SECTION 15410 - PLUMBING SYSTEMS PIPING SPECIFICATIONS

GENERAL

1. PRINCIPAL ITEMS OF WORK INCLUDED:
   - a. SANITARY SEWER.
   - b. INDIRECT WASTE PIPING.
   - c. HOT AND COLD DOMESTIC WATER SYSTEM.
   - d. BACKFLOW PREVENTER.
   - e. VALVES AND ACCESSORIES.
   - f. FUEL GAS SYSTEM.
   - g. ROOF AND OVERFLOW DRAINS, ROOF LEADERS, AND STORM DRAIN PIPING.
   - h. UTILITY CONNECTION REQUIREMENTS
   - i. POTABLE WATER SYSTEM DISINFECTION.
   - j. PLUMBING FIXTURES AND WATER HEATER(S) PER DRAWINGS.
   - k. GAS WATER HEATER VENTS (AS APPLICABLE).
2. RELATED WORK SPECIFIED ELSEWHERE:
   - a. TRENCHING AND BACKFILL: SECTION EARTHWORK.
   - b. FIXTURES AND EQUIPMENT: SEE PLUMBING FIXTURE SCHEDULE ON DRAWINGS.
   - c. PAINTING: SECTION PAINTING
3. REQUIREMENTS:
   - a. CODES:
     - i. INTERNATIONAL PLUMBING CODE (IPC) OR UNIFORM PLUMBING CODE (UPC) WHERE APPLICABLE
     - ii. INTERNATIONAL MECHANICAL CODE (IMC)
     - iii. INTERNATIONAL FUEL GAS CODE (IFGC)
     - iv. INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
     - v. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
     - vi. ENVIRONMENTAL PROTECTION AGENCY (EPA) - LEAD-FREE FINAL RULE
     - vii. AMERICANS WITH DISABILITIES ACT (ADA)
     - viii. NATIONAL ELECTRICAL CODE (NEC)
     - ix. APPLICABLE LOCAL CODES
     - x. APPLICABLE SAFETY CODES
     - xi. CALIFORNIA ADMINISTRATIVE CODE, TITLE 24 (WHERE REQUIRED)
   - b. STANDARDS:
     - i. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

1. Z21.22 AMERICAN NATIONAL STANDARD FOR RELIEF VALVES AND AUTOMATIC GAS SHUTOFF DEVICES FOR HOT WATER SUPPLY SYSTEMS

ii. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

1. B16.1 GRAY IRON PIPE FLANGES AND FLANGED FITTINGS.
2. B16.3 MALLEABLE IRON THREADED FITTINGS.
3. B16.4 GRAY IRON THREADED FITTINGS.
4. B16.18 CAST COPPER ALLOY SOLDER-JOINT PRESSURE FITTINGS.
5. B16.22 WROUGHT COPPER AND COPPER ALLOY SOLDER-JOINT PRESSURE FITTINGS.
6. B16.23 CAST COPPER ALLOY SOLDER-JOINT PRESSURE FITTINGS.
7. B16.26 CAST COPPER ALLOY FITTINGS FOR FLARED COPPER TUBES.
8. B16.29 WROUGHT COPPER AND WROUGHT COPPER ALLOY SOLDER-JOINT DRAINING FITTINGS-DWV.
9. B16.51 COPPER AND COPPER ALLOY PRESS-CONNECT PRESSURE FITTINGS
10. B31.2 FUEL GAS PIPING.
11. B31.9 BUILDING SERVICES PIPING.

iii. AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL (ASTM)

1. B32 SOLDER METAL.
2. B88 SEAMLESS COPPER WATER TUBE.
3. D1785 POLY (VINYL CHLORIDE) (PVC) PLASTIC PIPE, SCHEDULES 40, 80, AND 120.
4. D2466 POLY (VINYL CHLORIDE) (PVC) PLASTIC PIPE FITTINGS, SCHEDULE 40.
5. D2564 SOLVENT CEMENTS FOR POLY (VINYL CHLORIDE) (PVC) PLASTIC PIPING SYSTEMS.
6. D2661 ACRYLONITRILE-BUTADIENE-STYRENE (ABS) SCHEDULE 40 PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS.
7. D2665 POLY (VINYL CHLORIDE) (PVC) PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS.
8. F876 CROSSLINKED POLYETHYLENE (PEX) TUBING.
9. F877 CROSSLINKED POLYETHYLENE (PEX) PLASTIC HOT AND COLD WATER DISTRIBUTION SYSTEMS.
10. F1970 SPECIAL ENGINEERED FITTINGS, APPURTENANCES OR VALVES FOR USE IN POLY (VINYL CHLORIDE) (PVC) OR CHLORINATED POLY (VINYL CHLORIDE) (CPVC) SYSTEMS

c. SUBMITTALS:

i. ELECTRONIC (PDF) MATERIALS LIST, SHOP DRAWINGS, AND DATA SHEETS SHALL BE SUBMITTED TO OWNER'S CONSTRUCTION MANAGER FOR REVIEW. SUBMITTALS SHALL BE MADE, AND FAVORABLE REVIEW SECURED BEFORE MATERIAL AND EQUIPMENT IS INSTALLED. SUBMIT CATALOG DATA SHEETS FOR:

1. VALVES AND ACCESSORIES.
2. HANGERS AND SUPPORTS.
3. CLEAN OUTS.
4. DIELECTRIC CONNECTIONS.
5. WATER HAMMER ARRESTORS.
6. FLOOR SINKS AND FLOOR DRAINS.
7. WATER HEATER AND ACCESSORIES.
8. PLUMBING FIXTURES.
9. BACK FLOW PREVENTER.

PRODUCTS

1. MATERIALS:

FOR MATERIAL APPLICATIONS SEE "MATERIAL SPECIFICATIONS" LATER IN THESE NOTES.

a. CAST IRON PIPING SYSTEMS
- i. SOIL PIPE AND FITTINGS: ASTM A74.

b. COPPER PRESSURE PIPING SYSTEMS:
- i. PIPING: TYPES 'K' AND 'L' COPPER PER ASTM B88.
- ii. FITTINGS: CAST COPPER ALLOY SOLDER-JOINT PRESSURE FITTINGS PER ASME B16.18 OR WROUGHT COPPER PER ANSI B16.22.
- iii. FLANGES: CLASS 150 POUND BRONZE: NIBCO, CHASE, OR APPROVED ALTERNATIVE.
- iv. UNIONS: SOLDER-END COPPER ALLOY: NIBCO, CHASE, OR APPROVED ALTERNATIVE.
- v. WATER VALVES:

1. BALL, 2-INCH AND SMALLER: 125 PSI WSP BRASS, SWEAT JOINTS: WATTS #WBVS OR APPROVED ALTERNATIVE.
2. CHECK VALVES: 150 PSI WSP, BRONZE BODY, SWEAT OR THREADED JOINTS: WATTS #CV OR CVS OR APPROVED ALTERNATIVE.

vi. AIR VALVES: BRONZE, SCREWED END, 150 SWP, CRANE #431-UB, STOCKHAM #120, OR APPROVED ALTERNATIVE.

vii. QUICK CONNECT COUPLING: 1/2-INCH SIZE BRASS CONSTRUCTION, PARKER HANNFIN, AMFLO, OR APPROVED ALTERNATIVE.

c. PVC PIPING SYSTEMS:
- i. PIPING: SCHEDULE 40 PVC PER ASTM D1785 OR SCHEDULE 80 PVC PER ASTM 1785.
- ii. FITTINGS AND FLANGES: PVC SCHEDULE 80 SOCKET WELDS PER ASTM D2466.
- iii. WATER VALVES: BALL VALVES PER ASTM F1970.

d. PEX PIPING SYSTEMS:
- i. TUBING: ASTM F876
- ii. DISTRIBUTION SYSTEMS: ASTM F877

e. JOINTS IN PIPING:
- i. COPPER: SOLDER-JOINT OR PRESS FITTINGS.
- ii. PLASTIC: SOCKET WELD AND FUSION WELD.
- iii. CAST IRON: COMPRESSION, OR NO-HUB JOINT.

2. FIXTURES:

SEE PLUMBING FIXTURE SCHEDULE ON PLANS.

3. EQUIPMENT:

a. HANGERS AND SUPPORTS:
- i. SPLIT-RING TYPE, GALVANIZED: ANVIL, SUPERSTRUT, OR APPROVED ALTERNATIVE.
- ii. TRAPEZE TYPE, GALVANIZED: UNISTRUT, KINDORF, OR APPROVE ALTERNATIVE.
- iii. BOLTED STEEL CLAMPS, GALVANIZED: GRINNELL, SUPERSTRUT, OR APPROVED ALTERNATIVE.
- iv. VERTICAL STRUT TYPE: UNISTRUT, KINDORF, OR APPROVED ALTERNATIVE.

b. PIPING ISOLATORS: METAL-CLAD FELT TYPE SPECIFICALLY MADE FOR ISOLATING PIPE FROM HANGER: SEMCO TRISOLATORS, SUPERSTRUT TYPE C715 ISOLATOR, OR APPROVED ALTERNATIVE.

c. WATER HAMMER ARRESTORS: JR SMITH HYDROTROL, ZURN SHOCKTROL, OR APPROVED ALTERNATIVE.

d. BACKFLOW PREVENTER: REDUCED PRESSURE TYPE, BRONZE CONSTRUCTION, THREE-YEAR APPROVAL BY THE FOUNDATION FOR CROSS-CONNECTION CONTROL RESEARCH, UNIVERSITY OF SOUTHERN CALIFORNIA: FEBCO MODEL 835B, WATTS LF009, BEECO FRP, OR APPROVED ALTERNATIVE.

e. DIELECTRIC CONNECTIONS, INSULATING UNIONS: CAPITOL, CLAYTON-MARK (PETRO), OR APPROVED ALTERNATIVE. FOR COLD WATER ONLY, SCHEDULE 80 PENTON, OR CPVC NIPPLES, 4-INCH LONG, MAY BE USED.

4. MISCELLANEOUS MATERIALS:
- a. FLASHING FOR PIPING PROTRUDING THROUGH EXTERIOR WALLS OR ROOF: 16-OUNCE PER SQUARE FOOT COPPER, OR 4-POUND PER SQUARE FOOT LEAD.
- b. SOLDER: 95/5 (TIN ANTIMONY) PER ASTM B32.
- c. CAULKING LEAD: 99.7 PERCENT PURE LEAD.
- d. PIPE SLEEVES: STEEL, CAST IRON, OR PLASTIC.
- e. ESCUTCHEONS: CAST IRON, MALLEABLE IRON, PAINTED OR CHROME PLATED.
- f. INSULATION: FIBERGLASS, CELLUAR FOAM, PLASTIC JACKET, OR APPROVED ALTERNATIVE.

5. SUBSTITUTIONS:
- a. SUBSTITUTIONS MAY BE CONSIDERED IN LIEU OF SPECIFIED FIXTURES AS FOLLOWS:
  - i. FLOOR INSTALLED FIXTURES AND CLEAN OUTS - J.R. SMITH, JOSAM, ZURN.
  - ii. WATER CLOSETS, LAVATORIES, URINALS - KOHLER, AMERICAN STANDARD, CANE.
  - iii. ROOF DRAINS: J.R. SMITH, JOSAM, ZURN.
  - iv. WATER HEATER - STATE, A.O. SMITH, RHEEM, LOCHINVAR.

THESE AND OTHER EQUIVALENT ALTERNATIVES SHALL BE PRESENTED TO THE OWNER'S CONSTRUCTION MANAGER FOR CONSIDERATION PER THE 'SUBMITTALS' SECTION.

EXECUTION:

1. INSTALLATION - GENERAL:
- a. PIPING SHALL INCLUDE ALL PIPING, FITTINGS AND VALVES: CONNECT TO EXISTING PIPING UTILITIES AS INDICATED ON DRAWINGS.
- b. CONCEAL ALL INTERIOR PIPING IN WALLS OR ABOVE CEILINGS, EXCEPT WHERE SHOWN TO BE EXPOSED.
- c. PROVIDE FOR EXPANSION AND CONTRACTION OF ALL PIPES.
- d. PROVIDE REDUCING FITTINGS FOR ALL CHANGES IN PIPE SIZE - DO NOT USE BUSHINGS.
- e. PROVIDE DIELECTRIC ISOLATION BETWEEN DISSIMILAR METALS AND WHERE REQUIRED AT EQUIPMENT CONNECTIONS.
- f. PROVIDE FITTINGS FOR ALL CHANGES IN PIPE DIRECTION.
- g. CONTAMINATION PRECAUTIONS: DO NOT CROSS-CONNECT OR INTERCONNECT BETWEEN POTABLE WATER PIPING AND DRAIN, SOIL, OR WASTE PIPING.

2. INSTALLATION - SYSTEMS:
- a. WATER PIPING:
  - i. PEX OR COPPER TYPE "L".
  - ii. PROVIDE SHUTOFF VALVES AS INDICATED OR REQUIRED.
  - iii. PROVIDE DRAIN VALVES WHERE REQUIRED FOR COMPLETE SYSTEM DRAINAGE.
  - iv. PROVIDE WATER HAMMER ARRESTORS SIZED AND LOCATED PER TABLE V, WH-201 OR AS SHOWN.
  - v. PROVIDE BACK FLOW PREVENTER WHERE SHOWN.
- b. SANITARY PIPING:
  - i. PVC OR CAST IRON.
  - ii. GRADING: SLOPE HORIZONTAL SOIL AND WASTE PIPING 1/4-INCH PER FOOT WHERE POSSIBLE, BUT IN NO CASE LESS THAN 1/8-INCH PER FOOT.

3. INSTALLATION - TESTING:

ALL HOT AND COLD WATER SUPPLY, DRAINAGE, AND VENT PIPING SHALL BE TESTED AS INDICATED BELOW OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS MORE STRINGENT. NO PIPING SYSTEM SHALL BE COVERED UP OR BURIED UNTIL SUCCESSFULLY TESTED AND APPROVED BY THE OWNER AND THE LOCAL PLUMBING INSPECTOR.

a. WATER PIPING: UPON COMPLETION OF A SECTION, OR OF THE ENTIRE HOT AND COLD WATER SUPPLY SYSTEM, IT SHALL BE TESTED AND PROVED WATERTIGHT UNDER A WATER PRESSURE NOT LESS THAN THE WORKING PRESSURE UNDER WHICH IT IS TO BE USED, OR EIGHTY (80) PSIG, WHICHEVER IS HIGHER (VERIFY WITH THE LOCAL WATER COMPANY). THE WATER USED FOR TESTING SHALL BE OBTAINED FROM A POTABLE SOURCE OF SUPPLY. THE PIPING UNDER TEST SHALL WITHSTAND THE TEST WITHOUT LEAKING FOR A PERIOD OF NOT LESS THAN FIFTEEN (15) MINUTES.

ANY SECTION OF PIPING FAILING THE TEST SHALL BE REPAIRED AND RETESTED, AS INDICATED ABOVE UNTIL SUCCESSFUL, HOLDING THE APPLIED PRESSURE FOR AT LEAST THE SPECIFIED TIME PERIOD.

b. DRAINAGE PIPING: UPON COMPLETION OF A SECTION, OR OF THE ENTIRE DRAINAGE AND VENTING SYSTEMS, THEY SHALL BE TESTED AND PROVED WATERTIGHT UNDER A WATER PRESSURE NOT LESS THAN A TEN (10) FOOT HEAD. IF THE SYSTEM IS TESTED IN SECTIONS, EACH OPENING SHALL BE TIGHTLY PLUGGED EXCEPT AT THE HIGHEST OPENING OF THE SECTION UNDER TEST, AND EACH SECTION SHALL BE FILLED WITH WATER TO A TEN (10) FOOT HEAD. IN TESTING SUCCESSIVE SECTIONS AT LEAST THE UPPER TEN (10) FEET OF THE NEXT PROCEEDING SECTION SHALL BE TESTED, SO THAT NO JOINT OR PIPE IN THE BUILDING SHALL HAVE BEEN TESTED TO LESS THAN TEN (10) FOOT HEAD OF WATER. THE WATER SHALL BE KEPT IN THE SYSTEM, OR IN THE SECTION UNDER TEST, FOR AT LEAST THIRTY (30) MINUTES AND MAINTAIN THE APPLIED PRESSURE WITHOUT LEAKING.

ANY SECTION OF THE DRAINAGE OR VENT PIPING FAILING THE TEST SHALL BE REPAIRED AND RETESTED AS INDICATED ABOVE UNTIL SUCCESSFULLY HOLDING THE APPLIED PRESSURE FOR AT LEAST THE SPECIFIED TIME PERIOD.

4. GUARANTEE:
- a. ALL WORK SHALL BE GUARANTEED FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. THE GUARANTEE PERIOD FOR CERTAIN ITEMS SHALL BE LONGER, AS INDICATED IN THE SPECIFICATIONS FOR THOSE ITEMS.
- b. SHOULD ANY MALFUNCTION DEVELOP DURING THE GUARANTEE TIME PERIOD DUE TO DEFECTIVE MATERIAL, FAULTY WORKMANSHIP, OR NONCOMPLIANCE WITH PLANS, SPECIFICATIONS, CODES, OR DIRECTIONS OF THE OWNER, ARCHITECT, ENGINEER, OR INSPECTOR, THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR AND MATERIALS TO CORRECT THE MALFUNCTION WITHOUT ADDITIONAL CHARGES.

5. CLEANING:
- a. THE PLUMBING CONTRACTOR SHALL REMOVE ALL WASTE GENERATED BY THE PLUMBING WORKS ON A DAILY BASIS, AND KEEP THE JOB SITE CLEAR AND SAFE FROM ANY DEBRIS AND/OR ITEMS THAT FALL UNDER HIS RESPONSIBILITY. UPON COMPLETION OF THE PROJECT, THE PLUMBING WORKS SHALL BE CLEANED INCLUDING PLUMBING FIXTURES, WASTE LINES, WATER HEATERS, AND ANY OTHER PLUMBING DEVICES. THIS SHALL BE PERFORMED TO THE SATISFACTION OF THE OWNER OR THE OWNER'S REPRESENTATIVE AND SHALL OCCUR BEFORE FINAL ACCEPTANCE OF THE PROJECT. ALL DEBRIS AND WASTE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A SAFE MANNER AS REQUIRED BY LOCAL AND STATE AUTHORITIES.

6. MATERIALS SPECIFICATION:
- a. SANITARY SOIL, WASTE, AND VENT SYSTEMS: SOIL, WASTE, AND VENT PIPING SHALL BE SCHEDULE 40 PVC OR CAST IRON. BEFORE COMMENCEMENT OF WORK, CONTRACTOR SHALL VERIFY THAT PIPE TO BE INSTALLED COMPLIES WITH LOCAL CODES AND WILL BE ACCEPTABLE TO LOCAL BUILDING INSPECTORS. CONTRACTOR SHALL BEAR ALL COSTS FOR REMOVAL AND REPLACEMENT OF ANY UNACCEPTABLE PIPE. WHERE PVC IS UNACCEPTABLE, SOIL AND WASTE PIPING BELOW SLAB AND INCLUDING YARD PIPING SHALL BE STANDARD WEIGHT CAST IRON SOIL PIPE AND FITTINGS (NO HUB). THE COUPLINGS SHALL BE STAINLESS STEEL SHIELDS AND CLAMP WITH NEOPRENE GASKETS. VENT PIPING ABOVE FLOOR SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH CAST IRON DRAINAGE PATTERN SCREW FITTINGS.
- b. WATER PIPING ABOVE AND BELOW SLAB: TYPE "K" OR "L", HARD DRAWN COPPER TUBING WITH 95-5 TIN/ANTIMONY SOLDER OR APPROVED "LEAD-LESS" JOINT FITTINGS OR PEX TUBING.
- c. WATER PIPING BELOW GRADE OUTSIDE BUILDING: SCHEDULE 40 PVC, IF PVC IS UNACCEPTABLE TO LOCAL AUTHORITIES OR IF SOIL IS CONTAMINATED USE TYPE "K", HARD DRAWN COPPER TUBING WITH 95-5 TIN/ANTIMONY SOLDER OR APPROVED "LEAD-LESS" JOINT FITTINGS. WHERE STREET PRESSURE EXCEEDS 80 PSI PROVIDE PRESSURE REDUCING VALVE ASSEMBLY COMPLETE WITH RELIEF VALVE. NO JOINTS WILL BE ALLOWED UNDER BUILDING SLAB.
- d. INDIRECT & CONDENSATE DRAINS: COPPER, TYPE "M" WITH 95-5 TIN/ANTIMONY SOLDER JOINT FITTINGS. NO JOINTS WILL BE ALLOWED UNDER BUILDING SLAB.
- e. INSULATION: ALL COLD WATER LINES WITHIN THE BUILDING (IN AREAS WITH HIGH OUTDOOR HUMIDITY AND/OR TEMPERATURE OR LOW OUTDOOR TEMPERATURE ONLY) SHALL BE INSULATED WITH "PPG" INDUSTRIES, CERTAIN TEED SAINT GOBAIN SNAP-ON OR JOHN MANSINSULATION. ALL HOT WATER LINES WITHIN THE BUILDING SHALL BE INSULATED WITH "PPG" INDUSTRIES, CERTAIN TEED SAINT GOBAIN SNAP-ON OR JOHN MANSVILLE MICRO-LOC, EXCEPT IN THE CEILING SPACE WHICH SHALL BE JOHN MANSVILLE AEROTUBE FOAM PLASTIC PIPE INSULATION. HOT AND COLD WATER INSULATION SHALL BE 1" THICK OR PER LOCAL CODES. EXPOSED HOT AND COLD WATER PIPES, AND TRAPS BELOW RESTROOM LAVATORIES SHALL BE INSULATED WITH 'TRUEBRO' INSULATION KIT, SEE PLUMBING SCHEDULE. ALL HVAC CONDENSATE DRAINS INCLUDING WASTE LINES FROM EVAPORATIVE COOLERS SHALL BE INSULATED WITH 1/2" THICK JOHN MANSVILLE AEROTUBE FOAM PLASTIC PIPE INSULATION.
- f. WATER HAMMER ARRESTORS: ALL STAINLESS STEEL CONSTRUCTION BELLOWS-TYPE, PDI APPROVED AND CERTIFIED SIZING AND PLACEMENT CONFORMING TO PLUMBING AND DRAINAGE INSTITUTE STANDARD PDI-WH 201 LATEST EDITION AND AS MANUFACTURED BY J.R. SMITH, ZURN, OR PFF, INC.

PLUMBING LEGEND & SYMBOLS

SYMBOL	DESCRIPTION
	HOT WATER (DOMESTIC)
	SANITARY WASTE PIPING
	SANITARY VENT PIPING
	EXISTING EQUIPMENT OR PIPING TO BE REMOVED.
	COLD WATER (DOMESTIC)
	CAST IRON SANITARY WASTE PIPING
	NATURAL GAS PIPING
	WALL CLEANOUT
	HOT WATER RETURN (DOMESTIC)
	CONDENSATE DRAIN PIPING
	GREASE WASTE PIPING
	TEMPER WATER 105°F
	WALL HYDRANT OR HOSE BIBB
	GATE VALVE
	BALL VALVE
	PRESSURE REDUCING VALVE (PRV)
	TEMPERATURE/PRESSURE RELIEF VALVE
	RELIEF/SAFETY VALVE
	GAS COCK
	FLOOR DRAIN
	FLOOR CLEANOUT
	FLOOR SINK
	PIPE RISING UP
	PIPE DROPPING DOWN
	WATER HAMMER ARRESTER
	CONCENTRIC REDUCER
	UNION - SCREWED OR FLANGED
	PUMP
	GAS PRESSURE REGULATOR

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
AHU	AIR HANDLING UNIT	MTD	MOUNTED
BFF	BELOW FINISHED FLOOR	NIC	NOT IN CONTRACT
BFP	BACKFLOW PREVENTER	NTS	NOT TO SCALE
BOP	BOTTOM OF PIPE	NG	NATURAL GAS
CHWP	CHILLED WATER PUMP	ORD	OVERFLOW ROOF DRAIN
CHWR	CHILLED WATER RETURN	OVHD	OVERHEAD
CHWS	CHILLED WATER SUPPLY	PC	PLUMBING CONTRACTOR
CONT	CONTINUATION	PRV	PRESSURE REDUCING VALVE
CO	CLEAN OUT	RD	ROOF DRAIN
COORD	COORDINATE	SS	SANITARY SEWER
CW	COLD WATER	T&P	TEMPERATURE & PRESSURE
DN	DOWN	TYP	TYPICAL
FD	FLOOR DRAIN	TW	TEMPERED HOT WATER
FCO	FLOOR CLEAN OUT	V	VENT
FS	FLOOR SINK	VTR	VENT THRU ROOF
GC	GENERAL CONTRACTOR	W	WASTE
GPH	GALLONS PER HOUR	W/	WITH
GPM	GALLONS PER MINUTE	WCO	WALL CLEAN OUT
HB	HOSE BIBB	WH	WATER HEATER
HD	HUB DRAIN	WHA	WATER HAMMER ARRESTER
HW	HOT WATER	WHD	WALL HYDRANT
HWR	HEATING HOT RECIRCULATION	YCO	YARD CLEANOUT
IE	INVERT ELEVATION		

NOT ALL ABBREVIATIONS ARE USED

VENT THROUGH ROOF NOTE:
PLUMBING CONTRACTOR IS NOT TO CUT HOLES IN ROOF FOR VENT THROUGH ROOF PENETRATIONS UNLESS CONSULTING WITH BUILDING/ROOFING CONTRACTOR BEFOREHAND.

ACCEPTABLE PLUMBING FIXTURE AND TRIM SUBSTITUTES

PLUMBING FIXTURE AND TRIM SUBSTITUTES	FIXTURE SUPPORTS	DRAINS AND CLEANOUTS
AMERICAN STANDARD CRANE KOHLER SLOAN DELANY	SMITH WADE TYLER ZURN	J.R.SMITH ZURN ORION

NOTES:

PLUMBING MATERIAL AND INSTALLATION SHALL COMPLY WITH (2018 INTERNATIONAL PLUMBING CODE), LOCAL GOVERNMENTS AND REGULATORY AGENCIES.

ALL DOMESTIC WATER LINES SHALL BE DISINFECTED IN ACCORDANCE WITH APPLICABLE PARAGRAPHS OF AWWA C-601, "STANDARD PROCEDURE FOR DISINFECTION OF WATER LINES".

GENERAL PLUMBING NOTES:

1. ALL WORK SHALL BE ARRANGED IN A NEAT, WELL ORGANIZED MANNER. ALL WORK SHALL BE PARALLEL AND PERPENDICULAR TO THE PRIMARY LINES OF THE BUILDING. LOCATE ALL OPERATING AND CONTROL EQUIPMENT PROPERLY TO PROVIDE CODE AND/OR MANUFACTURERS CLEARANCES.
2. ALL CONDENSATE, INDIRECT WASTE, ROOF DRAINS, SANITARY SEWER, GREASE WASTE, COMBINATION WASTE/VENT PIPING TO BE SLOPED AT 1/4" PER FOOT UNLESS NOTED OTHERWISE ON PLANS.
3. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE PORTIONS OF ALL NATIONAL, STATE, AND LOCAL CODES AND STANDARDS. WHERE THE CONTRACT DOCUMENTS ARE IN EXCESS OF CODE REQUIREMENTS, THE CONTRACT DOCUMENTS SHALL GOVERN. IN THE EVENT OF A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND APPLICABLE CODES, THE LATTER SHALL GOVERN.
4. GC SHALL ENSURE THAT ALL LIGHTS, SPRINKLER HEADS, DIFFUSERS AND OTHER CEILING DEVICES ARE CENTERED IN CEILING TILES AND IN BETWEEN LIGHT FIXTURES.
5. ALL PIPING TO BE INSULATED PER SPECIFICATIONS UNLESS NOTED OTHERWISE ON THE PLANS.
6. PROVIDE ASSE 1010 CERTIFIED WATER HAMMER ARRESTOR AT ALL QUICK CLOSING VALVES PER PLUMBING AND LOCAL CODES.
7. FURNISH AND INSTALL ALL ITEMS, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY REASONABLY NECESSARY TO FACILITATE EACH SYSTEMS' FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT SPECIFIED. ELEMENTS OF THE WORK SHALL INCLUDE, BUT ARE NOT LIMITED TO MATERIALS, LABOR, SUPERVISION, SUPPLIES, EQUIPMENT, TRANSPORTATION, HOISTING/RIGGING, STORAGE, UTILITIES AND ALL REQUIRED PERMITS AND LICENSES.
8. ALL ADA FIXTURES TO BE PROVIDED WITH ALL NECESSARY FITTINGS, ACCESSORIES FOR ADA COMPLIANCE. ALL ADA WATER CLOSETS TO HAVE TRIP LEVERS ON OPEN SIDE OF STALL.
9. EQUIPMENT LOCATIONS SHOWN ON PLAN ARE APPROXIMATE. COORDINATE EXACT LOCATION WITH STRUCTURAL AND OTHER EQUIPMENT PRIOR TO ROUGH-IN.
10. CONTRACTOR SHALL COORDINATE ALL PIPE ROUTING WITH STRUCTURE AND OTHER DISCIPLINES PRIOR TO PURCHASING, CONSTRUCTING, OR INSTALLING ANY PIPING.
11. MAINTAIN ALL OUTSIDE AIR INTAKE OPENINGS MINIMUM 10'-0" FROM ALL MECHANICAL VENTS, PLUMBING VENTS, AND EXHAUST FANS.
12. PROVIDE SHUT OFF VALVES AT EACH FIXTURE BRANCH IN ADDITION TO SHUT OFF VALVES AT FIXTURES FOR MAINTENANCE OR REPLACEMENT OF EACH FIXTURE.
13. ALL PIPING SHALL BE CONSTRUCTED, SEALED AND SUPPORTED PER SPECIFICATIONS.
14. PROVIDE ALL PLUMBING EQUIPMENT WITH NEW LAMINATED IDENTIFICATION TAGS. LABEL TAGS AS SHOWN ON PLAN.
15. ALL GAS FIRED EQUIPMENT TO BE U.L. LISTED AND A.S.A. APPROVED.
16. ALL EQUIPMENT SHALL BE ANCHORED TO THE BUILDING STRUCTURE.
17. EXCEPT AS REQUIRED BY IMC SECTIONS 602.2.1.1 THROUGH 602.2.1.6, MATERIALS WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM-E-84 OR UL-723.
18. PROVIDE SLEEVES AND FLASHINGS REQUIRED FOR PIPING AND DUCTWORK PENETRATIONS. PROVIDE ESCUTCHEON PLATES FOR ALL PIPING PENETRATING FINISHED WALLS AND CEILINGS. ALL INTERIOR AND EXTERIOR WALL PENETRATIONS SHALL BE TIGHTLY SEALED TO MINIMIZE ENTRY OF RODENTS AND INSECTS.
19. FIELD VERIFICATION OF EXISTING CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES FOUND PRIOR TO SUBMISSION OF BID. THE CONTRACTOR SHALL TAKE NOTE THAT THE DRAWINGS ARE SCHEMATIC IN NATURE AND INDICATE THE APPROXIMATE LOCATIONS OF THE MECHANICAL AND PLUMBING SYSTEMS. LOCATE ALL ITEMS BY ON-THE-JOB MEASUREMENTS. COOPERATE WITH OTHER TRADES TO ENSURE PROPER FIT AND ACCESS TO ALL ITEMS.
20. COORDINATE WITH ELECTRICAL TO PROVIDE POWER FOR ALL RECIRCULATION OR CONDENSATE PUMPS, TIME CLOCKS AND HEAT TRACE WIRING WHETHER OR NOT SHOWN ON PLANS.
21. CONSIDERATION SHALL NOT BE GRANTED FOR MISUNDERSTANDING OF THE SCOPE OR AMOUNT OF WORK TO BE PERFORMED. TENDER OF A PROPOSAL CONVEYS FULL CONTRACTOR AGREEMENT OF THE ITEMS AND CONDITIONS SPECIFIED AND/OR INDICATED, SCHEDULED, OR IMPLIED ON THE CONTRACT DOCUMENTS, AND/OR REQUIRED BY THE NATURE OF THIS WORK.
22. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL COORDINATE THE INSTALLATION OF DUCTWORK, PIPING, CONDUIT, CABLE, ETC., INSTALLATION WITH LIGHTING FIXTURES, SPECIAL CEILING CONSTRUCTION, AIR DISTRIBUTION EQUIPMENT AND THE STRUCTURE. PROVIDE ADDITIONAL RISES AND OFFSETS AS REQUIRED. IF, AFTER INSTALLED, NEW DUCTWORK, PIPING CONDUIT, OR CABLE IS FOUND TO BE IN CONFLICT WITH THE ARCHITECTURE, STRUCTURE, OR OTHER TRADE WORK, OR WHICH IS EITHER EXISTING OR SHOWN ON THE CONTRACT DOCUMENT, THE DUCTWORK, CONDUIT, OR CABLE SHALL BE RELOCATED WITHOUT ADDITIONAL COST TO THE OWNER.
23. THE CONTRACTOR SHALL PROTECT THE WORK, EQUIPMENT, AND MATERIALS FROM DAMAGE BY HIS WORK OR HIS PERSONNEL, AND SHALL CORRECT ALL DAMAGE THUS CAUSED WITHOUT ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK, MATERIALS, AND EQUIPMENT UNTIL FINAL ACCEPTANCE BY THE OWNER. PROTECT ALL WORK AGAINST THEFT, INJURY, OR DAMAGE AND CAREFULLY STORE MATERIAL AND EQUIPMENT RECEIVED ON SITE WHICH IS NOT IMMEDIATELY INSTALLED. THE CONTRACTOR SHALL CLOSE OPEN ENDS OF WORK WITH TEMPORARY COVERS OR PLUGS DURING CONSTRUCTION TO PREVENT THE ENTRY OF DUST, DIRT, AND OBSTRUCTING MATERIAL. THE CONTRACTOR SHALL PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE DUE TO WATER, SPRAY-ON FIREPROOFING, CONSTRUCTION DEBRIS, ETC. IN A MANNER ACCEPTABLE TO THE ENGINEER AND/OR OWNER.
24. PROVIDE ASSE 1070 APPROVED THERMOSTATIC MIXING VALVE AT ALL HAND SINKS/LAVATORIES.
25. ALL GAS PIPING TO BE SUPPORTED PER SECTION 407 OF THE IFGC AT INTERVALS AND BY SUPPORTS CONFORMING TO THE REQUIREMENTS OF MSS SP-58.

PLUMBING FIXTURE SCHEDULE

ITEM	DESCRIPTION	FIXTURE	WASTE	VENT	HOT SUPPLY	COLD SUPPLY
WC-1	ELONGATED, VITREOUS CHINA, WHITE, SIPHON JET, 1.6 GAL FLUSH W/BEMIS 1655/SS OPEN FRONT SEAT AMERICAN STANDARD AFWALL 2859.016.020. HEIGHT W/ SLOAN ROYAL #111 MANUAL FLUSH VALVE (OR EQUAL).	WALL MOUNTED WATER CLOSET FLUSH VALVE	4	2	-	1
WC-1A	ELONGATED, VITREOUS CHINA, WHITE, SIPHON JET, 1.6 GAL FLUSH W/BEMIS 1655/SS OPEN FRONT SEAT AMERICAN STANDARD AFWALL 2294011. HEIGHT W/ SLOAN ROYAL #111 MANUAL FLUSH VALVE (OR EQUAL). FLUSH VALVE HANDLES SHALL BE ON RIGHT OR LEFT SIDE, TO MATCH THE WIDE SIDE OF THE HANDICAPPED STALL. COORDINATE INSTALLATION WITH ADA GRAB BARS.	WALL MOUNTED WATER CLOSET FLUSH VALVE (ADA)	4	2	-	1
L-1	WETSTYLE MODEL VC 854U, 54x15, UNDERMOUNT TROUGH SINK WITH TRUE HIGH GLOSS FINISH AND POLISHED CHROME OVERFLOW. PROVIDE WITH 2 OR 3 DELTA MODEL# 87T105 METERED FAUCETS (REF ARCH PLANS), CHROME PLATED ANGLE VALVES, STAINLESS STEEL BRAIDED SUPPLY TUBES, CHROME PLATED P-TRAP, PREMOLDED INSULATED COVERS FOR WASTE AND WATER PIPING, AND ASSE 1070 APPROVED MIXING VALVE. VERIFY TROUGH LENGTH W/ ARCH PLANS.	UNDERMOUNT LAVATORY (HANDICAP ACCESSIBLE)	2	1 1/2	1/2	1/2
L-2	AMERICAN STANDARD DECORUM 9024.001EC, 20" x 18-1/4" SINK, VITREOUS CHINA, WALL-HUNG LAVATORY WITH 4" CENTERS OR EQUAL. PROVIDE WITH DELTA 87T105 OR EQUAL, ANGLE STOP SUPPLIES WITH TUBES & ESCUTCHEONS, P-TRAP AND J.R. SMITH CONCEALED ARM CARRIER. MOUNT TOP OF RIM 34" AFF. PROVIDE WITH A.D.A. APPROVED, PREMOLDED INSULATED COVERS FOR WASTE & SUPPLIES BELOW LAVATORY. PROVIDE WITH ASSE 1070 APPROVED MIXING VALVE	WALL HUNG LAVATORY (HANDICAP ACCESSIBLE)	2	1 1/2	1/2	1/2
UR-1	AMERICAN STANDARD TRIMBROOK, VITREOUS CHINA, 3/4" TOP SPUD (OR EQUAL) PROVIDE W/ SLOAN ROYAL 180 MANUAL FLUSH VALVE & HEAVY DUTY WALL CARRIER.	WALL HUNG URINAL	3	2	-	3/4
MS-1	FIAT FLOOR MOUNTED MSBID2424, FAUCET- 830-AA W/ VACUUM BREAKER, HOSE & HOSE BRACKET #832-AA, MOP BRACKET 889-CC, BUMPERGUARDS #1239BB & MSG2424 WALL GUARDS - STAINLESS STEEL.	MOP SINK	3	2	3/4	3/4
S-1	ADA BRADLEY WASHFOUNTAIN. SN2024. CONFIRM FIXTURE SELECTION WITH OWNER PRIOR TO CONSTRUCTION. PROVIDE WITH ALL OPTIONS NECESSARY FOR ADA COMPLIANCE	SEMICIRCULAR WASHFOUNTAIN	2	1 1/2	1/2	1/2
EWC-1	ELKAY MODEL EZSTL-8-C, TWO LEVEL, WALL MOUNTED, BARRIER-FREE ELECTRIC WATER COOLER WITH FRONT AND SIDE EASY TOUCH CONTROLS, FLEXI-GUARD SAFETY BUBBLER AND EXTRA DEEP BASIN OR EQUAL W/ ELKAY MODEL EZSTL8WS BOTTLE FILLING STATION, 115V, 8 GPH, 5.0 AMPS, 370 W	BOTTLE FILLING STATION ELECTRIC WATER COOLER (BI-LEVEL)	2	1 1/2	-	1/2
WH-1	96 GALLON, ELECTRIC, 60.0 KW FOR 248 GPH RECOVERY @ 100° RISE, AO SMITH MODEL #DES-120-60. AMTROL MODEL EXPANSION TANK ST 5-C. PROVIDE WITH WATER HEATER STAND, DRAIN PAN AND SEISMIC BRACING.	WATER HEATER	-	-	2	2
WH-2	2.0 GPM, ELECTRIC, 10.1 kW, 208V/1, FOR 34° F RISE. EEMAX PRO13240 MOUNT UNDER LAV. PITCH ALL DRAINAGE PIPING AT $\frac{1}{4}$" FOOT MINIMUM.	INSTANTANEOUS WATER HEATER	-	-	3/4	3/4
NFWH-1	WOODFORD #65, AUTOMATIC DRAINING, FREEZEPROOF WALL HYDRANT WITH ANTI-SIPHON VACUUM BREAKER AND LOOSE TEE KEY OR EQUAL.	NON FREEZE WALL HYDRANT	-	-	-	3/4
NFRH-1	WOODFORD SRH-MS, AUTOMATIC DRAINING, FREEZEPROOF ROOF HYDRANT WITH ANTI-SIPHON VACUUM BREAKER. NO DRAIN LINE REQUIRED.	NON FREEZE ROOF HYDRANT	-	-	-	3/4
FD-1	FLOOR DRAIN - ZURN MODEL ZN-415, 6" TYPE B STRAINER, WITH CAST IRON HOUSING, ADJUSTABLE SATIN BRONZE TOP, CLAMPING COLLAR, AND OUTLET CONNECTION TO MATCH PIPING SIZE AS INDICATED ON DRAWINGS. INSTALL SURE SEAL INLINE 3" FLOOR DRAIN TRAP SEALER AS PER MANUFACTURER RECOMMENDATIONS.	FLOOR DRAIN	3	2	-	-
FCO	FLOOR CLEANOUT - ZURN MODEL ZN-1400, WITH SATIN BRONZE TOP, ADJUSTABLE CAST IRON HOUSING, PVC TAPERED PLUG AND OUTLET CONNECTION TO MATCH PIPING. PROVIDE CLAMPING FLANGE FOR FLOORS HAVING A WATERPROOF MEMBRANE. SIZE AS INDICATED ON DRAWINGS.	FLOOR CLEAN OUT	SEE PLAN	-	-	-
WCO	WALL CLEANOUT-ZURN MODEL Z-1441-A-BP WITH BRASS PLUG AND STAINLESS STEEL COVER.	WALL CLEANOUT	SEE PLAN	-	-	-
DCO	2 X FCO	DOUBLE CLEANOUT	SEE PLAN	-	-	-
RCP-1	TACO RECIRCULATION PUMP, MODEL NO. 006, 4 GPM, 1/40 HP @ 3250 RPM, 115/1/60	RECIRCULATION PUMP	-	-	-	3/4
SH-1A	SPEAKMAN S-4200-E15 SHOWER HEAD	SHOWER HEAD	-	-	3/4	3/4
SP-1	STANCOR WSE50 SUMP PUMP. 115V SINGLE PHASE. 8.0 FLA. 22' HEAD AT 50 GPM.	SUMP PUMP	2	-	-	-

GENERAL PLUMBING FIXTURE NOTES: (THESE NOTES APPLY TO ALL APPLICABLE PLUMBING FIXTURES)

1. ROUGH-IN ALL WASTE AND SUPPLIES TO SPECIAL EQUIPMENT ACCORDING TO MANUFACTURER'S APPROVED SHOP DRAWINGS AND MAKE FINAL CONNECTIONS. ALL FIXTURES SHALL HAVE SHUT-OFF VALVES.

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