

LEGEND

NOTE: ALL SYMBOLS SHOWN MAY NOT APPEAR ON DRAWINGS.

SYM.	ABBR.	IDENTIFICATION	SYM.	ABBR.	IDENTIFICATION
---	CW	COLD WATER PIPING		TR	THERMOMETER
---	HW	HOT WATER PIPING		PG	PRESSURE GAUGE
---	HWR	HOT WATER RETURN PIPING		HB	HOSE BIBB
---	NP	NON-POTABLE WATER PIPING		RD	ROOF DRAIN
---	SFT	SOFT WATER PIPING		OF	OVERFLOW DRAIN
---	SA	SANITARY SEWER PIPING		FD	FLOOR DRAIN
---	ST	STORM PIPING		SD	SITE DRAIN
---	OF	OVERFLOW CONDUCTOR PIPING		H.O.	HUB OUTLET
---	V	VENT PIPING		X	FIXTURE UNIT (WATER SUPPLY OR WASTE)
VTR		VENT THRU ROOF		IE	INVERT ELEVATION
---	G	GAS PIPING		EL	ELEVATION
---	A	AIR PIPING		RI	ROUGH IN
---	V	VACUUM PIPING			EQUIPMENT BY OTHERS, PLUMBING CONNECTION BY PLUMBING CONTRACTOR
CO		CLEAN OUT			CONNECT TO EXISTING PIPING
WCO		WALL CLEAN OUT	---		REMOVE EXISTING
FCO		FLOOR CLEAN OUT (FLUSH)	---		
BFP		BACKFLOW PREVENTER	---		
PRV		PRESSURE REDUCING VALVE	---		
		SHUTOFF VALVE	---		
		BALANCE VALVE	---		
		CHECK VALVE	---		
WHA		WATER HAMMER ARRESTOR	---		
		TEST CONNECTION	---		
		PIPING CAP	---		
		UNION	---		

SERVICE	APPLICATION	PIPE MATERIAL	PIPE STANDARD	FITTINGS	JOINTS
WATER	ABOVE GROUND INSIDE BUILDING	COPPER	ASTM B42, B88 TYPE L HARD DRAWN ASTM F876 ASTM F877 NSF P171 CL-R	ANSI B16.15, B16.18, B16.22, B16.23, B16.26 B16.29, B16.32	LEAD FREE SOLDER
	UNDERGROUND INSIDE BUILDING	COPPER	ASTM B42, B88 TYPE K ANNEALED TUBING	ANSI B16.15, B16.18, B16.22, B16.23, B16.26 B16.29, B16.32	AWS A5.8 BCP SILVER BRAZE (1)
SAN. SEWER, DRAIN, WASTE AND VENT	ABOVE GROUND INSIDE BUILDING	PEX	ASTM F876 ASTM F877 ASTM F2023	ASTM F1807	PER MFR REQUIREMENTS
	UNDERGROUND INSIDE BUILDING	COPPER	ASTM B42, B88 TYPE K ANNEALED TUBING	ANSI B16.15, B16.18, B16.22, B16.23, B16.26 B16.29, B16.32	AWS A5.8 BCP SILVER BRAZE (1)
GAS	ABOVE GROUND INSIDE BUILDING	PVC	ASTM D1785, D2665 DWV	PVC ASTM D2966, F1869	ASTM F856 SOLVENT WELD WITH ASTM D2654 SOLVENT CEMENT
	UNDERGROUND INSIDE BUILDING	HUBLESS CAST IRON	ASTM A889, C151P 301, SERVICE WEIGHT	CAST IRON ASTM B16.1, B16.4, B16.12	C151P 310 S.S. CLAMP & SHIELD W/ASTM C564 RUBBER SEALING SLEEVE. HWY DUTY FOR SIZES 2"
AIR	ABOVE GROUND INSIDE BLDG	BLACK STEEL	ASTM A53, GRADE B TYPE E OR S, SCHEDULE 40	ANSI B16.3 MILL FINISH ASST 152 THREADED	WELDED
	UNDERGROUND INSIDE BUILDING	COPPER	ASTM B88 TYPE L HARD DRAWN	ANSI B16.3 COPPER AND BRONZE GRADE B17 SOLDER	WELDED
VACUUM	ABOVE GROUND INSIDE BUILDING	COPPER	ASTM B88 TYPE K ANNEALED TUBING	ANSI B16.3 COPPER AND BRONZE GRADE B17 SOLDER	AWS A5.8 BCP SILVER BRAZE (1)
	INSIDE BLDG	PVC	ASTM D1785, D2665 SCHEDULE 40	PVC ASTM D2966, F1869	ASTM F856 SOLVENT WELD WITH ASTM D2654 SOLVENT CEMENT

1. WHERE MULTIPLE PIPE MATERIALS ARE LISTED, CONTRACTOR TO CHOOSE FROM APPROVED, UNLESS DRAWINGS SPECIFICALLY INDICATE PIPE MATERIAL.
 (*) NO JOINTS PERMITTED UNDERGROUND.
 (2) PROVIDE PRESSURIZED DEEP SOCKET LONG SWEEP AND WYE TYPE, W/STERN FINISHES. NO SHORT SWEEPS OR TEES PERMITTED.

SERVICE	LOCATION	INSULATION THICKNESS & TYPE	INSULATION JACKET
COLD WATER	GENERAL BUILDING	1/2" RIGID F.G. OR CLOSED CELL (1) (10)	NR
HOT WATER	IN WALLS	1/2" CLOSED CELL (10)	NR
COPPER (PEX)	ALL	NR	NR
H.W. & H.W.R. (COND. LOOP)	GENERAL BUILDING	1" RIGID F.G. OR CLOSED CELL (10)	NR
H.W. BRANCH NOT ON COND. LOOP	GENERAL BUILDING	1/2" RIGID F.G. OR CLOSED CELL (10)	NR
H.W.	IN WALLS	1/2" CLOSED CELL	NR

NR = NOT REQUIRED
 INSULATION NOTES
 (1) INSULATE METERS, VALVES, BACKFLOW PREVENTERS AND ALL IN-LINE EQUIPMENT.
 (10) INSULATION NOT REQUIRED FOR EXPOSED FINAL PIPING CONNECTIONS TO FIXTURES.

PLUMBING SPECIFICATIONS

I. BASIC PLUMBING REQUIREMENTS

A. SEE SHEET T2.0.

B. SUBSTITUTIONS: WHERE SUBSTITUTE EQUIPMENT REQUIRES REDESIGN OF ANY PART OF THE PROJECT, THE COST OF REDESIGN AND ADDITIONAL COSTS OF THE WORK SHALL BE PAID BY THE CONTRACTOR. REDESIGN SHALL BE SUBJECT TO THE APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION OVER THE WORK INCLUDING THE ARCHITECT/ENGINEER.

C. PLUMBING CONTRACTOR SHALL VERIFY REQUIREMENTS FOR TEMPORARY WATER WITH GENERAL CONTRACTOR AND INCLUDE IN HIS SCOPE OF WORK WHEN DIRECTED BY G.C. INSTALL IN ACCORDANCE WITH ALL CODE AND OSHA REQUIREMENTS FOR CONSTRUCTION PROJECTS.

D. DETAILS AND SCHEDULES ARE SHOWN TO AID THE CONTRACTOR AND ARE NOT MEANT TO BE INCLUSIVE OF ALL DEVICES. PROVIDE REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

E. PROVIDE ALL STATE AND LOCAL PERMITS AND ANY OTHER RELATED FEES.

F. REGULATORY REQUIREMENTS

- PROVIDE CERTIFICATE OF COMPLIANCE FROM AUTHORITY HAVING JURISDICTION INDICATING APPROVAL BACKFLOW PREVENTION DEVICES INSTALLATION.
- PERFORM WORK PER ALL LOCAL AND STATE CODES, ORDINANCES AND REGULATIONS HAVING JURISDICTION.

G. COORDINATE INSTALLATION OF PLUMBING WORK WITH THE OTHER CONTRACTORS AND THE EXISTING BUILDING TO AVOID CONFLICTS WITH OTHER WORK.

H. VERIFY CONNECTION REQUIREMENTS FOR EQUIPMENT FURNISHED BY OTHERS WITH FINAL SHOP DRAWINGS.

I. PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR PLUMBING WORK INSTALLATION UNLESS THIS WORK IS IDENTIFIED TO BE THE WORK OF OTHER CONTRACTORS. PATCHING SHALL MATCH ADJACENT SURFACES.

J. P.C. SHALL PROVIDE SAWCUTTING, EXCAVATION, AND BACKFILL OF EXISTING FLOORS AS REQUIRED FOR INSTALLATION OF NEW UNDERGROUND PIPING. P.C. SHALL PROVIDE CONCRETE IN REMOVED AREA OF THICKNESS TO MATCH EXISTING, AND WITH REINFORCING PER FLOOR SLAB SPECIFICATIONS. PROVIDE DOWELS INTO EXISTING FLOOR SLAB. DOWEL DIAMETER SHALL BE MINIMUM ONE EIGHTH OF FLOOR SLAB THICKNESS. DOWEL LENGTH SHALL BE 12" FOR SLABS LESS THAN 6" THICK, 16" FOR SLABS 6-7" THICK, 18" FOR SLABS 8-9" THICK, AND 20" FOR SLABS GREATER THAN 9" THICK. DOWELS SHALL BE SPACED 12" O.C.

K. FIRE RATED INTERIOR WALL AND FLOOR PIPE PENETRATIONS

- SLEEVE REQUIRED FOR PENETRATION OF CONCRETE AND MASONRY WALLS AND FLOORS.
- SEAL OPENING AROUND PIPE WITH A UL APPROVED FIRE-STOP SYSTEM HAVING AN F-RATING NOT LESS THAN THE HOURLY RATING OF THE ASSEMBLY BEING PENETRATED
- WHERE A SLEEVE IS REQUIRED, FURNISH AND INSTALL SLEEVES FOR NEW DRYWALL WALLS AND CONCRETE WALLS AND FLOORS. FURNISH SLEEVES TO THE MASON CONTRACTOR FOR INSTALLATION IN NEW MASONRY WALLS. PROVIDE SLEEVE AND GROUT SLEEVE IN EXISTING MASONRY WALLS.

L. PROJECT COMPLETION

- CLEAN FIXTURES AND EQUIPMENT AND LEAVE IN PROPER WORKING CONDITION AT THE TIME OF FINAL CLEAN-UP.
- REMOVE, CLEAN AND REPLACE AERATORS AFTER FLUSHING WATER PIPING.
- AS-BUILT DRAWINGS SHALL BE MARKED ON A FINAL SET OF DRAWINGS WHICH INCLUDES ALL REVISIONS.

M. ACCESS

- FURNISH ACCESS PANELS OF ADEQUATE SIZE TO PERMIT SERVICE OF EQUIPMENT, VALVES, OR OTHER SPECIALTIES WHICH REQUIRE MAINTENANCE OR ADJUSTMENT WHICH ARE INSTALLED BEHIND WALLS OR ABOVE CEILING SURFACES.
- PANELS SHALL BE SUITABLE FOR INSTALLATION IN THE MATERIAL FORMING THE FINISHED SURFACE, WITH FLUSH METAL FRAME, FLUSH HINGED STEEL DOOR, FLUSH SCREWDRIWER OPERATED LATCH.
- PANELS UL LISTED TO CONFORM TO THE FIRE RATING OF THE SURFACE INSTALLED IN.
- TURN ACCESS PANEL OVER TO CONTRACTOR SKILLED IN THE CONSTRUCTION OF THE SURFACES INVOLVED FOR INSTALLATION.
- ARCHITECT TO APPROVE ACCESS PANEL LOCATION PRIOR TO INSTALLATION OF EQUIPMENT REQUIRING ACCESS.
- COORDINATE WITH THE OTHER CONTRACTORS AND WHEREVER PRACTICAL, GROUP DEVICES IN SUCH A MANNER SO AS TO MINIMIZE PANELS.

II. FINISH AND PAINTING

A. COORDINATE WORK WITH THE PAINTERS SO THAT ALL EQUIPMENT IS INSTALLED PRIOR TO PAINTING. SHALL PAINT ITEMS IF NOT IN PLACE PRIOR TO NORMAL ROUTINE PAINTING.

B. IF FINISH BECOMES RUSTED, CORRODED, SCRATCHED, OR FLAKED DURING STORAGE OR INSTALLATION, REFRESH THE EQUIPMENT TO THE SATISFACTION OF THE OWNER.

C. WHERE THE PLUMBING CONTRACTOR IS REQUIRED TO PAINT, THE PAINTING SHALL BE DONE IN ACCORDANCE WITH THE PAINTING PORTION OF THE ARCHITECTURAL SPECIFICATIONS.

III. PIPE AND EQUIPMENT HANGERS AND SUPPORTS

A. MANUFACTURERS: B-LINE, EMPIRE INDUSTRIES, GLOBAL PIPE HANGER PRODUCTS, GRINNELL, NATIONAL PIPE HANGER, UNI STRUT.

B. SEE SCHEDULE ON PLANS FOR HANGER SPACING.

C. CONFORM TO ASME B31.9 AND MANUFACTURERS STANDARDIZATION SOCIETY (MSS) SP-58-2009.

D. ANGLES, CHANNELS, AND BEAMS: ASTM A36 AND A307 AS REQUIRED.

E. PIPE HANGERS/SUPPORTS MATERIALS

- THREADED ROD: MILL STEEL, BLACK OIL FINISH PLATED FINISH.
- ADJUSTABLE SWIVE SPRING MSS SP-58 TYPE 10, B-LINE FIGURE B3170
- LIGHT DUTY CLEVIS: MSS SP-58 TYPE 1, B-LINE FIGURE B3104
- STANDARD CLEVIS: MSS SP-58 TYPE 1, B-LINE FIGURE B3100
- INSULATION PROTECTION SHIELDS: MSS SP-40, B-LINE FIGURE B3151.
- V. BOTTOM CLEVIS HANGER: MSS SP-58 TYPE 1, B-LINE FIGURE B3106 AND FIGURE B3107
- PRE-GALVANIZED PLASTIC PIPE: 2" CHANNEL FOR PEX PIPING TO INCREASE HANGER SPACING.

F. INSULATED SUPPORTS

- B-LINE FIGURE B335* W/UL REPELLENT TREATED TYPE 1 CALCIUM SILICATE INSULATION WITH PRE-GALVANIZED STEEL WALL OR TOP OR BOTTOM CELLULAR GLASS, INSULATION THICKNESS SAME AS PIPE INSULATION.
- COLD PIPING: INSERT WITH A VAPOR BARRIER, EXTEND INSERT 2" BEYOND STEEL JACKET.
- INSERT AND SHIELD SHALL COVER ENTIRE CIRCUMFERENCE OF PIPE FOR TRAPEZOID OR CLAMPED INSERTS FOR INSULATED PIPING (UNLESS SPECIFIED OTHERWISE)
- HANGER SIZE SHALL BE PIPE SIZE OR OVERSIZED FOR INSULATION
- HANGERS IN CONTACT WITH COPPER PIPING SHALL BE COPPER OR PLASTIC COATED OR SHALL BE OVERSIZED FOR INSULATION TO BE CONTINUOUS THRU HANGER.
- PROVIDE INSULATION PROTECTION SHIELDS OR PRE-INSULATED SUPPORT WHEN OVERSIZED HANGERS ARE USED.
- IF OVERSIZED HANGERS ARE NOT USED, INSULATION SHALL COVER ALL PORTIONS OF THE PIPE AND THE HANGER.

G. HANGERS FOR PLASTIC PIPING SHALL BE FREE OF ROUGH OR SHARP EDGES THAT COULD DAMAGE PIPE. H. INSTALL ADDITIONAL HANGER WITHIN 12" OF ELBOWS AND TEES.

I. INSTALL ADDITIONAL ATTACHMENTS AT CONCENTRATED LOADS, INCLUDING VALVES, FLANGES, AND STRAINERS NPS 2-1/2" AND LARGER.

J. INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADS AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT. ADJUST HANGERS TO DISTRIBUTE LOADS EQUALLY ON ATTACHMENTS AND TO PROVIDE INDICATED PIPE SLOPES.

K. STRUT SYSTEM

- COMPLY WITH THE LATEST REVISION OF MFMA STANDARDS PUBLICATION NUMBER MFMA-3, "METAL FRAMING STANDARDS PUBLICATION".
- INSTALL STRUT IN ACCORDANCE WITH MFMA-102 "GUIDELINES FOR THE USE OF METAL FRAMING"; IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS RECOMMENDATIONS, AND WITH RECOGNIZED INDUSTRY PRACTICES.
- COLD FORMED LOW CARBON STEEL METAL FRAMING CHANNEL STRUT: B-LINE TYPE B CHANNEL.
- MANUFACTURER'S STANDARD FINISH OR PLAIN FINISH UNLESS INSTALLED OUTDOORS, OR IN WET LOCATIONS.
- 1-68 INCHES WIDE IN VARYING HEIGHTS AND WELDED COMBINATIONS AS REQUIRED TO MEET LOAD CAPACITIES.
- PIPE CLAMP: B-LINE B2000 SERIES. ALL PIPES SHALL BE CLAMPED TO THE STRUT.
- INSULATION SHALL BE CONTINUOUS THRU STRUT PIPE CLAMPS, PROVIDE PRE-INSULATED SUPPORT OR INSULATION PROTECTION SHIELD AND PIPE CLAMP SIZED FOR INSULATION O.D..

IV. MECHANICAL IDENTIFICATION

A. NAMEPLATES

- MANUFACTURERS: W.H. BRADY, AND SETON NAME PLATE COMPANY.
- 3/4" HIGH, 1/16" THICK PLASTIC WITH ENGRAVED WHITE LETTERS ON BLACK BACKGROUND COLOR, SCREW OR ADHESIVE MOUNTING.
- PROVIDE AT CONTROL PANELS, STARTERS, MAJOR CONTROL COMPONENTS OUTSIDE PANELS, AND WATER TREATMENT DEVICES.

B. VALVE TAGS

1. MANUFACTURERS: W.H. BRADY, AND SETON NAME PLATE COMPANY.

2. PLASTIC TAGS: 1-1/2" DIAMETER, 1/16" THICK LAMINATE PLASTIC WITH ENGRAVED LETTERS.

3. TYPEWRITTEN LETTER SIZE CHART.

4. PROVIDE AT MAIN AND BRANCH PIPING VALVES. DRAIN VALVES DO NOT HAVE TO BE TAGGED. FIXTURE STOPS SHALL NOT BE TAGGED.

C. SIGNAGE

- MANUFACTURERS: W.H. BRADY, MY SAFETY SIGN AND SETON NAME PLATE COMPANY.
- PLASTIC SIGN: MIN 4" WIDE X 2" HIGH, 1/16" THICK LAMINATE PLASTIC WITH ENGRAVED LETTERS. TWO HOLES PUNCHED, WITH VALVE CHAIN. WHITE BACKGROUND W/ RED LETTERS.
- PROVIDE AT MAIN WATER SHUTOFF VALVE IN MECHICAL ROOM FOR ASPEN DENTAL.

D. PIPE IDENTIFICATION

- PROVIDE AT CONCEALED AND EXPOSED PIPING. IDENTIFY PIPE SERVICE AND FLOW DIRECTION.
- LOCATE IDENTIFICATION NOT TO EXCEED 25 FEET FOR PIPING ABOVE CEILINGS.
- LOCATE IDENTIFICATION NOT TO EXCEED 60 FEET FOR EXPOSED PIPING. MINIMUM ONE LOCATION PER ROOM.
- LABEL PIPING DOWNSTREAM OF BACKFLOW PREVENTERS FOR INTENDED USE.
- STENCILS: 2" HIGH LETTERS, SEMI-GLOSS ENAMEL BLACK PAINT.
- PIPE MARKERS

E. MANUFACTURERS: W.H. BRADY, AND SETON NAMEPLATE COMPANY.

F. FLEXIBLE VINYL FILM TAPE WITH PRESSURE SENSITIVE ADHESIVE BACKING AND PRINTED MARKINGS. SECURE WITH 2" WIDE TAPE WITH ARROWS INDICATING FLOW.

V. INSULATION

A. GENERAL

- INSULATION SYSTEMS SHALL MEET UL-723 REQUIREMENTS OF MAX. FIRE HAZARD CLASSIFICATION OF 25, AND MAX. FLAME SPREAD, FUEL CONTRIBUTED, AND SMOKE DEVELOPED OF 60 WHEN INSTALLED IN RETURN AIR FLENUMS.
- INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND MICA PUBLICATION "COMMERCIAL AND INDUSTRIAL STANDARDS", 1999 FIFTH EDITION.
- INSULATE ENTIRE PIPING SYSTEM INCLUDING VALVES AND FITTINGS PER MICA INSULATION STANDARDS PLATES 10 THRU 18.
- TAPER AND SEAL ALL INSULATION ENDS.
- CONTINUE INSULATION WITHOUT INTERRUPTIONS THROUGH WALLS, SLEEVES, AND HANGERS.

B. FIBERGLASS (F.G.) INSULATION

- MANUFACTURERS: OWENS CORNING (O.C.) FIBERGLASS CORPORATION, CERTAINTED, JOHN MANVILLE.
- RIGID PIPING: "K" VALUE 0.24, DOUBLE ADHESIVE SELF-SEALING LAP SYSTEM FOR LONGITUDINAL JOINTS. ALL SERVICE JACKET VAPOR BARRIER COVERINGS. INSULATION SHALL MEET OR EXCEED 154 FLAME SPREAD SMOKE DEVELOPED INDEX OF 25/60.
- VALVES, FITTINGS, AND FLANGE COVERS: HIGH IMPACT WHITE PVC, 0.02" THICK, PRECUT FIBERGLASS INSERTS.

C. CLOSED CELL INSULATION

- MANUFACTURERS: ARMSTRONG, IMCOA, AND RUBBER.
- ELASTOMERIC MATERIAL, "K" VALUE 0.27, 6 LB./CU. FT., MAXIMUM TEMPERATURE 180 DEGS. SYNTHETIC RUBBER BASE ADHESIVE WITH SYNTHETIC RESINS AND FILLS. INSULATION SHALL MEET OR EXCEED 154 FLAME SPREAD SMOKE DEVELOPED INDEX OF 25/60.

VI. EXCAVATION AND BACKFILL

A. EXCAVATING

- P.C. SHALL EXCAVATE AND BACKFILL TRENCHES FOR PLUMBING WORK.
- BRACE OR SHIELD ALL EXCAVATIONS AND PUMP ALL WATER WHERE REQUIRED TO PREVENT CAVING.
- EXCAVATE TO MIN 4" BELOW FINISH GRADE IF STONE GREATER THAN 1" IS ENCOUNTERED.
- REMOVE UNSTABLE AREAS OF SUBGRADE BELOW PIPE TO MINIMUM 24" BELOW PIPE. BACKFILL WITH PER GRAVEL LIME STABILIZED SCREENING OR EQUIVALENT AND COMPACT TO DENSITY EQUAL TO REQUIREMENTS FOR ROADWAY SUBGRADE BACKFILL MATERIAL.
- BACKFILL AND COMPACTION SHALL MEET REQUIREMENTS SPECIFIED ELSEWHERE FOR AREA OF EXCAVATION.

B. PIPING INSTALLATION

- FIELD VERIFY EXISTING SEWER ELEVATIONS AND SIZES BEFORE BEGINNING BUILDING ROUGH-IN AND NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING OF ANY VARIATION OF THE ELEVATIONS BEFORE BEGINNING ANY SEWER AND BUILDING DRAIN WORK.
- DRAWINGS AND DIAGRAMS SHOW SIZE AND APPROXIMATE LOCATION OF PIPING. THE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. PROVIDE ADDITIONAL OFFSETS TO COORDINATE WITH INSTALLATION REQUIREMENTS OF OTHER SYSTEMS. ROUTE PIPING IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE. OFFSET PIPE CONNECTIONS AT EQUIPMENT TO ALLOW FOR SERVICE, SUCH AS REMOVAL OF THE EQUIPMENT.
- PREPARE EXPOSED UNFINISHED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING.
- CAP ALL PIPE OPENINGS DURING CONSTRUCTION TO PREVENT FOREIGN MATTER FROM ENTERING THE PIPE. ALL PIPING SHALL BE FULLY CLEANED IN STRICT ACCORDANCE WITH INDUSTRY STANDARDS.
- PROTECT COPPER AND PLASTIC PIPE IN STUD WALLS WITH MINIMUM 1/16" SHIELD PLATES EXTENDING BEYOND THE PIPE IN ALL DIRECTIONS.
- REVIEW CONNECTION REQUIREMENTS OF ACTUAL EQUIPMENT FURNISHED PRIOR TO ROUGH-IN. ADJUST ROUGH-IN TO MEET EQUIPMENT INSTALLATION REQUIREMENTS.
- RUN ALL DRAIN LINES FROM EQUIPMENT OVERFLOW RECEIVERS, ETC. TO FLOOR / HUB DRAINS. DRAIN LINES SHALL BE HARD DRAWN COPPER INSTALLED WITH A MINIMUM OF 1/8" PER FOOT SLOPE. NO DRAIN LINE SHALL BE SMALLER THAN 1/2". INSTALL A TEE AT EACH ELBOW OF CONDENSATE DRAIN PIPING WITH A CLEANOUT PLUG ON THE BLIND TEE.
- INSTALL IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINING DISSIMILAR METALS.
- PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
- SLOPE SANITARY PIPE 2" AND SMALLER 1/4" PER FOOT; 2-1/2" AND LARGER PIPING 1/8" PER FOOT.
- PIPING INSTALLED IN EXTERIOR WALLS SHALL BE INSTALLED ON THE ROOM SIDE OF EXTERIOR WALL INSULATION AND ONLY WHEN APPROVED BY THE ENGINEER. WHEREVER POSSIBLE, AVOID ROUTING DOMESTIC WATER SUPPLY PIPING IN EXTERIOR WALLS.

B. WATER PIPING TESTING AND BALANCING

- TEST WATER DISTRIBUTION SYSTEM UNDER A WATER PRESSURE OF 100-PSI GAUGE WITH POTABLE WATER FOR A PERIOD OF (4) HOURS.
- FLUSH ALL NEW PIPING AND VERIFY THAT SUFFICIENT WATER FLOW, PRESSURE AND TEMPERATURE ARE AVAILABLE AT EACH OUTLET AND EQUIPMENT CONNECTION.
- BALANCE CIRCULATING HOT WATER SYSTEM TO INSURE PROPER CIRCULATION OF HOT WATER IN THE SYSTEM WITH HOT WATER AVAILABLE TO ALL FIXTURES AND CONNECTIONS.

C. DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- FLUSH AND DISINFECT WATER SUPPLY SYSTEM IN ACCORDANCE WITH APPLICABLE STATE PLUMBING CODE.

D. WATER SYSTEM VALVES

- MANUFACTURERS: NIBCO, APOLLO, HAMMOND, MILWAUKEE, KEYSTONE, CENTERLINE, DEZURIK, CRANE, MUELLER, POWELL, AND GRINNELL.
- BALL VALVES 2" AND SMALLER: NIBCO MODEL S-FP-600A, CHROME PLATED BRASS BALL, TWO PIECE BRONZE BODY, FULL PORT, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE WITH BALANCING STOPS AND VALVE STEM EXTENSIONS FOR INSULATED PIPING, SOLDER ENDS, 600 PSI WOG, NSF 61 LISTED.
- BALL VALVES 1" AND SMALLER (PEX): APOLLO 77X SERIES, BRONZE THREE PIECE BODY, CHROME PLATED BRASS BALL, FULL PORT, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE WITH VALVE EXTENSIONS FOR INSULATED PIPING, CRIMP JOINT ENDS, 200 PSI WOG, NSF 61 LISTED.
- BALANCE VALVES 2" AND SMALLER (MANUFACTURERS: BELL & GOSSETT A-58LFFPC), NIBCO, FLOWSET, ARMSTRONGS, AND TOUR AND ANDERSON). BRONZE BODY WITH CALIBRATED BRASS ORIFICE OR VENTURI, MEMORY STOP, SOLDERED ENDS AND PRESSURE TAPS. 125 PSIG RATING AT 240 DEG F. NSF 61 ANNEX G LISTED LEAD FREE.
- DRAIN VALVES: SHUTOFF VALVES WITH THREADED HOSE ADAPTER, CAP, AND CHAIN. PROVIDE FOR COMPLETE SYSTEM DRAINAGE, AND WHERE DETAILED. NSF 61 LISTED.
- SPRING LOADED CHECK VALVES 2" AND SMALLER: NIBCO MODEL 489-LF, BRONZE BODY, TFE SEAT AND DISC, STAINLESS STEEL SPRING, THREADED ENDS, CLASS 125, NSF 61 ANNEX G LISTED LEAD FREE.
- SPRING LOADED CHECK VALVES 2-1/2" AND LARGER: NIBCO MODEL 910-LF, CAST IRON BODY, BRONZE DISC, BRONZE TRIM, BRONZE OR EDM SEAT, STAINLESS STEEL SPRING, CLASS 125, NSF 61 ANNEX G LISTED LEAD FREE.
- INSTALL VALVE STEM BETWEEN THE VERTICAL (UPRIGHT) OR HORIZONTAL POSITION.
- DO NOT SUPPORT WEIGHT OF PIPING ON VALVE.

VII. PLUMBING SPECIALTIES

A. PRESSURE GAUGES AND THERMOMETERS

- MANUFACTURERS: H.O. TRIMBLE, U.S. GAUGE, ASHCROFT, MARSH, WEISS, AND WELSLER.

2. PRESSURE GAUGES: CAST ALUMINUM CASE, PHOSPHOR BRONZE BOURNOM TUBE, GLYCERINE LIQUID FILLED, 4-1/2" DIAMETER, GAUGE COCK AND PULSATION DAMPER. 0-100 PSIG SCALE RANGE, 1 PSIG MINIMUM INCREMENT.

3. STEM THERMOMETERS: ASTM E1, RED APPEARING MERCURY, CAST ALUMINUM CASE WITH ENAMEL FINISH, CAST ALUMINUM ADJUSTABLE JOINT WITH POSITIVE LOCKING DEVICE, 9" SCALE, 3/4" NPT BRASS STEM, STEMS WITH EXTENSIONS AS REQUIRED FOR INSULATION. 30-240 DEG. F. SCALE RANGE, 2 DEG F. MINIMUM INCREMENTS.

4. EXTEND NIPPLES AND SYNPHONS TO ALLOW INSULATION CLEARANCE.

5. INSTALL WHERE READ FROM NORMAL OPERATING LEVEL.

6. CALIBRATE FOR ACCURACY.

B. WATER HAMMER ARRESTORS

- MANUFACTURERS: PRECISION PLUMBING PRODUCTS, SIOUX CHIEF, WATTS.
- ANSI A112.26.1, SIZED IN ACCORDANCE WITH PDI STANDARD WH-201.
- INSTALL WITH ACCESSIBLE ISOLATION VALVE.

C. AIR ADMITTANCE VALVES NOT PERMITTED.

IX. PLUMBING FIXTURES

A. FIXTURES

- LIKE FIXTURES SHALL BE THE PRODUCT OF THE SAME MANUFACTURER.
- SAFETY COVERS OVER EXPOSED WASTE AND SUPPLY PIPING AT AN ACCESSIBLE POINT SHALL BE LA-V-GUARD BY TRUEBRO OR EQUIVALENT.

B. INSTALLATION

- INSTALL IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- PROVIDE CHROME FINISHED RIGID SUPPLY FIXTURES WITH STOPS, REDUCERS, AND ESCUTCHEONS.
- SEAL FIXTURES TO WALL AND FLOOR SURFACES WITH MILDEW RESISTANT SILICONE SEALANT, COLOR TO MATCH FIXTURE.
- REVIEW ARCHITECTURAL DRAWINGS FOR ELEVATION AND DIMENSIONED LOCATIONS OF PLUMBING FIXTURES. FIXTURES DESIGNED FOR RE-ADAP USE SHALL BE INSTALLED TO MEET THE MOST CURRENT APPLICABLE ADA REGULATIONS AND ACCESS REQUIREMENTS FOR CLEARANCE AND ACCESS.
- EXPOSED TRAPS, PIPING, AND FITTINGS SHALL BE CHROME PLATED BRASS.

X. COMPRESSED AIR PIPING

A. PIPING INSTALLATION

- DRAWINGS AND DIAGRAMS SHOW SIZE AND APPROXIMATE LOCATION OF PIPING. THE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. PROVIDE ADDITIONAL OFFSETS TO COORDINATE WITH INSTALLATION REQUIREMENTS OF OTHER SYSTEMS. ROUTE PIPING IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE. OFFSET PIPE CONNECTIONS AT EQUIPMENT TO ALLOW FOR SERVICE, SUCH AS REMOVAL OF THE EQUIPMENT.
- PREPARE EXPOSED UNFINISHED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING.
- INSTALL IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINING DISSIMILAR METALS.
- PROVIDE CLEARANCE FOR ACCESS TO VALVES AND FITTINGS.
- ALL TAKEOFFS SHALL BE FROM THE TOP OF THE PIPING.
- INSTALL VALVE STEM BETWEEN THE VERTICAL (UPRIGHT) OR HORIZONTAL POSITION.
- DO NOT SUPPORT WEIGHT OF PIPING ON VALVE.

B. UNIONS AND FLANGES

- COPPER PIPE 2" AND SMALLER: BRONZE, SOLDERED JOINTS.

C. VALVES

- MANUFACTURERS: NIBCO, APOLLO, HAMMOND, MILWAUKEE, KEYSTONE, CENTERLINE, DEZURIK, CRANE, MUELLER, POWELL, AND GRINNELL.
- BALL VALVES 2" AND SMALLER (MAIN PIPING): NIBCO MODEL T-585-70, CHROME PLATED BRASS BALL, TWO PIECE BRONZE BODY, FULL PORT, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, THREADED ENDS, 600 PSI WOG.
- BALL VALVES 1" AND SMALLER (BRANCH PIPING TO EQUIPMENT): NIBCO MODEL T-585-70-SV, CHROME PLATED BRASS BALL, TWO PIECE BRONZE BODY, FULL PORT, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, THREADED ENDS, SAFETY VENT FOR PRESSURE RELIEF OF DOWNSTREAM PIPING TO EQUIPMENT; 600 PSI WOG.

XI. NATURAL GAS PIPING AND ACCESSORIES

A. COORDINATE INSTALLATION OF GAS SERVICE WITH GAS UTILITY. CONTACT GAS UTILITY TO ARRANGE SERVICE AND ASSIST OWNER IN APPLYING FOR NEW SERVICE.

B. PIPING

- INSTALL, INSPECT, TEST, AND PURGE GAS PIPING IN CONFORMANCE WITH NFPA 54 AND GAS UTILITY COMPANY.
- MAKE BRANCH CONNECTIONS TO THE MAIN FROM THE TOP OR SIDE.
- PAINT EXTERIOR GAS PIPING NOT LOCATED ON THE ROOF WITH TWO (2) COATS RUST RESISTANT PAINT, COLOR TO MATCH ADJACENT SURFACE.

C. GAS VALVES

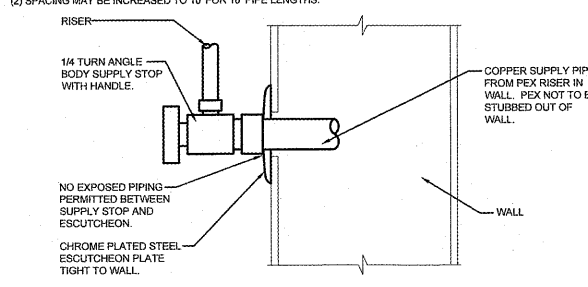
- UL LISTED FOR USE AS NATURAL GAS SHUTOFF.
- BALL VALVES MANUFACTURERS: NIBCO 685-TULL, WATTS 860600L; BRONZE BODY, THREADED ENDS, CHROME PLATED BRASS BALL, FULL PORT, TEFLON SEAT, BLOWOUT-PROOF STEM, TWO-PIECE CONSTRUCTION, 150 PSIG WORKING PRESSURE.
- PLUG VALVES (MANUFACTURERS: DEZURIK PEC, HOMESTEAD SERIES 120): CAST IRON BODY, FLANGED ENDS, BRONZE BEARINGS, ELECTROLESS NICKEL PLATED CAST IRON PLUG WITH HYCAR RESILIENT FULL SEAL, BUNA-N STEM SEAL CALIBRATOR, LEVER ACTUATOR, 175 PSIG WOG.
- PROVIDE A MAIN GAS LINE SHUTOFF VALVE IMMEDIATELY AFTER THE METER CONNECTION.

D. GAS PRESSURE REGULATORS

- CAST IRON BODY, ALUMINUM SPRING CASE, ALUMINUM ORIFICE, BUNA-N DIAPHRAGM, INTERNAL RELIEF VALVE SET TO RELIEVE AT 7-10" W.C. ABOVE NORMAL OUTLET PRESSURE SETTING OF 7" WC., TOPCOAT ENAMEL.
- SENSUS MODELS 456.
- FOR REGULATORS INSTALLED OUTDOORS, PIPE THE RELIEF VALVE VENT SET TO THE OUTSIDE OF THE BUILDING AT A NON-HAZARDOUS LOCATION. INCREASE VENT SIZE ONE PIPE SIZE IF VENT LENGTH EXCEEDS 10 FEET. TERMINATE WITH AN ELBOW DOWN WITH A SCREEN OVER THE OPENING. DO NOT COMBINE VENTS.
- MAXITROL 325 SERIES WITH VENT LIMITER ARE PERMITTED FOR INDOOR APPLICATIONS WHERE SUPPLYING LESS THAN 300,000 BTUH.
- FOR REGULATORS INSTALLED OUTDOORS, POSITION THE REGULATOR SO THE RELIEF VALVE VENT IS FACING DOWN OR INSTALL ELBOW FACING DOWN A MINIMUM 10 FEET FROM AN OUTSIDE AIR INTAKE AND 5 FEET FROM A GAS FLUE DISCHARGE.

PIPE SIZE	STEEL		COPPER		PVC	CAST IRON (2)	PEX	MIN. ROD
	VAPOR	NAT. GAS	MIN. ROD	WATER				
1/4"	1/4"	3/8"	1/4"	1/2"	1/2"	4"	3/4"	3/8"
3/4"	3/4"	1"	3/8"	1/2"	1/2"	4"	3/4"	3/8"
1"	1"	1 1/8"	3/8"	1/2"	1/2"	4"	3/4"	3/8"
1 1/4"	1 1/4"	1 3/8"	7/8"	1"	1"	4"	3/4"	3/8"
1 1/2"	1 1/2"	1 3/8"	1"	1 1/8"	1 1/8"	4"	3/4"	3/8"
2"	2"	2 1/8"	1 1/8"	1 1/4"	1 1/4"	4"	3/4"	3/8"
3"	3"	3 1/8"	1 3/8"	1 3/4"	1 3/4"	4"	3/4"	3/8"
4"	4"	4 1/8"	1 3/4"	2"	2"	4"	3/4"	3/8"
MAX VERT. (1)	15"	10"	-	10"	-	10"	10"	-

(1) SUPPORT AT MINIMUM EVERY FLOOR LEVEL OR SPACING LISTED.
 (2) SPACING MAY BE INCREASED TO 10' FOR 10" PIPE LENGTHS.



ANGLE STOP DETAIL
 NO SCALE

EXCEL