PLUMBING ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AG	AIR GAP
BFP	BACKFLOW PREVENTER
CD	CONDENSATE DRAIN
CO	CLEANOUT
CW	COLD WATER
(D)	DEMOLISH
DWG	DRAWING
(E)	EXISTING
ET	EXPANSION TANK
F	FAHRENHEIT
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FS	FLOOR SINK
GPM	GALLONS PER MINUTE
HW	HOT WATER
HWR	HOT WATER RETURN
IN WC	INCHES OF WATER COLUMN
ISPC	IDAHO STATE PLUMBING CODE
LAV	LAVATORY
MIN	MINIMUM
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
RE:	REFERENCE
SCW	SOFT COLD WATER
SS	SANITARY SEWER
TYP	TYPICAL
V	VENT
VBF	VENT BELOW FLOOR
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WATER HEATER
WS	WATER SOFTENER

PLUMBING PIPING SYMBOLS

- PIPE ELBOW UP
- PIPE ELBOW DOWN
- PIPE TEE BRANCH UP (WITH ELBOW)
- PIPE TEE BRANCH DOWN (WITH ELBOW)
- INDICATES DIRECTION OF DOWNWARD PITCH
- FLOW DIRECTION INDICATOR
- PIPE CAP
- BALL VALVE
- CONTROL STOP
- VTR — VENT THROUGH ROOF
- WALL CLEANOUT
- FLOOR CLEANOUT OR GRADE CLEANOUT
- FLOOR DRAIN, ROUND
- FLOOR SINK

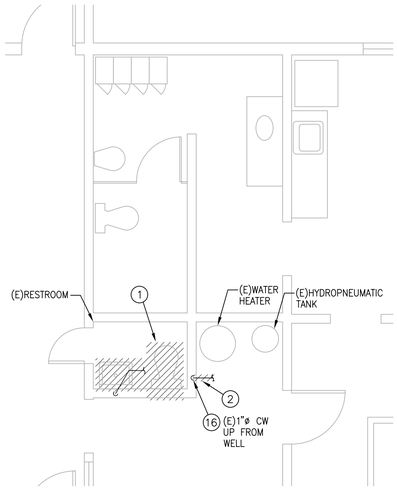
PLUMBING LINETYPE LEGEND

NOTE: SUFFIX (E) IN CONJUNCTION WITH LIGHTER SHADING INDICATES EXISTING PIPE OR EQUIPMENT. (TYPICAL OF ALL EQUIPMENT AND PIPING).

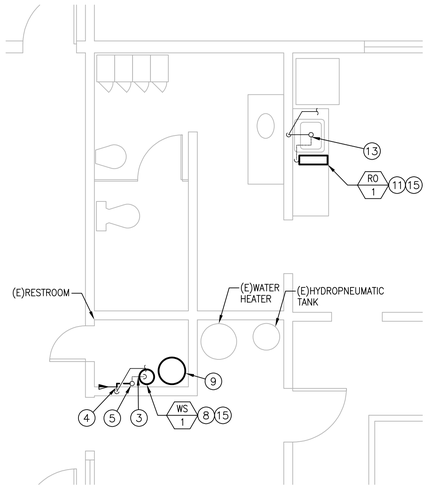
NEW	EXISTING	TO BE DEMOLISHED	
			DOMESTIC COLD WATER
			SOFT COLD WATER
			DOMESTIC HOT WATER
			DOMESTIC HOT WATER RETURN
			PLUMBING EQUIPMENT
			SANITARY SEWER (BELOW GRADE)
			SANITARY VENT

PLUMBING ANNOTATION SYMBOLS

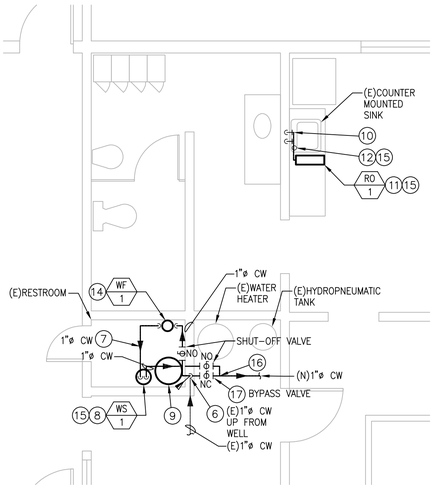
- WC / 1 — FIXTURE OR EQUIPMENT CALLOUT
- 1 — KEY NOTES
- # — REVISION
- (E) / (N) — CONNECT NEW TO EXISTING (SHADED SIDE IS NEW WORK)



1 DEMO PLUMBING PLAN
SCALE: 1/4" = 1'-0"



2 WASTE AND VENT PLAN
SCALE: 1/4" = 1'-0"



3 WATER PLAN
SCALE: 1/4" = 1'-0"

PLUMBING SHEET INDEX

PLUMBING GENERAL NOTES

A. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE CODES, LOCAL CODES, LOCAL STANDARDS, IBC, IPC, NFPA, AND THE LANDLORD'S AND TENANT'S REQUIREMENTS INCLUDING SUPPLEMENTS AND DETAILS.

B. PROVIDE SEAL BETWEEN WALLS AND PLUMBING FIXTURES PER HEALTH DISTRICT REQUIREMENTS.

C. COLD AND HOT WATER SUPPLY PIPING SIZES FOR FIXTURE CONNECTIONS ARE NOT SHOWN ON PLANS. SEE FIXTURE SCHEDULE FOR CONNECTION SIZES.

D. INSTALL ALL OVERHEAD PIPING AS CLOSE TO STRUCTURE AS POSSIBLE, OR AS DETAILED OTHERWISE.

E. LOCATE AND LABEL ALL VALVES FOR SERVICE ACCESSIBILITY. VALVES INSTALLED ABOVE CEILINGS SHALL BE ACCESSIBLE THRU CEILING. SEE DRAWINGS FOR LOCATIONS.

F. COORDINATE INSTALLATION WITH THE WORK OF OTHER TRADES PRIOR TO STARTING. IN THE EVENT THAT CONFLICTS ARE FOUND WITH THE WORK OF THE OTHER TRADES, BRING ALL SUCH CONFLICTS TO THE ARCHITECT'S ATTENTION FOR RESOLUTION PRIOR TO PROCEEDING WITH THE WORK IN THAT AREA. DEFICIENCIES CAUSED BY FAILURE TO PERFORM SUCH VERIFICATIONS SHALL BE CORRECTED AT NO ADDITIONAL EXPENSE TO OWNER. IMMEDIATELY NOTIFY ARCHITECT OF CONDITIONS IN CONFLICT WITH THE PLANS.

G. PROVIDE PIPING EQUIPMENT AND MATERIALS IN ACCORDANCE WITH APPLICABLE PLUMBING CODE REGULATIONS AND STANDARDS, AUTHORITIES HAVING JURISDICTION, OR AS OTHERWISE RECOMMENDED OR DIRECTED BY MANUFACTURERS.

H. COORDINATE INSTALLATION OF PIPING BELOW AND ABOVE GRADE WITH STRUCTURAL COMPONENTS AND OTHER SYSTEM INSTALLATIONS.

I. COORDINATE ALL FIXTURES, EQUIPMENT AND ROUGH-IN CONNECTION LOCATIONS AND SIZES WITH ARCHITECTURAL DRAWINGS, OWNER AND EQUIPMENT SUPPLIER PRIOR TO INSTALLATION.

J. COORDINATE ALL FURRING REQUIREMENTS AND WALL THICKNESS WITH PIPE AND ACCESS PANEL INSTALLATIONS. COORDINATE ACCESS PANEL LOCATIONS WITH INTERIOR ELEVATIONS TO AVOID CONFLICTS WITH EQUIPMENT, GRAB BARS OR DECORATIVE ELEMENTS.

K. PROVIDE SEISMIC RESTRAINTS FOR ALL PIPE AND EQUIPMENT AS RECOMMENDED IN SMACNA "SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL EQUIPMENT", LATEST EDITION.

L. ALL PIPING SHALL BE CONCEALED IN WALLS OR ABOVE CEILINGS UNLESS NOTED OTHERWISE. ALL WALLS IN WHICH WATER OR WASTE LINES ARE INSTALLED MUST BE PATCHED TO MATCH EXISTING AFTER LINES ARE INSTALLED.

M. PRIOR TO BIDDING, OBTAIN A COPY OF THE SPECIFICATIONS AND PLANS, VISIT THE JOB SITE, TAKE NECESSARY MEASUREMENTS, NOTE EXISTING CONDITIONS, AND GATHER ALL OTHER INFORMATION NEEDED FOR AN ACCURATE BID. NO ALLOWANCES WILL BE MADE FOR EXTRA COSTS RESULTING FROM FAILURE TO NOTE EXISTING CONDITIONS.

N. PIPING PENETRATIONS THROUGH RATED ASSEMBLIES SHALL BE FIRESTOPPED IN ACCORDANCE WITH APPLICABLE CODES.

O. ALL WORK ON THE PLUMBING DRAWINGS SHALL BE COMPLETED BY THE PLUMBING CONTRACTOR UNLESS SPECIFIED OTHERWISE.

P. ANY DISCREPANCIES OR INADEQUACIES BETWEEN THE PLUMBING DRAWINGS AND OTHER DISCIPLINES SHALL BE BROUGHT TO THE ATTENTION OF OWNER'S REPRESENTATIVE.

Q. INSTALL ALL PIPING RUNS AS HIGH AS POSSIBLE THROUGHOUT ENTIRE BUILDING. INSTALL LONG RUNS WITHIN JOIST SPACE AND OTHER PIPING TIGHT TO BOTTOM OF STEEL. COORDINATE WITH OTHER TRADES – DUCTWORK, FIRE PROTECTION, PIPING, LIGHTING SYSTEMS, ETC.

R. REFER TO SPECIFICATIONS FOR ALL PIPING MATERIALS AND SERVICES.

SHEET NOTES

1. DEMOLISH EXISTING LAVATORY AND WATER CLOSET AS SHOWN SHADED AND REMOVE OFF SITE. CAP THE WASTE PIPING BELOW FLOOR AND THE VENT PIPING ABOVE CEILING CLOSE TO MAIN. PRESERVE THE LAVATORY WASTE AND VENT PIPING FOR REUSE. VERIFY EXACT DEMO REQUIREMENTS IN FIELD PRIOR TO START OF WORK.
2. DEMOLISH EXISTING WATER LINE AS SHOWN SHADED AND REMOVE OFF SITE. VERIFY EXACT DEMO REQUIREMENTS IN FIELD PRIOR TO START OF WORK.
3. ROUTE INDIRECT WASTE FROM WATER SOFTENER AND DISCHARGE INDIRECT TO ADJACENT APPROVED RECEPTOR. SLOPE AT 1/4" PER FOOT. SIZE WASTE PIPING PER THE MANUFACTURER'S REQUIREMENTS.
4. CONNECT NEW WASTE LINE TO EXISTING LAVATORY WASTE LINE STUBBED OUT OF WALL. VERIFY EXACT SIZE AND LOCATION OF EXISTING PIPING IN FIELD PRIOR TO START OF WORK.
5. CONNECT NEW WASTE PIPING TO EXISTING LAVATORY WASTE PIPING STUBBED OUTSIDE OF WALL. EXTEND NEW PIPING FROM STUB, TURN 90 DEGREES, AND TERMINATE WITH P-TRAP AND 3" TO 2" REDUCER FOR WATER SOFTENER DRAINING. TERMINATE REDUCER IN AN ACCESSIBLE LOCATION NEAR WATER SOFTENER.
6. CONNECT NEW WATER PIPING TO EXISTING PIPING. VERIFY EXACT SIZE, LOCATION AND CONNECTION REQUIREMENTS IN FIELD PRIOR TO START OF WORK.
7. ROUTE NEW WATER OR GAS PIPING OVERHEAD. COORDINATE ROUTING WITH STRUCTURE AND DUCTWORK LAYOUT PRIOR TO CONSTRUCTION.
8. PROVIDE AND INSTALL A COMPLETE WATER SOFTENING SYSTEM FOR WHOLE BUILDING APPLICATION. ROUTE UNSOFTENED CITY WATER TO EXTERIOR WALL MOUNTED HOSE BIBBS, ELECTRIC WATER COOLERS, AND ICE MAKERS ONLY. PROVIDE FOR AND COORDINATE ALL WORK WITH VENDOR'S FACTORY REPRESENTATIVE INCLUDING ALL WATER TESTING AND COMMISSIONING.
9. BRINE TANK FURNISHED AND INSTALLED WITH THE WATER SOFTENER.
10. SPLIT EXISTING CW OUTLET AT SHUTOFF VALVE SERVING EXISTING COUNTER MOUNTED SINK. ROUTE ONE LINE TO EXISTING SINK FAUCET AND THE OTHER LINE TO THE NEW RO SYSTEM. SIZE WATER LINE SERVING NEW RO SYSTEM PER THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
11. INSTALL THE NEW RO SYSTEM UNDER SINK IN AN ACCESSIBLE LOCATION PER THE MANUFACTURER'S INSTALLATION REQUIREMENTS. PROVIDE ALL PIPING AND EQUIPMENT FOR A COMPLETE INSTALLATION.
12. INSTALL THE RO FAUCET ON THE EXISTING SINK IN THE LOCATION SHOWN. COORDINATE THE EXACT LOCATION WITH THE OWNER PRIOR TO CONSTRUCTION.
13. CONNECT IW LINE FROM RO SYSTEM TO EXISTING SINK OUTLET PER THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
14. INSTALL WF-1 AT 5'-0"AFF TO TOP OF FILTER.
15. NEW PLUMBING EQUIPMENT. VERIFY EXISTING RECEPTACLE IS LOCATED WITHIN 6 FEET. IF NECESSARY, FURNISH AND INSTALL RECEPTACLE. INTERCEPT NEAREST CIRCUIT CAPABLE OF ACCEPTING ADDITIONAL LOAD AND EXTEND TO NEW RECEPTACLE. VERIFY GFCI PROTECTION EITHER AT THE RECEPTACLE OR AT THE BREAKER.
16. DEMOLISH ALL EXISTING GALVANIZED WATER PIPING FROM THIS POINT DOWN STREAM IN THE ENTIRE PIPING SYSTEM AND REMOVE OFF SITE. REPLACE GALVANIZED PIPING WITH NEW COPPER PIPING PER SPECIFICATION. FURNISH ALL PIPING, FITTINGS, VALVES, TEMPERATURE GAGES, PRESSURE GAGES, AND OTHER ITEMS REQUIRED FOR A COMPLETE INSTALLATION THAT MATCHES THE ORIGINAL PIPING INSTALLATION.
17. INSTALL ONE BYPASS AND TWO SHUTOFF VALVES AS SHOWN. OPEN BYPASS VALVE AND CLOSE THE TWO SHUTOFF VALVES DURING CONSTRUCTION TO ALLOW THE SHOP WATER SYSTEM TO CONTINUE OPERATING.

PROFESSIONAL ENGINEER REGISTERED 10955 STATE OF IDAHO KENT R. ANDERSON

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PROJECT	DATE
24086	08-16-24
DRAWN	CHECKED
KRA	KRA

REVISED

SHEET TITLE
PLUMBING PLAN

SHEET
P001

ORIGINAL SHEET SIZE 24" x 36"

WATER FILTER SCHEDULE

MARK	BASIS OF DESIGN		LOCATION	DETAIL REFERENCE	SYSTEM SERVED	TYPE	FLOW RATE GPM	PRES. DROP PSI	NUMBER OF CARTREGES	CONNECTIONS IN	REMARKS
	MFR	MODEL									
WF-1	CULLIGAN	MS040955	(E)RESTROOM	P011-1	DOMESTIC WATER	HIGH-FLOW POLYPROPYLENE	15	2	1	1	1

REMARKS:
1. FURNISH FILTER WITH 20" HOUSING, PRESSURE RELIEF BLEED INLET ON SIDE OF CAP, AND HIGH-FLOW POLYPROPYLENE FILTER.

WATER SOFTENER SCHEDULE

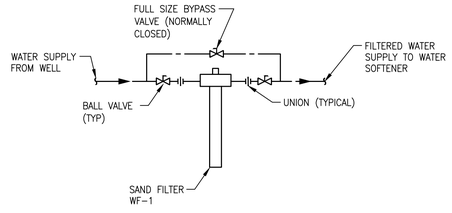
REFERENCE						PERFORMANCE					ELECTRICAL		
MARK	ITEM	BASIS OF DESIGN		TYPE	LOCATION	DETAIL REFERENCE	RESIN VOLUME CU. FT.	FLOW RATE / PRES DROP GPM / PSI	BRINE TANK			VOLTS	PHASE	REMARKS
		MFR	MODEL						DIA. IN	HEIGHT IN	CAP. LBS			
WS-1	WATER SOFTENER	CULLIGAN	AQUASENTIAL 10"	SIMPLEX	(E)RESTROOM	P011-2	10	21 / -	18	43	375	120	1	1, 2, 3, 4

REMARKS:
1. PROVIDE SYSTEM WITH AUTOMATIC BYPASS VALVE, SOFT-MINDER WATER USE METER, BACK-LIT DISPLAY, DIAL-A-SOFTNESS CONTROL, PROPORTIONAL BRINING, AQUA-SENSOR TECHNOLOGY, SALT LEVEL MONITOR, LEAK SENSOR, AND BRINE SYSTEM.
2. PROVIDE ALL PIPE REDUCERS, FITTINGS, AND COMPONENTS AS NECESSARY FOR A COMPLETE INSTALLATION.
3. ALL COMPONENTS SHALL BE FURNISHED BY THE PLUMBING CONTRACTOR AND INSTALOLED BY THE LOCAL RO VENDER.
4. CONNECT SOFTENER SYSTEM TO NEAREST WALL ELECTICAL OUTLET.

REVERSE OSMOSIS WATER SYSTEM SCHEDULE

REFERENCE					PERFORMANCE		CONNECTIONS		ELECTRICAL			
MARK	ITEM	BASIS OF DESIGN		LOCATION	FLOW GAL / DAY	PRES. DROP PSI	CW IN	WASTE IN	POWER W	VOLTS	PHASE	REMARKS
		MFR	MODEL									
RO-1	REVERSE OSMOSIS WATER SYSTEM	CULLIGAN	AQUASENTIAL SMART RO	(E)RESTROOM	75	-	-	-	20	120	1	1, 2, 3, 4

REMARKS:
1. FURNISH WITH FILTER MANIFOLD ASSEMBLY, DESIGNER FAUCET WITH ELECTRONIC DISPLAY, BUILT-IN QUALITY MONITOR, SEDIMENT AND CARBON FILTER, REVERSE OSMOSIS FILTTER, ARSENIC FILTER, MINIERAL BOOST CARTRIDGE, 3 GAL RESERVOIR TANK, AND 12V TO 120V PLUG-IN POWER SUPPLY.
2. PROVIDE ALL PIPE REDUCERS, FITTINGS, AND COMPONENTS AS NECESSARY FOR A COMPLETE INSTALLATION.
3. ALL COMPONENTS SHALL BE FURNISHED BY THE PLUMBING CONTRACTOR AND INSTALOLED BY THE LOCAL RO VENDER.
4. CONNECT SOFTENER SYSTEM TO NEAREST WALL ELECTICAL OUTLET.

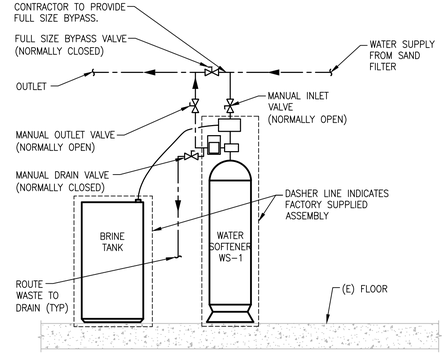


NOTE:

1. MOUNTING HEIGHT SHALL BE APPROXIMATELY 4'-0" ABOVE FINISHED FLOOR. COORDINATE WITH EQUIPMENT LAYOUT. ENSURE CLEARANCE FOR MAINTENANCE AND EQUIPMENT FUNCTION.

1 WATER FILTER DETAIL
SCALE: NTS

NOTES:
1. PLUMBING CONTRACTOR SHALL PARTICIPATE IN COMMISSIONING THE SOFTENING SYSTEM WITH VENDOR AND VERIFY THAT THE SYSTEM IS FUNCTIONING PROPERLY AND WITHIN MANUFACTURER'S PRODUCT SPECIFICATIONS.
2. UNIONS SHALL BE LOCATED ON INLET AND OUTLET CONNECTIONS OF CONTROL VALVE TO FACILITATE SERVICING.
3. THE USE OF DISSIMILAR METALS IN A PIPING SYSTEM IS NOT RECOMMENDED. WHERE DISSIMILAR METALS MUST BE CONNECTED IN A WATER SYSTEM THE USE OF NONCONDUCTIVE (DIELECTRIC) FITTINGS MAY REDUCE GALVANIC CORROSION.
4. AN ELECTRICAL OUTLET SHOULD BE PROVIDED WITHIN 5 FEET OF OF THE EQUIPMENT LOCATION.
5. ALLOW A MINIMUM OF 24 INCHES ABOVE SOFTENER FOR FILLING.
6. TO PERMIT THE OBSERVATION OF THE DRAIN FLOW DO NOT MAKE A DIRECT CONNECTION TO THE DRAIN. PROVIDE AN AIR GAP OF AT LEAST 4 TIMES THE DIAMETER OF THE DRAIN PIPE OR CONFORM TO LOCAL SANITATION CODES.
7. SYSTEM USES FRP TANKS AND MUST NOT BE SUBJECT TO VACUUM. INSTALL A SIPHON BREAK ON DRAIN LINE. INSTALL VACUUM BREAKER ON INLET PIPING IF THE SERVICE LINE IS SUBJECT TO A VACUUM.



2 WATER SOFTENER INSTALLATION DETAIL
SCALE: NTS

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PROJECT	DATE
24086	08-16-24
DRAWN	CHECKED
KRA	KRA

REVISED

SHEET TITLE
PLUMBING PLAN

SHEET
P011

ORIGINAL SHEET SIZE
24" x 36"

SECTION 220500 – BASIC MECHANICAL REQUIREMENTS

PART 1 – GENERAL

1.1 GENERAL

A. REFER TO THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, AND DIVISION 1 GENERAL REQUIREMENTS.

1.2 SCOPE OF WORK

A. PROVIDE ALL DETAILED DESIGN AND COORDINATION, LABOR, EQUIPMENT, AND MATERIALS THAT ARE REQUIRED TO PROVIDE A COMPLETE INSTALLATION AND COMPLETE OPERATING SYSTEM(S) AS INDICATED ON THE DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS INCLUDING THAT REASONABLY INFERRED FOR PROPER EXECUTION OF WORK AND SYSTEM OPERATION.
B. PROVIDE CUTTING, PATCHING EXCAVATION AND BACK FILL AS REQUIRED FOR EXECUTION OF WORK PERFORMED UNDER THIS SECTION UNLESS SPECIFICALLY PROVIDED FOR UNDER OTHER SECTIONS.
C. COORDINATE WITH WORK PERFORMED BY OTHER SECTIONS IN ORDER TO ACCOMMODATE THE REQUIREMENTS OF THIS SECTION AND TO ENSURE ADEQUATE SPACE AND PROPER LOCATION FOR ALL NECESSARY WORK ON THIS PROJECT WHETHER OR NOT WORK IS UNDER THIS SECTION. PROVIDE COORDINATION DRAWINGS AS NECESSARY.
   1. SPACE PREFERENCE: CAREFULLY CHECK AND COORDINATE THE LOCATION AND LEVEL OF ALL PIPES, DUCTS, ETC. RUN PRELIMINARY LEVELS AND CHECK OVERALL HEIGHTS SO THAT CONFLICTS IN ALL LOCATIONS MAY BE AVOIDED. WHERE CONFLICTS OCCUR, IF ANY, THE FOLLOWING PREFERENCE SCHEDULE SHALL BE FOLLOWED:
      a. RECESSED ELECTRICAL LIGHT FIXTURES.
      b. DUCTWORK.
      c. SPRINKLER PIPING.
      d. SOIL, WASTE, VENT AND STORM PIPING.
      e. REFRIGERATION PIPING.
      f. DOMESTIC WATER PIPING.
      g. ELECTRICAL CONDUITS.
   2. HOWEVER, NO DUCTWORK OR REFRIGERANT LINES SHALL HAVE PREFERENCE OVER PLUMBING LINES BELOW PLUMBING FIXTURES, OR OVER ELECTRICAL CONDUITS ABOVE OR BELOW ELECTRIC SWITCHGEAR AND PANELS. NO PIPING CONVEYING FLUIDS SHALL BE INSTALLED DIRECTLY OVER ELECTRICAL EQUIPMENT.
D. PROVIDE ALL NECESSARY RIGGING, EQUIPMENT AND MANPOWER TO SET EQUIPMENT AND MATERIALS IN PLACE AND TO REMOVE DEMOLISHED EQUIPMENT AND MATERIALS FROM THE SITE.
E. PROVIDE ALL SEISMIC RESTRAINTS REQUIRED BY CODE, FOR ALL EQUIPMENT, DUCT, PIPE, AND MATERIALS FURNISHED UNDER THIS SECTION. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE RESTRAINTS AND FOR PROOF OF ADEQUACY OF THE RESTRAINTS AND SHALL SUBMIT SIGNED SEISMIC CALCULATIONS PREPARED BY A REGISTERED CIVIL OR STRUCTURAL ENGINEER, WHERE REQUIRED.
F. PROVIDE LAYOUT OF EQUIPMENT SUPPORTS, PIPING, AND DUCTWORK.
G. PROVIDE COMPLETE START-UP, CHECK-OUT, TESTING, AIR/WATER BALANCE AND CERTIFICATION OF SYSTEMS. TEST AND BALANCE TO BE PERFORMED BY AN INDEPENDENT, QUALIFIED FIRM.
H. PROVIDE COMPLETE TEMPERATURE AND EQUIPMENT CONTROL SYSTEMS AS INDICATED.
I. PROVIDE COLD AND HOT WATER SYSTEMS, GAS, PLUMBING WASTES, VENTS, INDIRECT DRAINS, RAIN LEADERS AND CONNECTIONS TO SITE PLUMBING AS REQUIRED.
J. PROVIDE PLUMBING EQUIPMENT, FIXTURES, AND TRIM AS INDICATED HEREIN AND ON THE DRAWINGS. PROVIDE ROUGH IN AND ALL FINAL CONNECTIONS TO EQUIPMENT AND FIXTURES. PROVIDE CHROME PLATED STOPS AND SUPPLIES AND ESCUTCHEON PLATES, SERVICE STOPS, AND ACCESS PANELS FOR ALL FIXTURES AND EQUIPMENT.
K. PROVIDE ALL PLUMBING ITEMS REQUIRED FOR COMPLETE AND PROPERLY OPERATING PLUMBING INSTALLATION IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS.

1.3 CODES AND STANDARDS

A. THE WORK INSTALLED UNDER THIS SECTION SHALL CONFORM TO ALL APPLICABLE LOCAL CODES, REGULATIONS, LOCAL CODE AMENDMENTS AND STANDARDS.
B. DO NOT CONSTRUE ANYTHING CONTAINED IN THESE SPECIFICATIONS OR DRAWINGS TO PERMIT WORK TO BE INSTALLED THAT DOES NOT CONFORM TO CODE.

1.4 DRAWINGS AND SPECIFICATIONS

A. THE DRAWINGS PROVIDED ARE SCHEMATIC IN NATURE. ABSOLUTE ACCURACY OF THE DRAWINGS AND SPECIFICATIONS CAN NOT BE GUARANTEED. WHILE REASONABLE EFFORT HAS BEEN MADE TO COORDINATE THE LOCATION OF EQUIPMENT AND MATERIALS WITH THE STRUCTURE AND OTHER TRADES, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE EXACT REQUIREMENTS AND LOCATIONS AS GOVERNED BY ACTUAL JOB CONDITIONS. CHECK ALL INFORMATION AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE FABRICATION AND IN TIME TO AVOID ANY UNNECESSARY CHANGES.

1.5 GUARANTEE AND WARRANTIES

A. ALL MATERIALS, PARTS, EQUIPMENT, MODIFICATIONS MADE, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE OF WORK. SHOULD SUCH PARTS, MATERIALS, OR WORKMANSHIP BE FOUND TO BE DEFECTIVE DURING THIS PERIOD, THEY SHALL BE RECTIFIED AT NO COST TO THE OWNER.

1.6 FEES

A. PROVIDE, PROCURE, AND PAY FOR ALL PERMITS, SERVICES, METERS, LICENSES, FEES, ETC., REQUIRED FOR PERFORMANCE OR WORK OF THIS SECTION. THIS INCLUDES COORDINATION WITH UTILITY PROVIDERS FOR PROPER PHASING OF INSTALLATION.
B. UPON COMPLETION OF THE WORK, DELIVER TO THE ARCHITECT, ALL CERTIFICATES OF APPROVAL SIGNED BY THE CONTROLLING AUTHORITIES.

1.7 SUBMITTAL DATA

A. COMPLETE SUBMITTAL DATA SHALL BE FURNISHED ON ALL MECHANICAL AND PLUMBING ITEMS WHETHER AS SPECIFIED OR PROPOSED AS ALTERNATES. THE SUBMITTALS SHALL BE SUBMITTED ELECTRONICALLY.
B. EQUIPMENT, MATERIALS, AND PRODUCTS SPECIFICALLY IDENTIFIED, DESCRIBED, OR SCHEDULED ON THE DRAWINGS AND NAMED FIRST IN THE SPECIFICATIONS ARE THE BASIS OF DESIGN. THE OTHER MANUFACTURERS OR SUPPLIERS WHICH MAY BE NAMED IN THE SPECIFICATION ONLY INDICATE THE GENERAL ACCEPTABILITY OF THE MANUFACTURER OR SUPPLIER AND ARE CONSIDERED SUBSTITUTIONS.
C. THIS CONTRACTOR ASSUMES FULL RESPONSIBILITY THAT ALTERNATIVE ITEMS SUBSTITUTED FOR THE FIRST NAMED MANUFACTURER WILL MEET THE JOB REQUIREMENTS AND IS RESPONSIBLE FOR THE COST OF REDESIGN AND MODIFICATIONS NECESSARY DUE TO THIS SUBSTITUTION.

1.8 RECORD DRAWINGS

A. RECORD OF JOB PROGRESS: KEEP AN ACCURATE, DIMENSIONAL RECORD OF THE AS-BUILT LOCATIONS OF ALL WORK.
B. FINAL AS-BUILT REPRODUCIBLE DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND OWNER PRIOR TO FINAL ACCEPTANCE.

1.9 OPERATING AND MAINTENANCE INSTRUCTIONS

A. FURNISH THREE (3) COMPLETE SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL EQUIPMENT BOUND IN A RIGID BINDER AND INDEXED.

1.10 EQUIPMENT SUPPORT AND RESTRAINTS

A. GENERAL: ALL EQUIPMENT, PIPING, DUCTWORK, AND MATERIALS SHALL BE FASTENED TO THE STRUCTURE WITH PROPERLY SIZED AND STRUCTURALLY ENGINEERED ANCHORS, BOLTS, AND RESTRAINTS TO PREVENT PERMANENT DISPLACEMENT IN ANY DIRECTION CAUSED BY LATERAL MOTION, OVERTURNING, OR UPLIFT AS REQUIRED BY THE BUILDING CODE.
B. ALL ISOLATORS SHALL BE FASTENED TO THE STRUCTURE AND TO THE EQUIPMENT WITH PROPERLY SIZED AND STRUCTURALLY ENGINEERED ANCHORS AND BOLTS.
C. THE ENGINEER PROVIDING THE REQUIRED CALCULATIONS SHALL INSPECT ALL SUPPORTS AND ATTACHMENTS DESIGNED BY HIM AND PROVIDE A LETTER TO ARCHITECT OF RECORD CERTIFYING THAT THEY HAVE BEEN INSTALLED AS DESIGNED.

1.11 RELATED WORK SPECIFIED ELSEWHERE

A. THE FOLLOWING ITEMS ARE TO BE INCLUDED IN OTHER SECTIONS TO BE DONE BY OTHER TRADES. WHERE COORDINATION IS NECESSARY, THIS CONTRACTOR SHALL PROVIDE IT.
   1. ALL ELECTRICAL POWER WIRING INCLUDING FIELD CONNECTIONS.
   2. PAINTING AND PATCHWORK.
   3. STRUCTURAL INTERFERENCE AND PENETRATIONS.

1.12 START-UP SERVICES

A. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER OPERATION OF ALL SYSTEMS, MINOR SUBSYSTEMS, AND SERVICES PROVIDED UNDER THIS DIVISION. HE SHALL COORDINATE START-UP PROCEDURES, CALIBRATION, AND SYSTEM CHECK-OUT WITH ALL SUBCONTRACTOR AND TRADES INVOLVED. ANY SYSTEM OPERATIONAL PROBLEMS SHALL BE DIAGNOSED AND ALL CORRECTIONAL PROCEDURES SHALL BE INITIATED WITH THE VARIOUS SUBCONTRACTORS AS REQUIRED TO BRING THE SYSTEM INTO COMPLIANCE WITH THE DESIGN INTENT.
B. PERSONNEL PERFORMING START-UP SERVICES SHALL BE FULLY QUALIFIED, EXPERIENCED, AND NORMALLY ENGAGED IN THIS TYPE OF WORK. IF THE CONTRACTOR DOES NOT HAVE SUCH PERSONNEL AVAILABLE FROM HIS OWN COMPANY, HE SHALL HIRE, AT HIS OWN EXPENSE, SUBCONTRACTORS WHO ARE QUALIFIED.
C. THE CONTRACTOR SHALL CHECK ALL EQUIPMENT DURING THE INITIAL START-UP TO ENSURE PROPER OPERATION, ADEQUATE FLUIDS AND WATER FLOWS OR AIR FLOWS, AND VIBRATION ISOLATION. SYSTEMS SHALL BE CHECKED FOR AIR AND/OR WATER FLOWS THROUGHOUT WITHOUT BLOCKAGES. AIR HANDLING SYSTEMS SHALL BE CHECKED FOR PROPER DAMPER CONNECTIONS AND POSITIONS, AND MINIMAL VIBRATION. OTHER MISCELLANEOUS EQUIPMENT SHALL BE STARTED AND OPERATED AS DESCRIBED ABOVE AS APPLICABLE.
D. A FINAL AND COMPLETE START-UP AND BALANCE REPORT SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE AND PAYMENT. THIS REPORT SHALL BE SIGNED BY EACH PERSON DOING THE START-UP TASK AND BY THE RESPONSIBLE FIELD PERSON. REPORT SHALL INCLUDE, BUT NOT BE LIMITED TO: DATE OF TEST; DATE OF LAST CALIBRATION; TEMPERATURES; HUMIDITIES; SET POINTS; RPM; VOLTAGE, AMPERAGE; PRESSURES; STABILITY; SUPPLY, RETURN AND OUTSIDE AIRFLOWS AT EACH UNIT AND EACH UNIT AND EACH TERMINAL; ETC.

END OF SECTION 220500

SECTION 221000 – PLUMBING

PART 1 – GENERAL

1.1 GENERAL

A. REFER TO SECTION 220500 – BASIC MECHANICAL REQUIREMENTS.

PART 2 – MATERIALS

2.1 VALVES

A. ALL BALL OR BUTTERFLY VALVES FOR GENERAL USE SHALL HAVE EPT SEATS.
B. GENERAL USE VALVES:
   1. GATE VALVES:
      a. 1/2" THROUGH 2" – SWEAT: STOCKHAM FIGURE B-108.
      b. 1/2" THROUGH 2" – THREADED: STOCKHAM FIGURE B-105.
      c. 2-1/2" AND ABOVE – FLANGED: STOCKHAM FIGURE G-634 BRONZE FITTED.
   2. BALL VALVES – 1/2" THROUGH 2": HAMMOND 8000 SERIES.
   3. PRESSURE REDUCING VALVES: 2" AND SMALLER – THREADED: BRONZE CONSTRUCTION, WATTS ULSB.
   4. SAFETY AND RELIEF VALVES: WATTS NO. 740 SERIES OR WATTS NO. 1744 SERIES.
   5. CROSS CONNECTION CONTROL: PROVIDE BACKFLOW PREVENTION IN ACCORDANCE WITH CODE FOR EACH PIECE OF EQUIPMENT CAPABLE OF CONTAMINATING THE POTABLE WATER SYSTEM. WHERE PERMITTED BY CODE, VACUUM BREAKERS MAY BE USED. USE BACKFLOW PREVENTERS IN ALL OTHER INSTANCES.
C. MANUFACTURERS: HAMMOND, LEGEND, STOCKHAM, WATTS, NIBCO, WILKINS.

2.2 PIPES AND FITTINGS

A. SANITARY SOIL, WASTE, VENT SYSTEM:
   1. UNDERGROUND:
      a. CAST IRON: ASTM A888 OR CISPI 301, SOIL, BELL AND PLAIN END WITH NEOPRENE COMPRESSION GASKETS. AB&I COUPLINGS OR "HUSKEY" COUPLINGS ARE ACCEPTABLE ALTERNATES. WRAP WITH "CALPICO" TAPE PER MANUFACTURER'S INSTRUCTION.
      b. (CONTRACTOR'S OPTION) WHEN CONCEALED ABOVE CEILING (NON-RETURN AIR PLENUM), IN WALLS OR BELOW SLAB, PVC; ASTM D2665/F891 SCHEDULE 40 DWV PIPING WITH SOLVENT WELD FITTINGS MAY BE USED, UNLESS SHOWN OTHERWISE, IF ALLOWED BY LOCAL GOVERNING AUTHORITIES. TRANSITION OF MATERIALS SHALL OCCUR BELOW SLAB OR ABOVE CEILING. FLOOR AND WALL CLEANOUTS SHALL BE CAST IRON AS HEREAFTER SPECIFIED.
   2. ABOVEGROUND:
      a. CAST IRON; ASTM A888 OR CISPI 301, SOIL, PLAIN END (NO HUB).
      b. (CONTRACTOR OPTION) DWV COPPER; ASTM B306 OR STEEL ASTM A53, WITH DRAINAGE PATTERN FITTINGS MAY BE USED FOR PIPE SIZES 2-1/2" AND SMALLER.
   3. ALL VENT PIPING PROTRUDING THROUGH THE ROOF SHALL BE RESISTANT TO UV RADIATION.
B. POTABLE WATER:
   1. ABOVE GRADE: COPPER; ASTM B88, PRESSURE TYPE L; JOINTS SILVABRITE 100, 95 % TIN, 4 % COPPER, 0.5 % SILVER SOLDER, AND NON CORROSIVE, WATER-SOLUBLE FLUX.
   2. UNDERGROUND: COPPER; PRESSURE TYPE K; ASTM B88, BRAZED JOINTS; BCUP SERIES COPPER PHOSPHORUS ALLOY BRAZED. MACHINE WRAP ALL UNDERGROUND PIPING WITH "3M" PIPE WRAP. DOUBLE HAND WRAP ALL JOINTS AND FITTINGS.
C. CONDENSATE:
   1. EXTERIOR OR RETURN AIR PLENUM: COPPER; TYPE M; ASTM B75, SOLDER JOINTS, ALLOY GRADE 95% TIN, 5% ANTIMONY.
   2. INTERIOR OR DUCTED RETURN: PVC, ASTM D2665, SOLVENT WELD JOINTS.

2.3 PIPING SPECIALTIES

D. THERMOMETERS AND WELLS: WEKSLER TYPE A, "ADJUST-ANGLE", 5" DIAL BIMETAL THERMOMETER.
E. PRESSURE GAUGES: WEKSLER MODEL BA13P OR EQUAL WEISS, MARCH, OR ASHCROFT, 3-1/2" DIAMETER PHENOLIC CASE WITH BLACK NUMERALS ON WHITE FACE. INSTALL WITH BOLTON #B2505FF BAR STOCK NEEDLE VALVE. SELECT DIAL RANGE SO THAT THE NORMAL OPERATING PRESSURE WILL OCCUR AS CLOSE TO THE MIDPOINT OF THE DIAL RANGE AS POSSIBLE.
F. TEMPERATURE AND PRESSURE TEST STATION: 1/4" OR 1/2" MPT "PETE'S PLUG" WITH SOLID BRASS FITTING CAP ON ALL SUPPLY AND RETURN PIPING TO EACH PIECE OF MECHANICAL EQUIPMENT.
G. AIR VENTS: HOFFMAN #79 WHERE AUTOMATIC TYPE IS SHOWN UNLESS SPECIFIED OTHERWISE. INSTALL WITH BOLTON #B2505FF BAR STOCK NEEDLE VALVE. PROVIDE BOLTON #B2505FF BAR STOCK NEEDLE VALVE COCK FOR MANUAL AIR VENT AT COILS AND AT EACH HIGH POINT IN PIPING SYSTEMS.
H. FLEXIBLE PIPE CONNECTORS: FLEX HOSE, T-FLEX OR FLEXZORBER JOINTS, ARCH TYPE CONSTRUCTION OF MOLDED NEOPRENE ELASTOMER OR TEFLON, COMPLETE WITH LIMIT BOLTS AND TIE RODS (MASON MFNC OR APPROVED SUBSTITUTION).

2.4 PIPE INSULATION

A. PIPE INSULATION
   1. PREFORMED MINERAL-FIBER PIPE INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN COMPLYING WITH ASTM C547, TYPE 1, WITH FACTORY-APPLIED, ALL-PURPOSE, VAPOR-RETARDER JACKET.
   2. APPLICATION: REFER TO THE PLUMBING PIPING INSULATION SCHEDULE FOR ALL PIPE INSULATION APPLICATIONS AND SIZES.
   3. INSULATION INSTALLED INDOORS SHALL HAVE A FLAME/SMOKE SPREAD INDEX OF 25/50 OR LESS.

2.5 EQUIPMENT, PIPE SUPPORTS AND PENETRATIONS

A. ALL ROTATING EQUIPMENT AND EQUIPMENT CAPABLE OF TRANSMITTING VIBRATION INTO THE SPACE SHALL BE MOUNTED ON VIBRATION ISOLATORS AND BASES OR AS SHOWN ON DRAWINGS. THE ISOLATORS AND BASES SHALL BE PROPERLY SIZED BY THE ISOLATOR MANUFACTURER, TAKING INTO ACCOUNT THE PIECE OF EQUIPMENT AND THE STRUCTURE UPON WHICH IT IS SETTING, SO THAT VIBRATION TRANSMITTED TO THE STRUCTURE IS HELD TO AN ACCEPTABLE LEVEL.
B. OPEN SPRINGS WITH SEPARATE SNUBBERS MAY ALSO BE USED.
C. THE BASES AND ISOLATORS SHALL BE AS MANUFACTURED BY MASON, KINETICS, SAUSSE, OR AMBER/BOOTH.
D. ALL ISOLATORS SHALL BE PROPERLY ADJUSTED SO THAT EQUIPMENT IS LEVEL, SNUBBERS AND SEISMIC TYPE MOUNTS ARE CENTERED, AND NO SHORT CIRCUITING OCCURS.
E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND SIZING ALL PIPING SUPPORTS, HANGERS, AND ACCESSORIES INCLUDING ALL ATTACHMENTS TO THE STRUCTURE.
F. PROVIDE PIPE SHIELDS ANCHORS, GUIDES, AND SUPPORTS EQUAL TO GRINNELL, ELCEN, SUPERSTRUT, UNISTRUT.
G. ALL HANGERS, SUPPORTS, ANCHORS, GUIDES, AND STRUCTURAL ATTACHMENTS SHALL BE INSTALLED ACCORDING TO GOOD STANDARD PRACTICE AND ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
H. USE CADMIUM PLATED OR GALVANIZED HANGERS, ATTACHMENTS, RODS, NUTS, BOLTS, AND OTHER ACCESSORIES.
I. ON PIPES 1-1/4" AND SMALLER THAT ARE INSULATED, RUN THE INSULATION CONTINUOUS THROUGH THE HANGER AND PROVIDE GRINNELL (TYCO) FIGURE 167 (OR EQUIVALENT) GALVANIZED SHEET METAL SHIELDS UNDER THE INSULATION TO PREVENT CRUSHING.
J. ON PIPES 1-1/2" AND LARGER THAT ARE INSULATED, PROVIDE PIPE SHIELDS, INC., INSULATED PIPE SUPPORTS.
K. ALL ROOFTOP PIPING (GAS, COND. DRAIN, ETC.) IS TO BE SUPPORTED BY ADJUSTABLE PIPE SUPPORTS (MIRO, VERSABLOCK, ETC.). WOOD SUPPORTS ARE UNACCEPTABLE.

2.6 DRAINAGE SPECIALTIES

A. CLEANOUTS: PROVIDE WHERE SHOWN AND AS REQUIRED; TYPES AND SIZES AS SCHEDULED. PROVIDE LUBRICATION ON CLEANOUT THREADS AND PROVIDE OWNER WITH THREE (3) CLEANOUT PLUG REMOVAL TOOLS.
   1. WALL CLEANOUT: WITH STAINLESS STEEL COVER.
   2. FLOOR CLEANOUT: WITH NICKEL BRONZE TOP AND CARPET RING (AS REQUIRED).
   3. GRADE CLEANOUT (CCO) SHALL BE SUPPLIED WITH HEAVY DUTY CAST IRON TOP.
   4. MANUFACTURERS: JR SMITH, ZURN, JOSAM, WADE.
B. FLOOR DRAINS/ FLOOR SINKS: CAST IRON BODY WITH INTEGRAL STRAINER, AND NICKEL BRONZE RIM AND TOP COVER.
   1. ACID RESISTANT INTERIOR COATING AT SANITARY LOCATIONS.
   2. TRAP PRIMER CONNECTIONS.
   3. MANUFACTURERS: JR SMITH, ZURN, JOSAM, WADE, COMMERCIAL ENAMEL.

2.7 FIXTURE SUPPORTS

C. GENERAL: PROVIDE PLUMBING FIXTURE CARRIERS, SUPPORTS, AND DEVICES TO CARRY LOADS INDEPENDENTLY OF WALLS OR PARTITIONS. SECURELY BOLT SUPPORTS TO FLOOR WITH POWER-DRIVEN OR DRILLED INSERTS OR STUDS.
D. MANUFACTURER: J.R. SMITH, JOSAM, WADE, OR ZURN.

2.8 PLUMBING FIXTURES

A. FIXTURE SCHEDULE: FURNISH AND INSTALL AS INDICATED ON THE DRAWINGS. WATER SAVER FIXTURES AND ACCESSORIES SHALL HAVE A PROVEN TRACK RECORD IN THE FIELD.
   1. MANUFACTURERS: AMERICAN STANDARD, KOHLER, ZURN, ELKAY, JUST, HAWS, BEST BATH, AQUAGLASS, FIAT, BRADLEY.
B. PROVIDE TRAP PRIMERS AT ALL FLOOR DRAINS AND FLOOR SINKS AS INDICATED ON THE DRAWINGS.
   1. MANUFACTURERS: PPP, JR SMITH, ZURN, SIOUX CHIEF.
C. FIXTURE SUPPLIES AND STOPS:
   1. GENERAL: ALL SUPPLIES AND STOPS SHALL BE NEW. PROVIDE CHROME PLATED ESCUTCHEONS AT ALL WALL PENETRATIONS. INSULATE ALL SUPPLIES AND STOPS PER ADA STANDARDS.
   2. MANUFACTURERS: BRASSCRAFT, EASTMAN, WATTS, MCGUIRE.
F. FIXTURE COLOR (UNLESS SELECTED BY ARCHITECT): WHITE. TRIM FINISH: POLISHED CHROME PLATED.
G. TRAPS: 17 GAUGE CHROME PLATED WITH CHROME PLATED ESCUTCHEONS AT WALL PENETRATIONS.

2.9 WATER SOFTENERS:

A. SALT-BASED ION-EXCHANGE WATER SOFTENER:
   1. TYPE: SEPARATE ION EXCHANGE AND FEED TANKS.
   2. TANK MATERIALS: EPOXY LINED STEEL ION EXCHANGE WITH ONE-PIECE RESIN FOR FEED.
   3. SOLENOID VALVES: BRASS OR OTHER PROCESS-RESISTANT SUITABLE MATERIAL.
   4. TIME-BASED CONTROLLER FOR SOFTENING AND BACKWASHING CYCLES WITH DIGITAL DISPLAY.

PART 3 – EXECUTION

3.1 WATER SOFTENER

A. INSTALL WATER SOFTENER EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, AS REQUIRED BY CODE, AND COMPLYING WITH CONDITIONS REQUIRED FOR APPLICABLE CERTIFICATIONS.
B. COORDINATE SYSTEM, EQUIPMENT, AND PIPING WORK WITH APPLICABLE ELECTRICAL, DRAIN, AND WASTE SUPPORT INTERCONNECTIONS AS INCLUDED OR PROVIDED BY OTHER TRADES.

3.2 GENERAL PIPING

A. CUT PIPING ACCURATELY TO JOB MEASUREMENTS AND INSTALL WITHOUT SPRINGING OR FORCING, TRUE TO LINE AND GRADE, GENERALLY SQUARE WITH BUILDING AND ADEQUATELY SUPPORTED TO PREVENT SAGGING OR UNDUE STRESS ON PIPE, FITTINGS, AND ACCESSORIES.
B. THOROUGHLY CLEAN ALL PIPE AND MAINTAIN IN SUCH CONDITION THROUGHOUT CONSTRUCTION. TEMPORARILY CAP OFF OR PLUG ENDS OF UNPROTECTED PIPE.
C. ARRANGE PIPING AND HANGERS TO ALLOW FOR EXPANSION, CONTRACTION, AND STRUCTURAL SETTLEMENT. DO NOT INSTALL PIPING IN CONTACT WITH THE BUILDING STRUCTURE. ANCHOR PIPES PROPERLY SO EXPANSION/CONTRACTION IS CONTROLLED.
D. "BULL HEAD" TEES SHALL NOT BE INSTALLED.
E. FLUSH ALL PIPES FREE FROM FOREIGN SUBSTANCES BEFORE INSTALLING VALVES, STOPS, OR MAKING FINAL CONNECTIONS.
F. INSTALL PIPING AT THE COILS SO THAT COILS CAN BE REMOVED WITH A MINIMUM OF PIPE DISLOCATION. ALL FITTINGS, ETC., SHALL BE READILY ACCESSIBLE.
G. VICTAULIC COUPLINGS WITH GROOVED PIPING MAY BE USED ON EXPOSED PIPING SECTIONS IN LIEU OF WELDED JOINTS. OPTION WILL REQUIRE ADDITIONAL SUPPORTS TO PREVENT SAGGING OF PIPE.
H. PROVIDE A SUPPORT OR HANGER CLOSE TO EACH CHANGE OF DIRECTION IN THE PIPE, EITHER HORIZONTAL OR VERTICAL.

3.3 PIPE TESTING

A. TEST ALL PRESSURE PIPING AT 150 PSIG FOR 4 HOURS WITH NO LEAK OR LOSS OF PRESSURE. REPAIR OR REPLACE DEFECTIVE PIPING UNTIL TESTS ARE ACCOMPLISHED SUCCESSFULLY.
B. WASTE, VENT, AND CONDENSATE – FILL TO TOP OF HIGHEST VENT WITH WATER FOR 4 HOURS WITH NO LOSS OF HEIGHT. REPAIR OR REPLACE DEFECTIVE PIPING UNTIL TESTS ARE ACCOMPLISHED SUCCESSFULLY.
C. FUEL GAS PIPING – PRIOR TO INITIAL OPERATION, TEST AND PURGE FUEL GAS PIPING IN ACCORDANCE WITH ANSI Z223.1. REPAIR OR REPLACE DEFECTIVE PIPING UNTIL TESTS ARE COMPLETED SUCCESSFULLY.

3.4 IDENTIFICATION

A. PIPING:
   1. IDENTIFY ALL PIPELINES WITH ADHESIVE MARKERS INDICATING THE CONTENTS AND DIRECTION OF FLOW.
   2. MANUFACTURERS: SETON TYPE SETMARK, BRADY, OR PERMA-COLOR.
   3. PROVIDE PIPE MARKING AS FOLLOWS:
      a. PROVIDE AT EACH END OF EACH MARKER, BRADY OR EQUAL, 2-1/4" WIDE SELF-STICKING CLEAR TAPE AROUND THE PERIPHERY OF PIPE OR INSULATION TO FURTHER SECURE THE MARKER. ALL MARKERS SHALL BE INSTALLED AFTER FINISH PAINTING IS COMPLETE. COAT FULL MARKER WITH CLEAR LACQUER AFTER INSTALLATION.
      b. GUARANTEE THAT "PIPE MARKERS" WILL STAY ON PIPE SYSTEMS FOR A PERIOD OF NOT LESS THAN 5 YEARS.
      c. IDENTIFY PIPING 2-1/2" AND SMALLER WITH 1" MINIMUM HEIGHT LETTERING EVERY 20' WHERE EXPOSED TO VIEW AND AT VALVES WHERE CONCEALED.
      d. IDENTIFY PIPING 3" AND LARGER WITH 2" MINIMUM HEIGHT LETTERING EVERY 30' WHERE EXPOSED TO VIEW AND AT VALVES WHERE CONCEALED.
      e. WHERE PIPING IS PROVIDED WITH INSULATION, PROVIDE THE SIZE LETTERS SCHEDULED ABOVE IN ACCORDANCE WITH THE OUTSIDE DIMENSIONS OF INSULATION.
B. EQUIPMENT IDENTIFICATION: IDENTIFY EACH NEW AND EXISTING EQUIPMENT WITH LAMINATED BLACK PLASTIC TAGS WITH ENGRAVED WHITE CORE LETTERING. USE TAGS WITH A MINIMUM THICKNESS OF 1/16", A MINIMUM SIZE OF 1-1/2" X 4", AND WITH 1" HIGH LETTERING. ACCEPTABLE MANUFACTURERS: SETON, W.W. WILCOX, OR BRADY. SECURE TAGS TO EQUIPMENT BY MEANS OF SCREWS OR BOLTS.
C. VOLUME DAMPER IDENTIFICATION: INDICATE DAMPER POSITION ON ALL SUPPLY DUCT VOLUME DAMPERS.

3.5 STERILIZATION OF PIPES

A. GENERAL:
   1. AFTER PRELIMINARY PURGING OF THE SYSTEM, CHLORINATE THE ENTIRE POTABLE DOMESTIC WATER SYSTEM IN ACCORDANCE WITH THE CURRENT RECOMMENDATIONS OF THE AMERICAN WATER WORKS ASSOCIATION AND IN ACCORDANCE WITH ALL PERTINENT STATE AND LOCAL HEALTH CODES AND REGULATIONS.
   2. UPON COMPLETION OF THE STERILIZATION, THOROUGHLY FLUSH THE ENTIRE POTABLE WATER SYSTEM AND IMMEDIATELY FILL THE SYSTEM.

END OF SECTION 221000

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PROJECT	DATE
24086	08-16-24
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KRA	KRA

REVISED

SHEET TITLE
PLUMBING SPECIFICATIONS

SHEET
M021

ORIGINAL SHEET SIZE 24" x 36"