #11 ON SHEET P301 FOR ADDITIONAL INFORMATION.
3. REFER TO TYPICAL WATER HEATER (WH-1) DETAIL #9 ON SHEET P301 FOR ADDITIONAL INFORMATION.
4. REFER TO CIRCULATION PUMP DETAIL #6 ON SHEET P301 FOR ADDITIONAL INFORMATION.
5. PROVIDE 3/4\"/>

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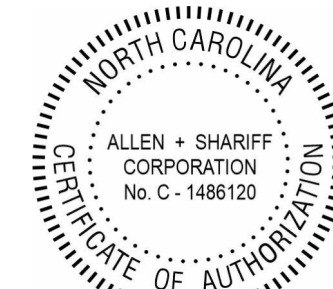
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Key Plan
PLUMBING SUPPLY
PLAN - LEVEL 01

P101-B

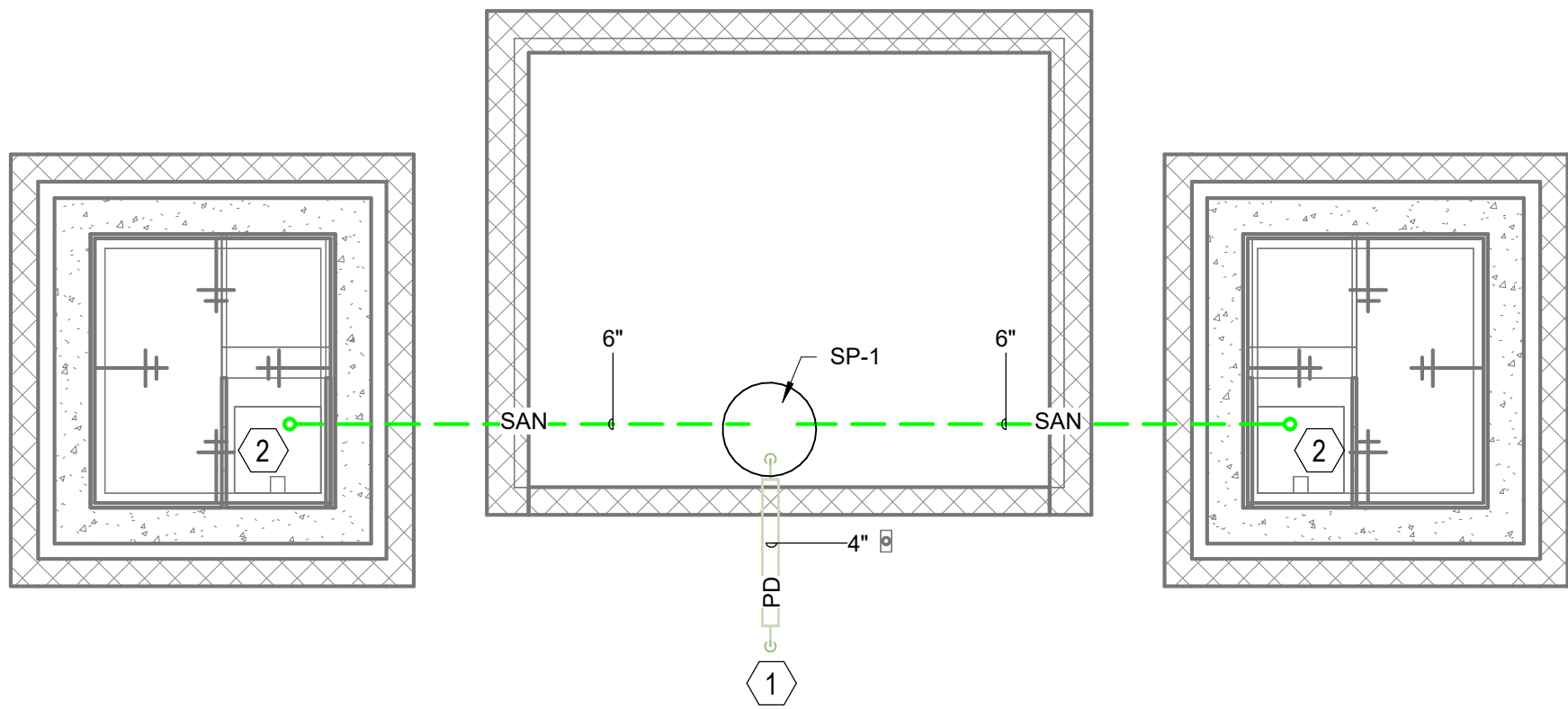


PLUMBING DRAINAGE GENERAL NOTES:

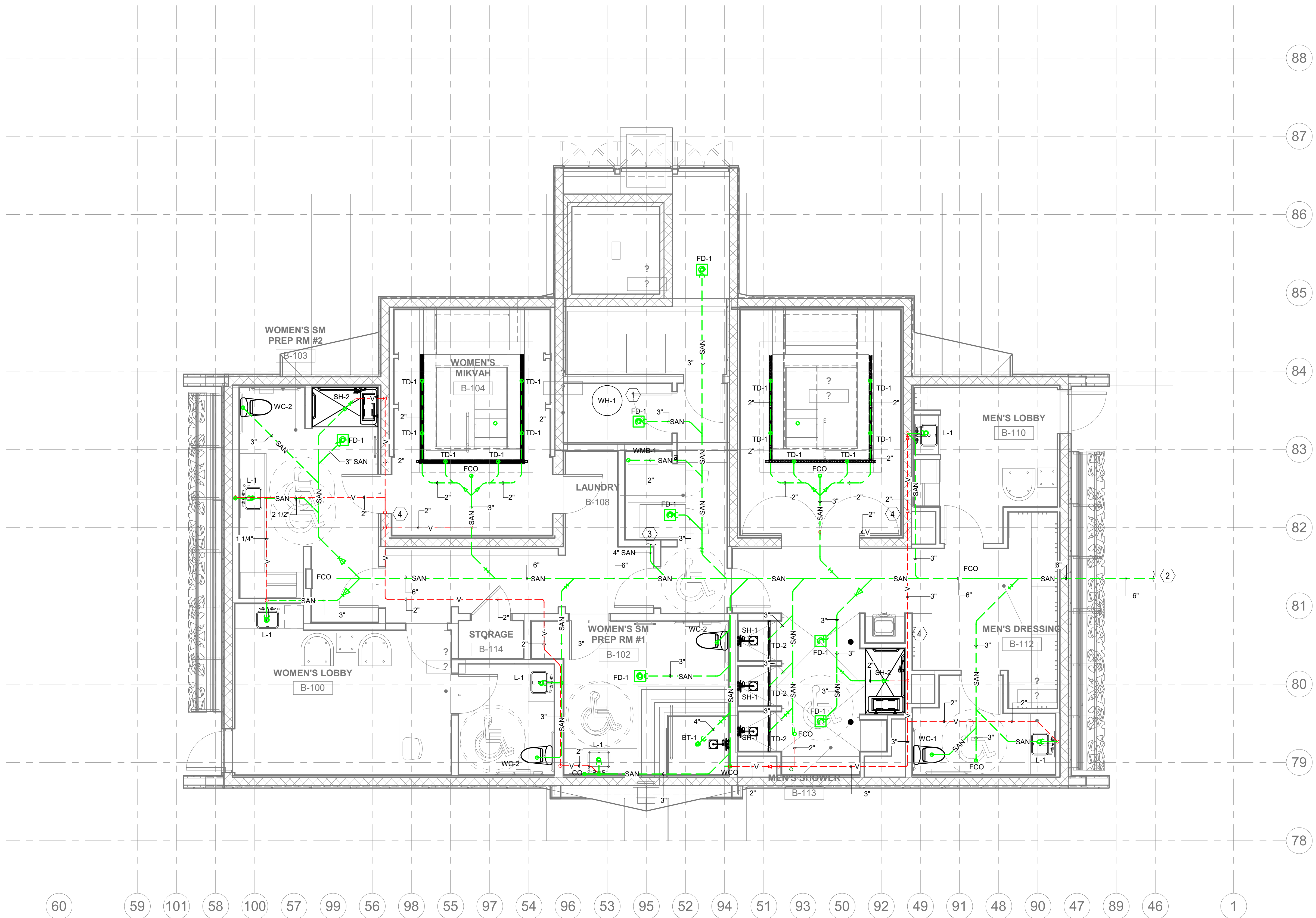
1. FIRESTOPPING IS REQUIRED AT ALL SLAB AND WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.

PLUMBING DRAINAGE KEY NOTES: (1) (2)

1. PROVIDE 4" DRAINAGE CONNECTION FROM SUMP PUMP (SP-1) TO THE SANITARY SYSTEM. FOR ADDITIONAL INFORMATION SEE SHEET P202-B AND SUMP PUMP DETAIL #12 ON SHEET P201-B.
2. PROVIDE 6" SANITARY PIPING CONNECTION TO SANITARY OUTLET OF THE BASIN FOR DISCHARGING. CONTRACTOR SHALL VERIFY FINAL LOCATION FOR CONNECTION POINT.



1
P201-B
PLUMBING DRAINAGE PLAN - LEVEL 00
0' 1' 2' 4' 8' 12'
SCALE : 1/4" = 1'-0"



- PLUMBING DRAINAGE GENERAL NOTES:**
1. PIPING INSTALL IN PLENUMS SHALL BE CAST IRON OR COPPER.
 2. FIRESTOPPING IS REQUIRED AT ALL SLAB AND WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.
 3. PROVIDE TRAP PRIMERS TO ALL FLOOR DRAINS ON THIS LEVEL. REFER TO TYPICAL TRAP PRIMER DETAIL #3 ON SHEET P-301 FOR ADDITIONAL INFORMATION.

- PLUMBING DRAINAGE KEY NOTES: (#)**
1. REFER TO TYPICAL WATER HEATER (WH-1) DETAIL #9 ON SHEET P301-B FOR ADDITIONAL INFORMATION.
 2. PROVIDE 6" SANITARY PIPING 5 FT OUTSIDE OF BUILDING AND MAKE CONNECTION WITH SITE CIVIL SANITARY PIPING. COORDINATE INVERT ELEVATION WITH SITE CIVIL ENGINEER.
 3. PROVIDE 4" SANITARY PIPING CONNECTION WITH SUMP PUMP ON THE FLOOR BELOW. FOR CONTINUATION, SEE SHEET P201-B.
 4. PROVIDE 4" VENT PIPING THROUGH THE ROOF.

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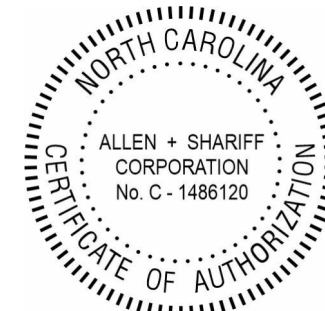
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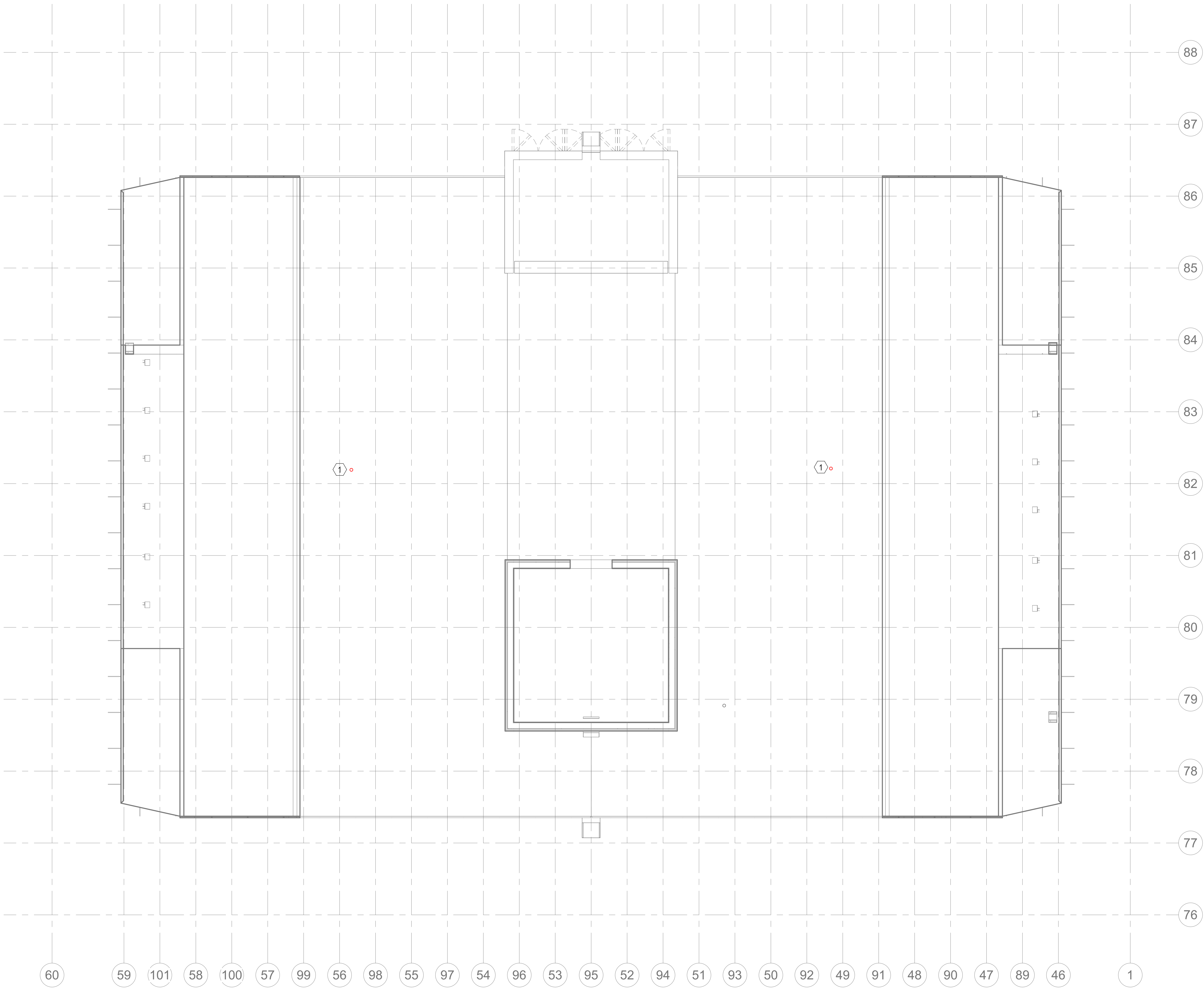
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Key Plan
PLUMBING DRAINAGE
PLAN - LEVEL 1

P202-B





1 PLUMBING DRAINAGE PLAN - ROOF
P203-B 1/4" = 1'-0"

0' 1' 2' 4' 8' 12'
SCALE : 1/4" = 1'-0"

PLUMBING DRAINAGE GENERAL NOTES:

1. PIPING INSTALL IN PLENUMS SHALL BE COPPER OR CAST IRON.
2. FIRESTOPPING IS REQUIRED AT ALL SLAB AND WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.

PLUMBING DRAINAGE KEY NOTES: (1)

1. PROVIDE 4" VENT PIPING THROUGH THE ROOF. REFER TYPICAL VENT THROUGH ROOF DETAIL #8 ON SHEET P301-B.

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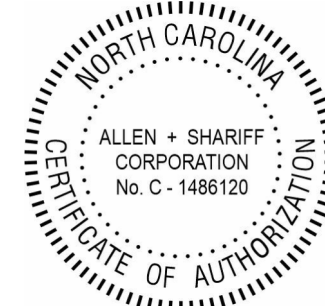
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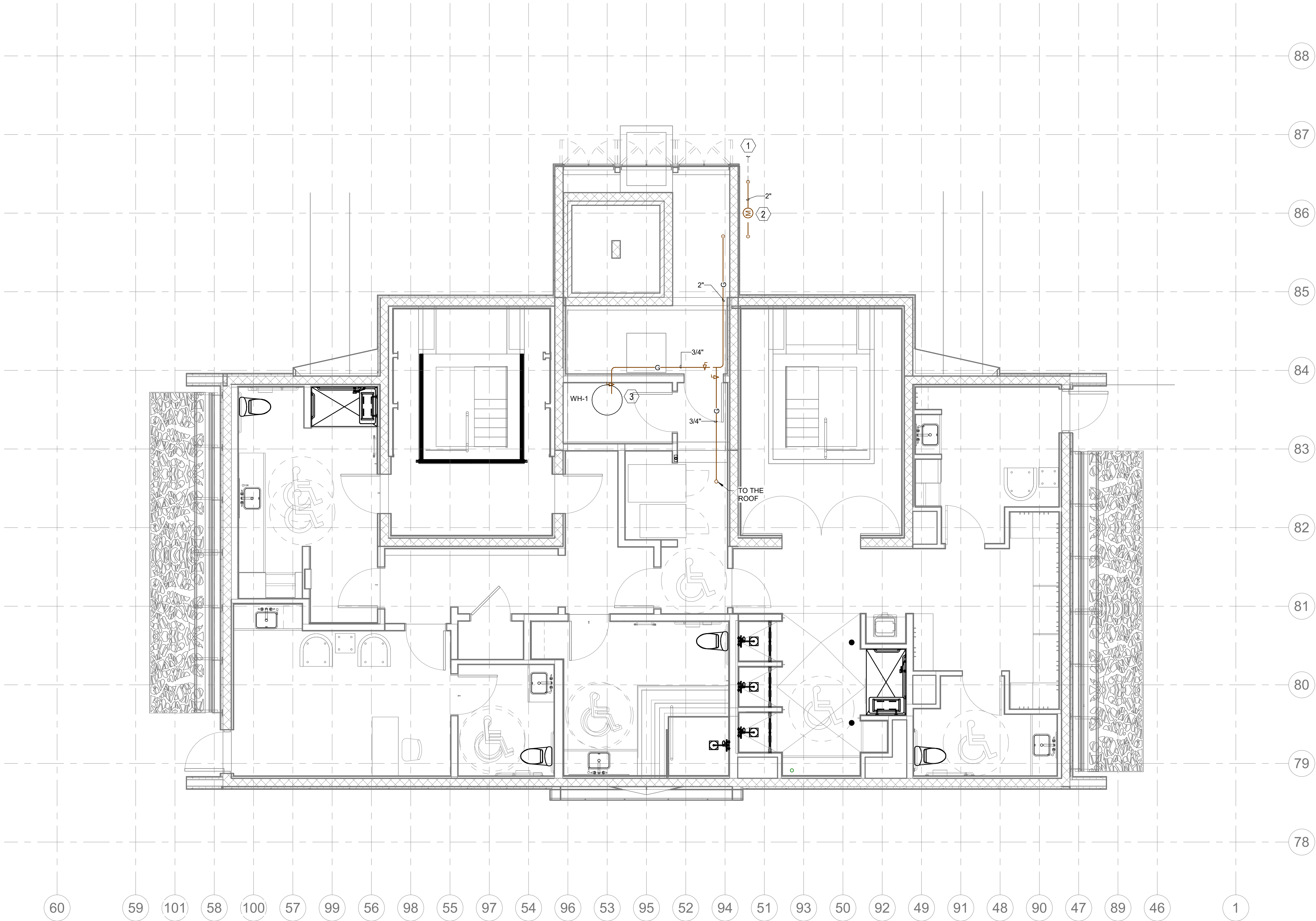
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Key Plan
A B C D
PLUMBING DRAINAGE
PLAN - ROOF

P203-B





- PLUMBING GAS GENERAL NOTES:**
1. FIRESTOPPING IS REQUIRED AT ALL SLAB AND WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.
- PLUMBING GAS KEY NOTES:** (#)
1. GAS PIPING CONTINUED ON SITE/CIVIL DRAWINGS.
 2. REFER TO TYPICAL GAS METER SET / RISER DETAIL # 10 ON SHEET P301 FOR ADDITIONAL INFORMATION.
 3. PROVIDE 3/4" GAS CONNECTION TO WATER HEATER.

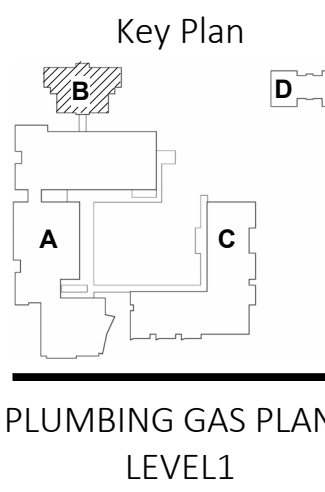
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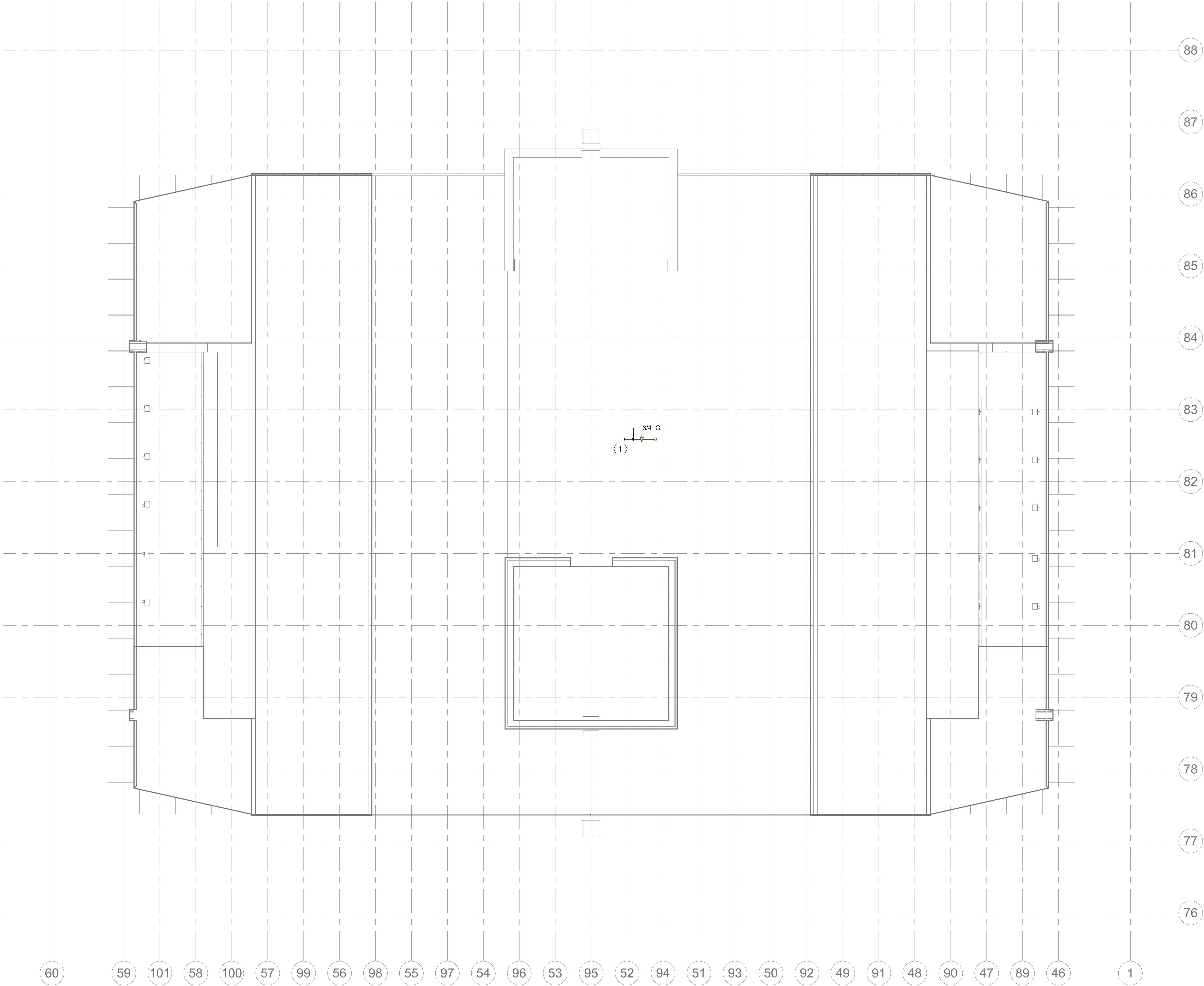


PLUMBING GAS PLAN - LEVEL 01

P205-B

1 PLUMBING GAS PLAN - LEVEL 01
P205-B 1/4" = 1'-0"





PLUMBING GAS GENERAL NOTES:

1. FIRESTOPPING IS REQUIRED AT ALL SLAB AND WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS.

PLUMBING GAS KEY NOTES: (#)

1. PROVIDE 3/4\"/>

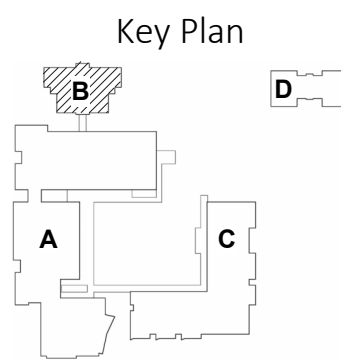
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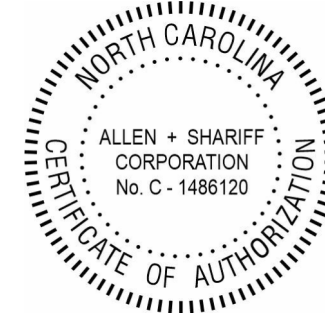
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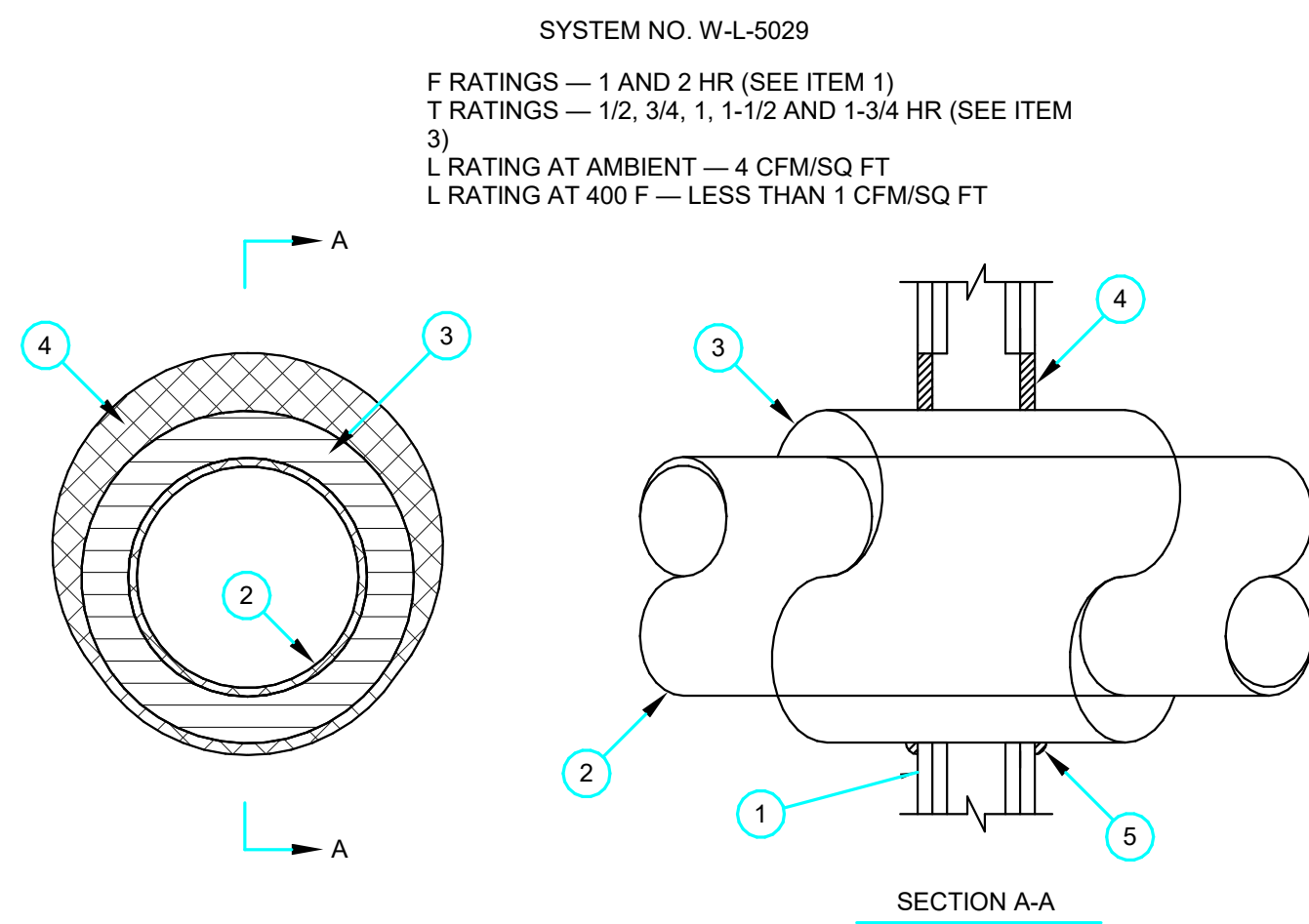
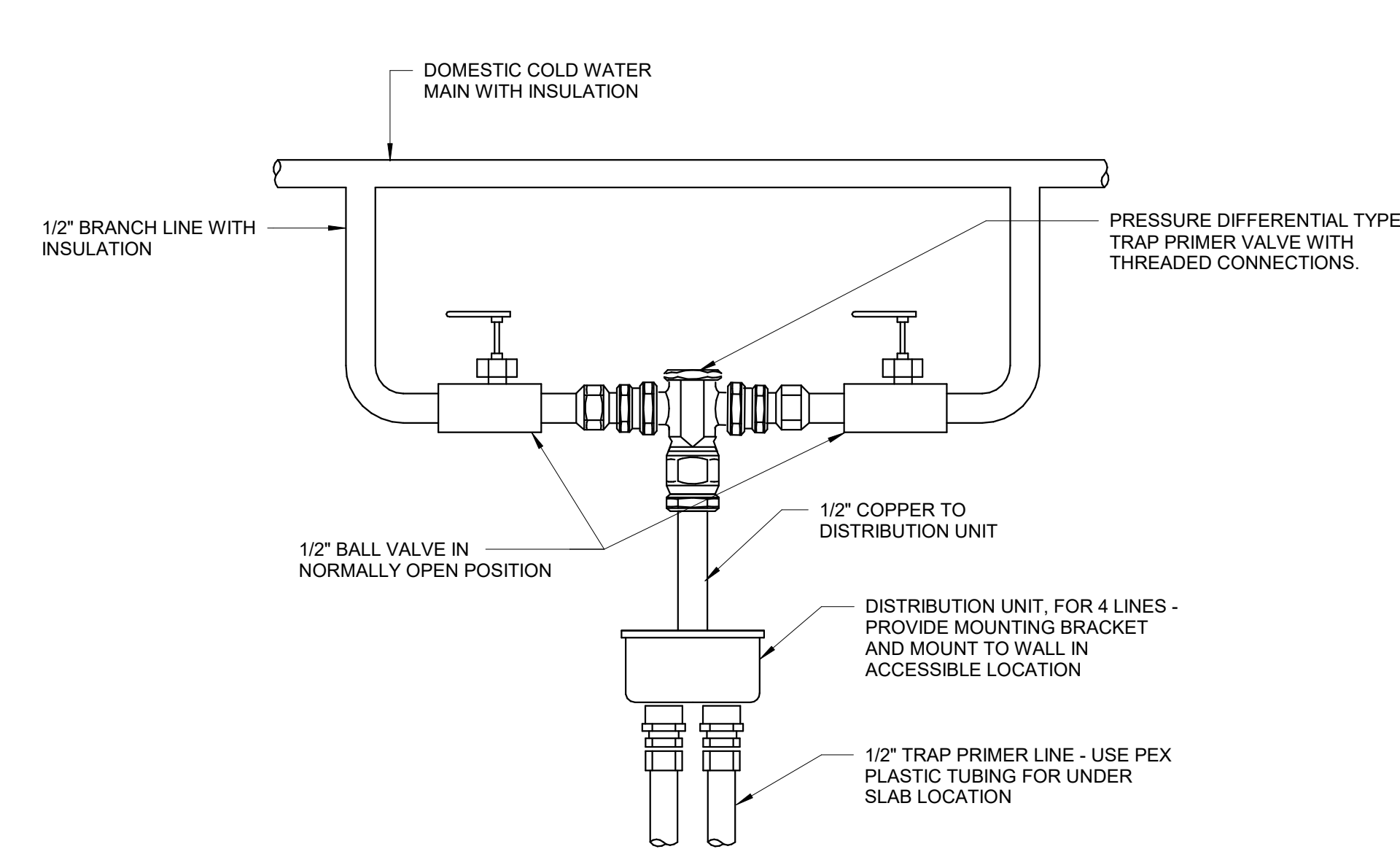
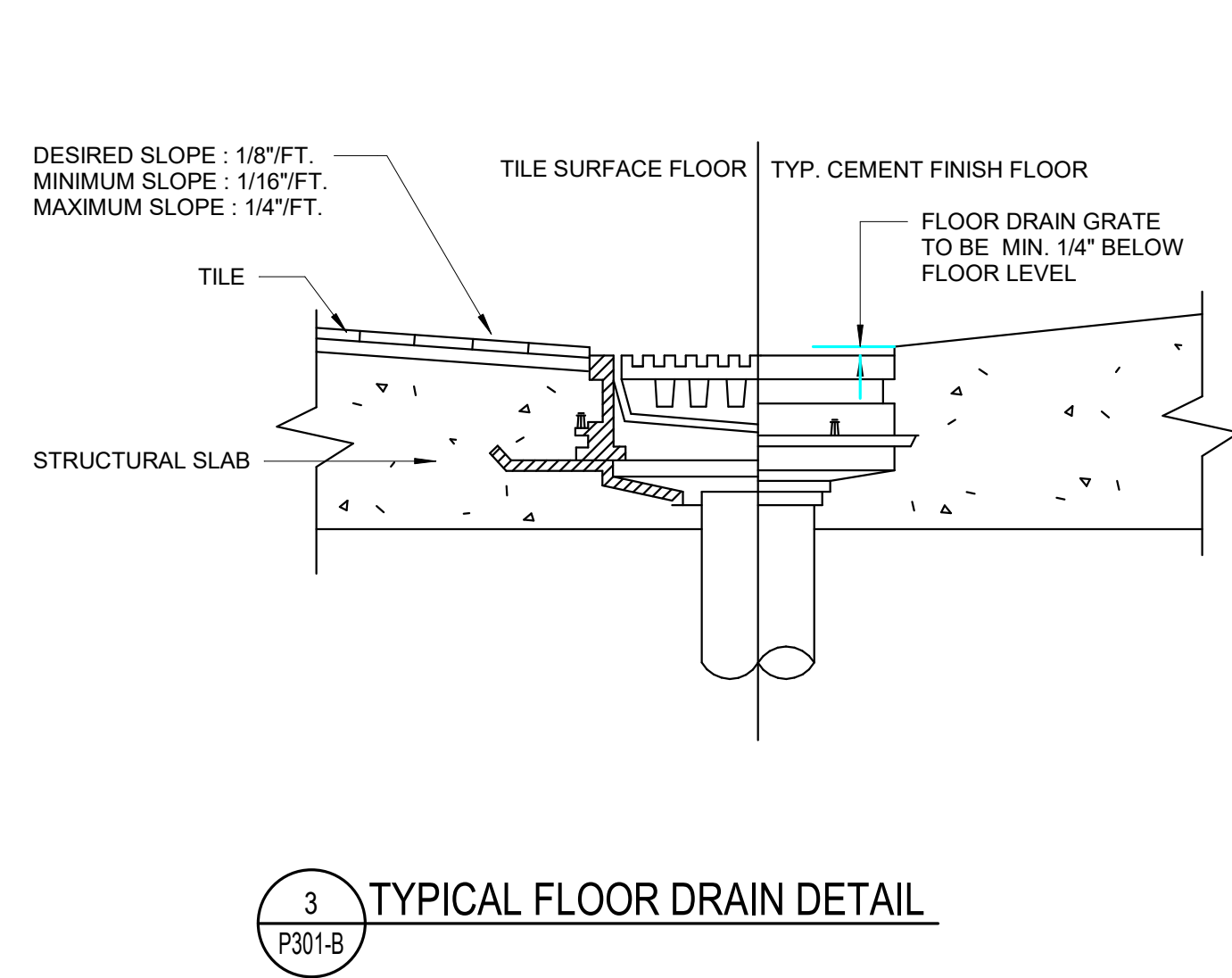
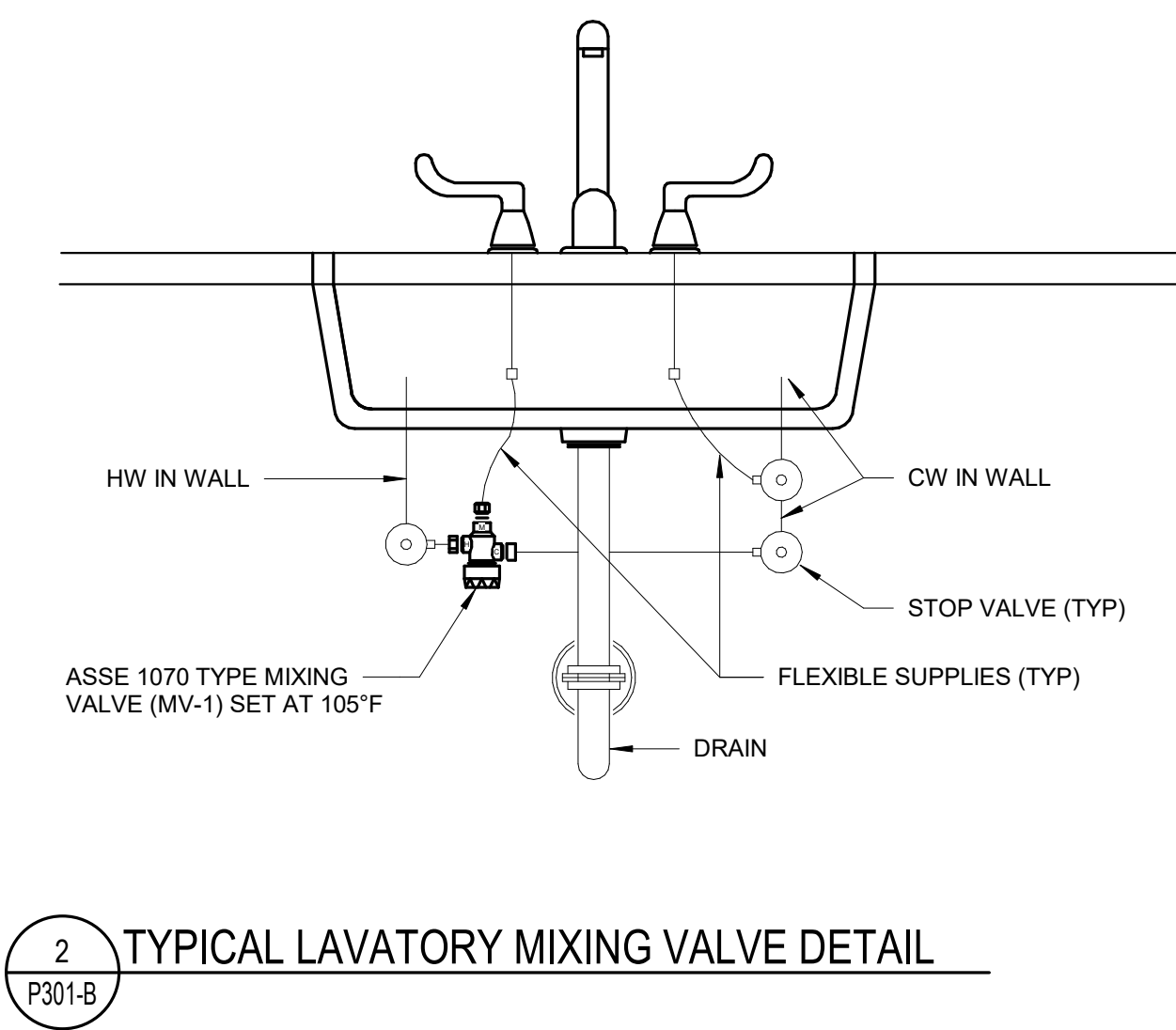
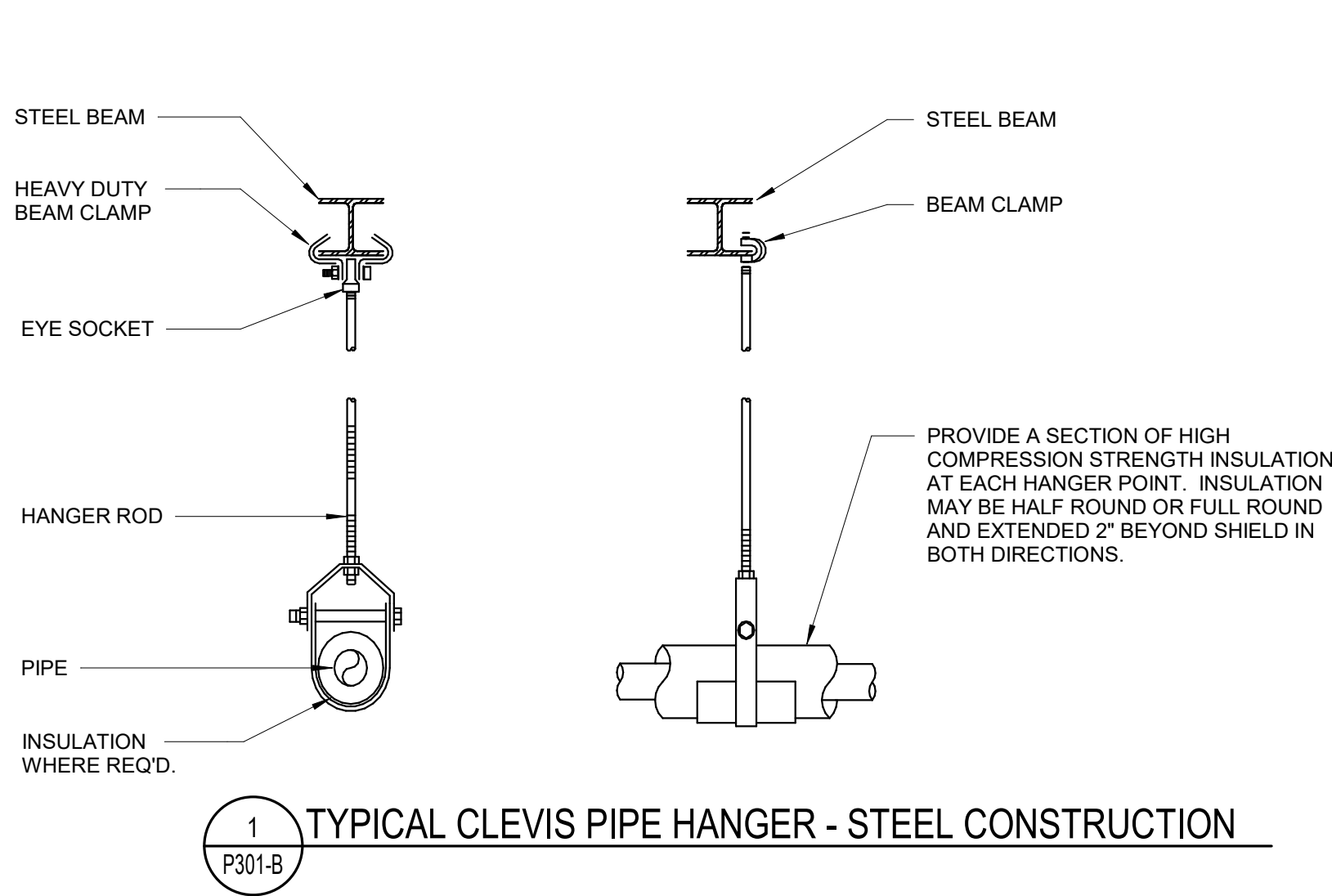
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PLUMBING GAS PLAN - ROOF

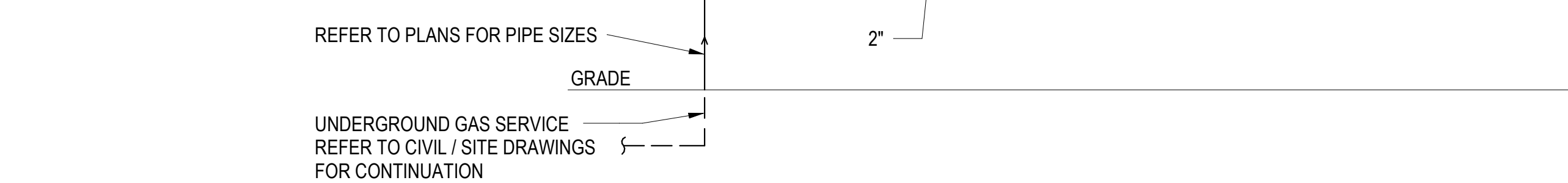
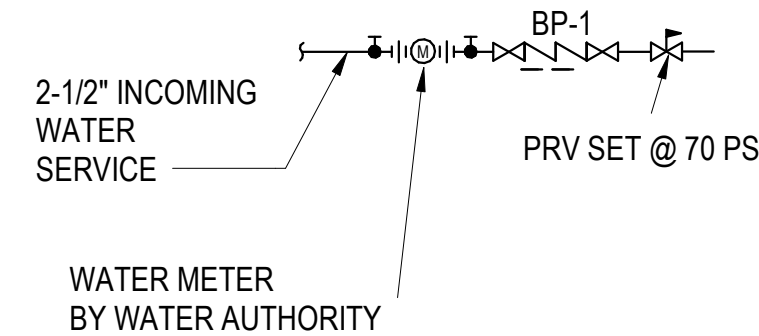
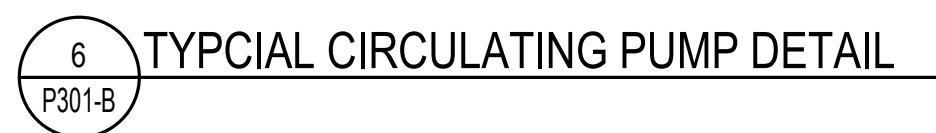
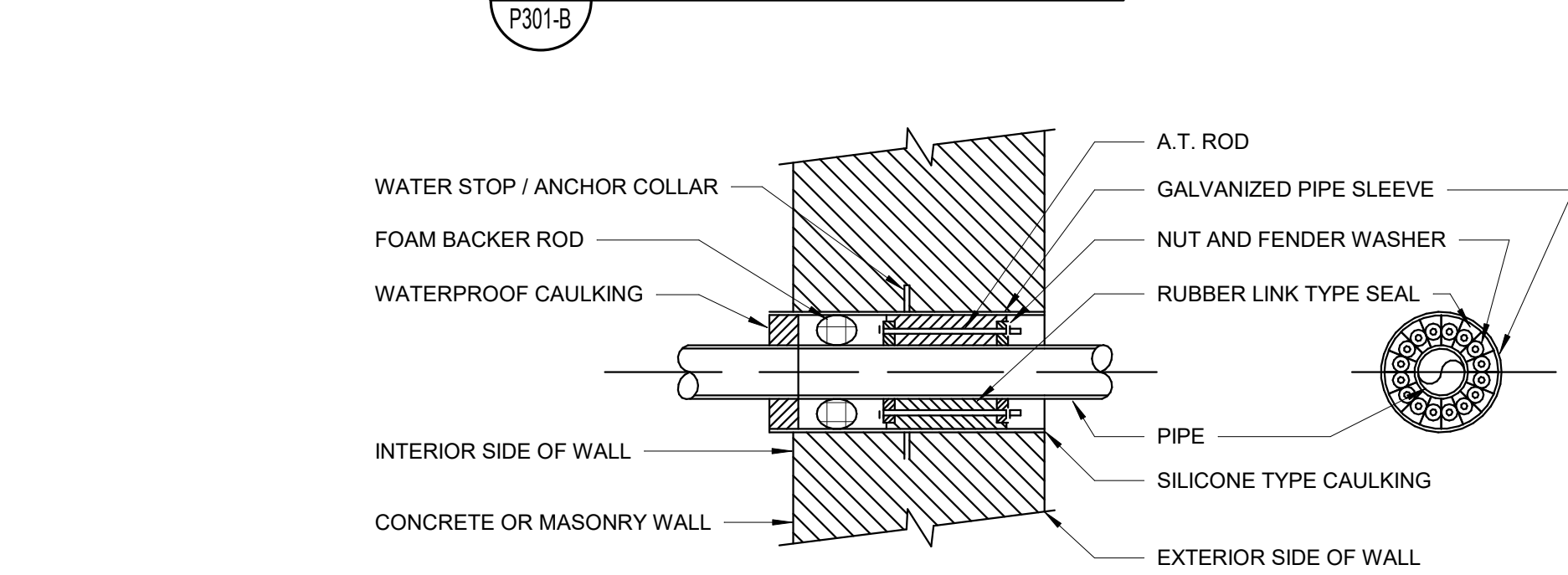
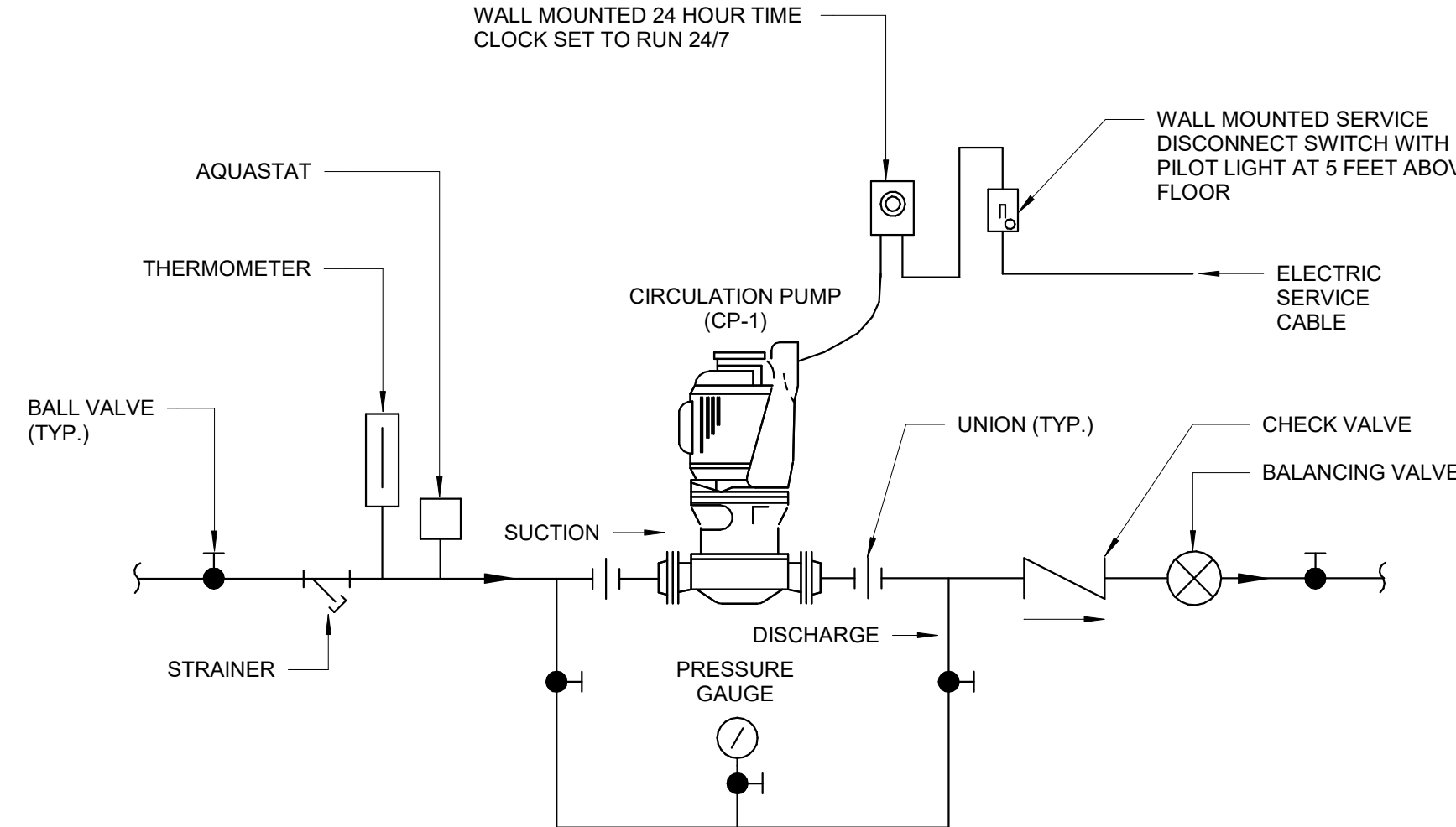
P206-B





WALL ASSEMBLY RATING HR	THROUGH PENETRANT		PIPE COVERING THICK IN.	ANNULAR SPACE		T RATING HR
	TYPE +	MAX DIAM IN.		MIN IN.	MAX IN.	
1	A	4	1	0	1-1/2	1/2
1	B or C	2	1 or 1-1/2	0	1-1/2	1/2
1	A	4	1-1/2	0	1-1/2	1
1	A	12	2	0	1-7/8	3/4
1	B or C	6	2	0	1-7/8	1
2	A	4	1	0	1-1/2	1
2	B or C	4	1 or 1-1/2	0	1-1/2	1
2	B or C	6	2	0	1-7/8	1
2	A	4	1-1/2	0	1-1/2	1-3/4
2	A	12	2	0	1-7/8	1-1/2
2	B or C	6	2	0	1-7/8	1

+ INDICATES PENETRANT TYPE AS ITEMIZED IN ITEM 2.



- WALL ASSEMBLY — THE 1 OR 2 HR FIRE-RATED GYPSUM BOARD/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 TAPERED EDGES. THE GYPSUM BOARD 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 18-5/8 IN. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
- THROUGH PENETRANTS — ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
 - STEEL PIPE — NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
 - IRON PIPE — NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
 - COPPER TUBING — NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE — NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
- PIPE COVERING* — NOM 1, 1-1/2 OR 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT.
 - PIPE COVERING* — (NOT SHOWN) — AS AN ALTERNATE TO ITEM 3, MAX 2 IN. THICK CYLINDRICAL CALCIUM SILICATE (MIN 14 PCF) UNITS SIZED TO THE OUTSIDE DIAM OF THE PIPE OR TUBE MAY BE USED. PIPE INSULATION SECURED WITH STAINLESS STEEL BANDS OR MIN 8 AWG STAINLESS STEEL WIRE SPACED MAX 12 IN. OC. WHEN THE ALTERNATE PIPE COVERING IS USED, THE T RATING SHALL BE DETERMINED FROM THE TABLE ABOVE.
- FILL VOID OR CAVITY MATERIAL* — SEALANT — MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS. FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN PIPE COVERING AND GYPSUM BOARD, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE COVERING/GYPSUM BOARD INTERFACE ON BOTH SURFACES OF WALL.
- HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE SEALANT.

*BEARING THE UL CLASSIFICATION MARK

DRAWING SET: 90% Submission
RELEASE DATE: 12/29/2024

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Key Plan
A B C
PLUMBING DETAILS

P301-B



PUBLIC - PLUMBING FIXTURE CONNECTION SCHEDULE										
MARK	FIXTURE TYPE	CW	HW	WASTE	VENT	MANUFACTURER	MODEL NUMBER	FAUCET/FLUSH VALVE	ACCESSORIES	REMARKS
WC-1	FLOOR MOUNTED FLUSH VALVE WATER CLOSET - 1.28 GPF	1"	---	4"	2"	TOTO - ELONGATED	CT705ULNG	TOTO - TET1LA32#CP - ECOPOWER - 1.28 GPF	BARRIER FREE; TOTO (SC534) ELONGATED OPEN FRONT SEAT WITH STAINLESS STEEL CHECK HINGE	1, 2, 3, 5
WC-2	FLOOR MOUNTED FLUSH VALVE WATER CLOSET - 1.28 GPF - ADA ACCESSIBLE	1"	---	4"	2"	TOTO - ELONGATED	CT705ULNG	TOTO - TET1LA32#CP - ECOPOWER - 1.28 GPF	BARRIER FREE; TOTO (SC534) ELONGATED OPEN FRONT SEAT WITH STAINLESS STEEL CHECK HINGE	1, 2, 3, 5
L-1	WALL MOUNTED LAVATORY - ADA ACCESSIBLE	1/2"	1/2"	1-1/4"	1-1/4"	TOTO	MODEL # LT307 A#01 - THP5067#CP	TOTO T23M32 - 0.35GPM WITH ECOPOWER AND THERMOSTATIC MIXING VALVE	BARRIER FREE; BRAIDED STAINLESS STEEL SUPPLIES; 1/4 TURN VALVES; GRID DRAIN; TRAP; INTERGAL ASSE-1070 MIXING VALVE	1, 2, 4, 5
SH-1	SHOWER - PUBLIC	1/2"	1/2"	2"	1-1/2"	---	---	AMERICAN STANDARD MODEL: FFAS9088-100500B/CO NEO MODERN 3-WAY RAIN SHOWER SYSTEM	MOLDED IN SOAP DISH TRAY; PROVIDE ADJUSTABLE BOWED CURTAIN ROD; WHITE SHOWER CURTAIN	1, 2, 5
SH-2	SHOWER - ADA ACCESSIBLE - PUBLIC	1/2"	1/2"	2"	1-1/2"	AQUATIC	16030BFSBTTR 60 X 30 ONE PIECE SHOWER	AMERICAN STANDARD MODEL: FFAS9088-100500B/CO NEO MODERN 3-WAY RAIN SHOWER SYSTEM	MOLDED IN SOAP DISH TRAY; PROVIDE ADJUSTABLE BOWED CURTAIN ROD; WHITE SHOWER CURTAIN	1, 2, 5
BT-1	BATHTUB - PUBLIC	3/4"	3/4"	4"	1-1/2"	---	---	AMERICAN STANDARD MODEL: FFAS9088-100500B/CO NEO MODERN 3-WAY RAIN SHOWER SYSTEM	---	1, 2, 5

- REMARKS:
1. PROVIDE ALL REQUIRED COMPONENTS FOR COMPLETE FIXTURE ROUGH-IN, I.E., SUPPLIES & STOPS - MCGUIRE #LFBV09-SS QUARTER TURN STOPS, TRAPS - MCGUIRE #8912, CARRIERS - ZURN 1200 SERIES, GRID DRAINS & TAILPIECES - MCGUIRE #155A, ETC. NOT ALL
REQUIRED COMPONENTS ARE SPECIFIED ABOVE.
 2. FIXTURES SHALL BE ADA COMPLIANT AND PROVIDED WITH ADA COMPLIANT ACCESSORIES. MOUNT AT ADA COMPLIANT ELEVATIONS. SEE ARCHITECTURAL PLAN FOR ELEVATIONS.
 3. COORDINATE FLUSH VALVE INSTALLATION WITH ADA GRAB BAR. VALVE SHALL BE LOCATED SO THAT GRAB BAR DOES NOT INTERFERE WITH USE OF VALVE. PROVIDE TAILPIECE EXTENSION AS REQUIRED.
 4. PROVIDE MCGUIRE PRO-WRAP WHITE ANTI-MICROBIAL INSULATING WRAP ON EXPOSED UNDER LAVATORY OR SINK SUPPLY AND WASTE PLUMBING.
 5. REFER TO ARCHITECTURAL DRAWINGS FOR FIXTURE PLAN LOCATION DIMENSION REQUIREMENTS AND COORDINATE PLUMBING ROUGH-IN ACCORDINGLY.

DRAIN AND SPECIALTIES SCHEDULE			
MARK	DESCRIPTION	MANUFACTURER & MODEL NUMBER	NOTES
TD-1	FINISHED AREA TRENCH DRAIN	ZURN Z-880-SOG	PREFABRICATED TRENCH DRAIN.
TD-2	STAINLESS STEEL LINEAR SHOWER DRAIN	ZURN ZS880	PREFABRICATED LINEAR SHOWER DRAIN.
FD-1	FINISHED AREA FLOOR DRAIN	ZURN ZN-415-6B-P, WITH Z-1000 DEEP SEAL TRAP, Z-1035 STABILIZER	6" ROUND NICKLE BRONZE TOP, TRAP PRIMER CONNECTION, CLAMPING COLLAR
FPHB-1	EXTERIOR HOSE BIBB - NON FREEZE - SELF DRAINING	ZURN Z1310-34UN	STAINLESS STEEL PLATE, 3/4" 90 DEGREE INLET WITH UNION, LOOSE KEY HANDLE, COMPRESSION WASHER
TP-1	TRAP PRIMER - PRESSURE DIFFERENTIAL TYPE	ZURN Z1022-DU2-DU4	PROVIDE MULTIPLE OUTLET DISTRIBUTION AS REQUIRED

MIXING VALVE SCHEDULE					
MARK	DESCRIPTION	LOCATION	MANUFACTURER & MODEL NUMBER	OPTIONS/NOTES	LOAD RANGE
MV-1	120 DEG TO 105 DEG FOR PUBLIC LAVATORIES	UNDER PUBLIC LAVATORIES	BRADLEY VERNATHERM MODEL #S59-4008	ADJUSTABLE SET POINT, INTEGRAL STRAINERS ON SUPPLY INLET, BRONZE FINISH, MOUNTING BRACKET, PROVIDED IN ACCESS PANEL	2.5 GPM AT 5 PSI

PUMP SCHEDULE								
MARK	DESCRIPTION	MANUFACTURER & MODEL NO.	LOCATION	FLOW RATE	HEAD PRESSURE	POWER	VOLTAGE	NOTES/ACCESSORIES
CP-1	140 DEGREE CIRCULATION PUMP	BELL & GOSSETT MODEL # NRF-22	MECHANICAL ROOM	2 GPM	7 FEET	92 WATTS 0.60 AMPS	120 VOLT 1 PHASE	BRONZE CONSTRUCTION, 24 HR TIME CLOCK, CIRCUIT SETTER BALANCING VALVE, TC-1 TIMER KIT, PILOT LIGHT SWITCH
SP-1	SUBMERSIBLE SEWAGE DUPLEX PUMPS	LIBERTY PUMPS # 1100-LEH100	BASEMENT	200 GPM	12 FEET	1HP	230 VOLT 3 PHASE	NEMA 4X ENCLOSURE, STAINLESS STEEL SENSOR PROBE, ALARMS, LIGHTS, SILENCE SWITCH, HIGH LIQUID AND HIGH AMPERAGE CONDITIONS COORDINATE LOCATION OF CONTROLS WITH BUILDING OWNER.BASIN'S DIMENSIONS: D=35", H=38"

WATER HEATER SCHEDULE										
DESIGNATION	DESCRIPTION	MANUFACTURER & MODEL NO.	LOCATION	STORAGE VOLUME	GPH RECOVERY AT 100 DEG. F RISE	GAS INPUT IN BTUH	VOLTAGE/ PHASE	EFFICIENCY	FLUE SIZE	NOTES
WH-1	GAS WATER HEATER	BRADFORD WHITE/ LC2PV50H763N	MECHANICAL ROOM	50 GALLONS	82	76000	115 VOLT 1 PHASE	99.1%	4"	1,2,3,4,5,6

- REMARKS:
1. PROVIDE EXPANSION TANK. REFER TO EXPANSION TANK SCHEDULE ON THIS DRAWING.
 2. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER INSTALLATION REQUIREMENTS.
 3. PROVIDE DRAIN PAN WITH 2" ANNULAR CLEARANCE AROUND TANK WITH WATER HEATER INSTALLATION.
 4. ROUTE T&P RELIEF AND DRAIN PAN DRAIN TO DISCHARGE VIA AIR GAP TO FLOOR DRAIN.
 5. DISCONNECTS BY PLUMBING CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR.
 6. REFER TO DETAIL #1 ON P301 FOR ADDITIONAL INFORMATION.

EXPANSION TANK SCHEDULE						
MARK	DESCRIPTION	MANUFACTURER & MODEL NUMBER (BASIS OF DESIGN)	LOCATION	TANK SIZE	ACCEPTANCE VOLUME	NOTES
ET-1	DOMESTIC WATER EXPANSION TANK	AMTROL ST-8	STOR./MECHANICAL ROOM	3.2 GALLONS	1.9 GALLONS	1, 2, 3

- NOTES:
1. WORKING PRESSURE - 150 PSIG. SET TANK PRESSURE TO COORDINATE WITH SYSTEM PRESSURE. FOLLOW MANUFACTURER
INSTRUCTIONS.
 2. MAXIMUM SYSTEM TEMPERATURE - 140 DEG F.
 3. ACCEPTABLE MANUFACTURERS - AMTROL; WESSELS; WATTS

CLEANOUT SCHEDULE				
MARK	DESCRIPTION	MANUFACTURER & MODEL NUMBER	NOTES	OPTIONS
FCO	FLOOR CLEANOUT	ZURN ZN-1400-BP-VP	FULL SIZE OF PIPE, VANDAL-PROOF, NICKEL-BRONZE TOP	- CF FOR CARPET -X FOR TILE
WCO	FLOOR CLEANOUT	ZURN Z-1446-VP	STAINLESS STEEL ACCESS COVER, VANDAL-PROOF, FULL SIZE OF PIPE.	-X FOR TILE

BACKFLOW PREVENTER SCHEDULE				
MARK	DESCRIPTION	MANUFACTURER & MODEL NUMBER	LOCATION	NOTES
BP-1	BACKFLOW PREVENTOR ASSE-1015	WATTS 007M2-QT-1 1/2"	WATER HEATER	1

- NOTES:
1. PROVIDE AIR GAP FITTING. ROUTE DRAIN TO AN APPROVED WASTE RECEPTOR.

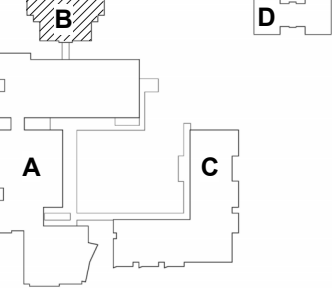
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Key Plan

PLUMBING
SCHEDULES

P401-B

