

PLUMBING SPECIFICATIONS

PART 1 - PLUMBING GENERAL REQUIREMENTS:

- 1.01 PLUMBING GENERAL SPECIFICATIONS:
- CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERATING SYSTEM, INCLUDING ALL REQUIRED ACCESSORIES. ALL SYSTEMS SHALL BE FULLY CLEANED, TESTED, BALANCED AND READY FOR OWNER OCCUPANCY, WITH COMPLETE CERTIFIED TESTING AND BALANCING REPORT. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL. FOR ALL EQUIPMENT INDICATED BY (S) CONTRACTOR SHALL PROVIDE OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT MARKED WITH (O/M), BOUND IN A SINGLE BINDER, COMPLETE WITH INDEX, TO THE ENGINEER FOR REVIEW AND TRANSMITTAL TO THE OWNER.
  - THE COMPLETED PLUMBING INSTALLATION AND ALL MATERIALS AND EQUIPMENT SHALL CONFORM TO ALL LOCAL ORDINANCES, CODES, AND OTHER REGULATIONS AND STANDARDS THAT ARE APPLICABLE. THESE ARE INTENDED AS A MINIMUM AND SHALL BE EXCEEDED IF REQUIRED BY THE SPECIFICATIONS OR THE DRAWINGS. IN THE EVENT OF CONFLICT BETWEEN THE CODES, STANDARDS, OR REGULATIONS CONTAINED IN THE CONTRACT DOCUMENTS, THE APPLICABLE CODE, STANDARDS, OR REGULATION SHALL TAKE PRECEDENCE.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND PROPER RELATION OF THE PLUMBING WORK TO THE WORK OF OTHER TRADES AND TO ACTUAL BUILDING CONDITIONS. NO ADDITIONAL COMPENSATION NOR EXTENSION OF COMPLETION TIME WILL BE GRANTED FOR EXTRA WORK CAUSED BY THE LACK OF COORDINATION. CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING BIDS TO VERIFY ALL CONDITIONS.
  - ALL CUTTING AND PATCHING FOR THE INSTALLATION OF NEW WORK IN EXISTING BUILDING SHALL BE DONE BY THE CONTRACTOR. INSTALLING THE WORK. PATCHING SHALL BE DONE BY SKILLED TRADESMEN AND FINISH SHALL MATCH ADJACENT AREAS.
  - EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS TO CONFORM WITH THE DETAILS AND APPLICATION INDICATED.
  - PROVIDE NECESSARY SUPPORTS FOR ALL EQUIPMENT AND APPURTENANCES AS REQUIRED.
  - DEMOLITION: REMOVE ALL EQUIPMENT, PIPING AND FIXTURES AS INDICATED ON THE DRAWINGS AND AS REQUIRED. DRAWINGS INDICATE A BRIEF OVERVIEW OF THE DEMOLITION AND ARE NOT INTENDED TO BE ALL INCLUSIVE. ANY ADDITIONAL EQUIPMENT AND/OR PIPING DISCOVERED DURING DEMOLITION AND NOT REUSED SHALL BE REMOVED. ALL PIPES REMAINING AFTER DEMOLITION SHALL BE CAPPED. THE OWNER SHALL SELECT AND RETAIN EQUIPMENT AND MATERIALS TO BE REMOVED AND NOT REUSED. ALL OTHER EQUIPMENT AND MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROMPTLY REMOVED FROM THE PREMISES. DEMOLITION SHALL NOT PROCEED UNTIL THE WORK SCHEDULE IS APPROVED BY THE OWNER.
  - ASBESTOS: CONTRACTOR SHALL REVIEW THE OWNER'S ASBESTOS MANAGEMENT PLAN TO ENSURE SUSPECTED ASBESTOS CONTAINING MATERIALS ARE UNDER SURVEILLANCE.
  - DISCOVERY: IF DURING THE CONSTRUCTION OF THIS PROJECT, WORK INVOLVING FRAGILE ASBESTOS IS SUSPECTED, OR ENCOUNTERED, ALL WORK IN THIS AREA SHALL BE DISCONTINUED AND THE OWNER OR THE OWNER'S REPRESENTATIVE, SHALL BE NOTIFIED IMMEDIATELY AND THE OWNER WITH HIS OWN FORCES OR BY SEPARATE CONTRACT SHALL BE RESPONSIBLE FOR COMPLETE INVESTIGATION, REMOVAL, AND DISPOSITION OF THE FRAGILE ASBESTOS HAZARD IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS.

PART 2 - PRODUCTS:

- 2.01 WATER PIPE, FITTINGS AND VALVES:
- ABOVE GROUND PIPING: TYPE "L" HARD TEMPER COPPER PIPE CONFORMING TO ASTM B88, CAST OR WROUGHT COPPER SOLDER FITTINGS CONFORMING TO ASME B16.18 OR ASME B16.22.
  - VALVES FOR USE WITH COPPER PIPE (S):
    - CUTOFF VALVES: BRONZE BODY BALL VALVE, CHROMIUM PLATED BALL, THREADED OR SOLDER ENDS, LEVER HANDLE, RATED FOR 600 PSI WOG, APOLLO 70-100/200, MILWAUKEE B4100/B4150, NIBCO T-5-585-70 OR ACCEPTED EQUAL.
    - CUTOFF AND DRAIN VALVES: BRONZE BODY BALL VALVE, CHROMIUM PLATED BALL, THREADED ENDS, DRAIN WITH CAP, RATED FOR 400 PSI WOG, APOLLO 95-100, HAMMOND 8701, WAITS B-6300, SERIES OR ACCEPTED EQUAL. CUTOFF VALVES AS LISTED ABOVE USED WITH A SEPARATE 3/8" NPT. INSTALLED IN LINE AS THE DRAIN VALVE MAY BE USED IN LIEU OF THE VALVE WITH DRAIN PLUG.
    - CHECK VALVES: BRONZE, "Y" PATTERN SWING CHECK, BRONZE DISC AND SEAT, THREADED OR SOLDER ENDS, RATED FOR 200 PSI WOG, NIBCO 413, STICHHAW B-321, MILWAUKEE 507, OR ACCEPTED EQUAL.
- 2.02 FIXTURES AND EQUIPMENT(S)(O/M):
- GENERAL: PROVIDE AND INSTALL ALL FIXTURES AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED WITH ALL SUPPLIES, WASTE AND VENT CONNECTIONS, ALL FITTINGS, ALL NECESSARY SUPPORTS, FAUCETS, VALVES AND TRAPS. FURNISH INDIVIDUAL STOPS ON SUPPLY PIPES OF ALL FIXTURES EXCEPT FOR SUPPLY PIPES TO FLUSH VALVES WITH AN O/M.
  - ELECTRIC WATER HEATER: RHEEM MODEL ELDRU-TB OR ACCEPTED EQUAL BY OTHERS, ELECTRIC WATER HEATER, 6250 WATTS UPPER AND LOWER ELEMENT, NON-SIMULTANEOUS, THREE PHASE, 480V, 80 GALLON PORCELAIN COATED TANK, 49 GALLON RECOVERY AT 100° RISE. SHALL BE COMPLETE WITH INTEGRAL DRAIN PAN SHELF, 1/2" RELIEF VALVE, IN-LINE, EXPANSION TANK HAVING A TOTAL VOLUME OF 10.3 GALLONS FOR SYSTEM.

2.03 STERILIZING, FLUSHING AND TESTING:

- TESTING OF PIPING SYSTEMS SHALL BE IN ACCORDANCE WITH THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE AND THE INTERNATIONAL PLUMBING CODE SECTION 610.
- NEW PIPING SHALL BE STERILIZED, FLUSHED AND TESTED PRIOR TO CONNECTING TO EXISTING PIPING. REV. DATE:
- DOMESTIC WATER PIPING: STERILIZE WITH CHLORINE, 50 PARTS PER MILLION, FOR A 24-HOUR PERIOD, AFTER WHICH THE SYSTEM SHALL BE FLUSHED BEFORE BEING PUT INTO SERVICE.
- FLUSHING OF PIPING: FLUSH ALL PIPING TO REMOVE SEDIMENT, PIPE SCALE, ETC., FROM WATER LINES.

2.04 IDENTIFICATION:

- ALL PIPING AND EQUIPMENT SHALL BE IDENTIFIED WITH 1" HIGH STENCILED LETTERS. PIPING SHALL HAVE FLOW DIRECTION ARROWS.

2.05 PIPE INSULATION:

- ALL WATER PIPE SHALL BE INSULATED WITH FINE HEAVY DENSITY FIBROUS GLASS INSULATION WITH FOIL-SCRIM-WHITE KRAFT PAPER VAPOR BARRIER JACKET MOULDED TO CONFORM TO PIPING OR DRAIN, 0.25 BTU/IN SQ. FT./1/2" IN MAXIMUM "X" VALUE AT 75°. ALL INSULATING MATERIALS SHALL HAVE A COMPOSITE FLAME SPREAD RATING NOT EXCEEDING 25, AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50 AS TESTED UNDER PROCEDURE ASTM D-84-75, NFPA 255 AND UL 723. ALL INSULATION SHALL BE 1" THICK. INSULATION EXPOSED TO WEATHER SHALL HAVE MINIMUM 0.032 ALUMINUM JACKET WITH ALL JOINTS SEALED WATER TIGHT.

PART 3 - EXECUTION

3.01 PIPING WORK IN GENERAL:

- CUT PIPE ACCURATELY TO MEASUREMENT ESTABLISHED AT PROJECT. PROVIDE PLUGS AND CAPS AS INDICATED AND WHERE NECESSARY. PROVIDE PROPERLY FOR EXPANSION, CONTRACTION AND DRAINAGE IN ALL PIPING.

3.02 PIPE JOINTS AND CONNECTIONS:

- SCREW JOINTS: REAM PIPES AFTER CUTTING AND THREADING, FREE FROM FINES AND BURRS. JOINTS SHALL BE MADE WITH COMPOUND OR TEFLON TAPE APPLIED TO MALE THREADS ONLY, AND ALL EXPOSED THREADS ON PIPES MOPPED WITH COMPOUND OR COVERED WITH TAPE TO PREVENT RUST. FULL CUT THREADS, NOT MORE THAN 3 EXPOSED THREADS AFTER JOINT MADE UPTIGHT.
- COPPER PIPE JOINTS: ALL SWEAT COPPER FITTINGS FOR WATER, SANITARY, WASTE AND VENT PIPING SHALL BE MADE UP WITH LEAD FREE SOLDER. SOLDER SHALL BE 95.5 TIN-ANTIMONY OR 95-4.5-5 TIN-ANTIMONY-SILVER. ALL JOINTS FOR MECHANICALLY FORMED TEE FITTINGS SHALL BE BRAZED IN ACCORDANCE WITH THE COPPER DEVELOPMENT ASSOCIATION COPPER TUBE HANDBOOK USING BCUP SERIES FILLER MATERIAL. REFER HEREINAFTER TO SPECIAL PIPING SYSTEMS FOR SPECIFIC SOLDER REQUIREMENTS.
- UNIONS: IN SCREWED PIPE, 2" AND SMALLER, TO BE GROUND JOINT WITH BRASS SEAT; FLANGED UNIONS FOR PIPES LARGER THAN 2".

3.03 HANGERS AND SUPPORTS:

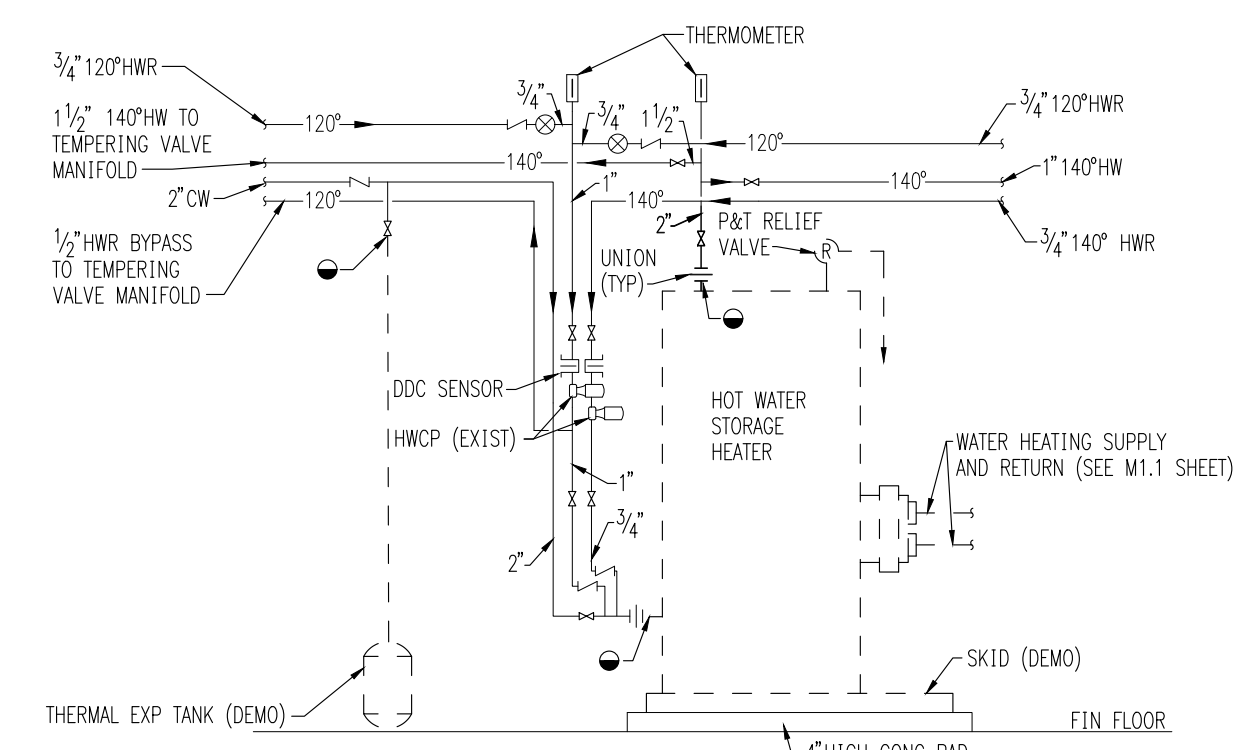
- HORIZONTAL PIPING: SUPPORT ALL PIPING WITHOUT STRAIN OR SAGGING. HANGERS SHALL BE PIPE RING, SPLIT PIPE RING, EXTENSION SPLIT PIPE CLAMP, OR CLEVIS TYPE, WITH MEANS FOR ADJUSTING LENGTH OF HANGER ROD. HANGERS SHALL BE SUPPORTED FROM BEAM CLAMPS, INSERTS OR APPROVED SOCKETS INSERTED IN SLAB CONSTRUCTION. PIPE HANGER RODS SHALL BE ATTACHED TO THE TOP CHORD ONLY ON STEEL JOISTS AND BEAMS BY JOIST OR BEAM CLAMPS, WITHOUT WELDING. WELDING OF SUPPORT RODS WILL NOT BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. WIRE, THIN STRAP, AND PERFORATED STRAP HANGERS WILL NOT BE ACCEPTABLE.
- VERTICAL PIPING: SUPPORT ALL RISERS AND STACKS AT EACH FLOOR WITH RISER CLAMPS. SUPPORT PIPING ON WALLS WITH RING OR SPLIT RING HANGERS WITH WALL FLANGE.
- COPPER PIPING: HANGERS AND SUPPORTS SHALL BE COPPER, BRASS, OR COPPER PLATED STEEL OR COPPER PLATED MALLEABLE IRON.
- INSULATED PIPING: PROVIDE FACTORY FABRICATED SADDLES OR SHIELDS UNDER ALL HANGERS AND SUPPORTS PROVIDED FOR INSULATED WATER PIPING. SIZE SADDLES AND SHIELDS FOR EXACT FIT TO MATE WITH PIPE INSULATION. ALL OTHER INSULATED PIPES SHALL BE SUPPORTED DIRECTLY BY THE HANGER; NO SADDLE OR SHIELD REQUIRED.
- HANGER SPACING FOR COPPER PIPES: SPACE NOT OVER 6 FT. APART FOR 1-1/4" OR SMALLER PIPE, AND NOT OVER 10 FT. APART FOR PIPES 1-1/2" OR LARGER. LOCATE HANGERS AT POINTS WHERE PIPES CHANGE DIRECTION. INTERMEDIATE SUPPORTS SHALL BE PROVIDED ON EXPOSED VERTICAL PIPING TO PREVENT SWAYING OF PIPING.

3.04 INSTALLATION:

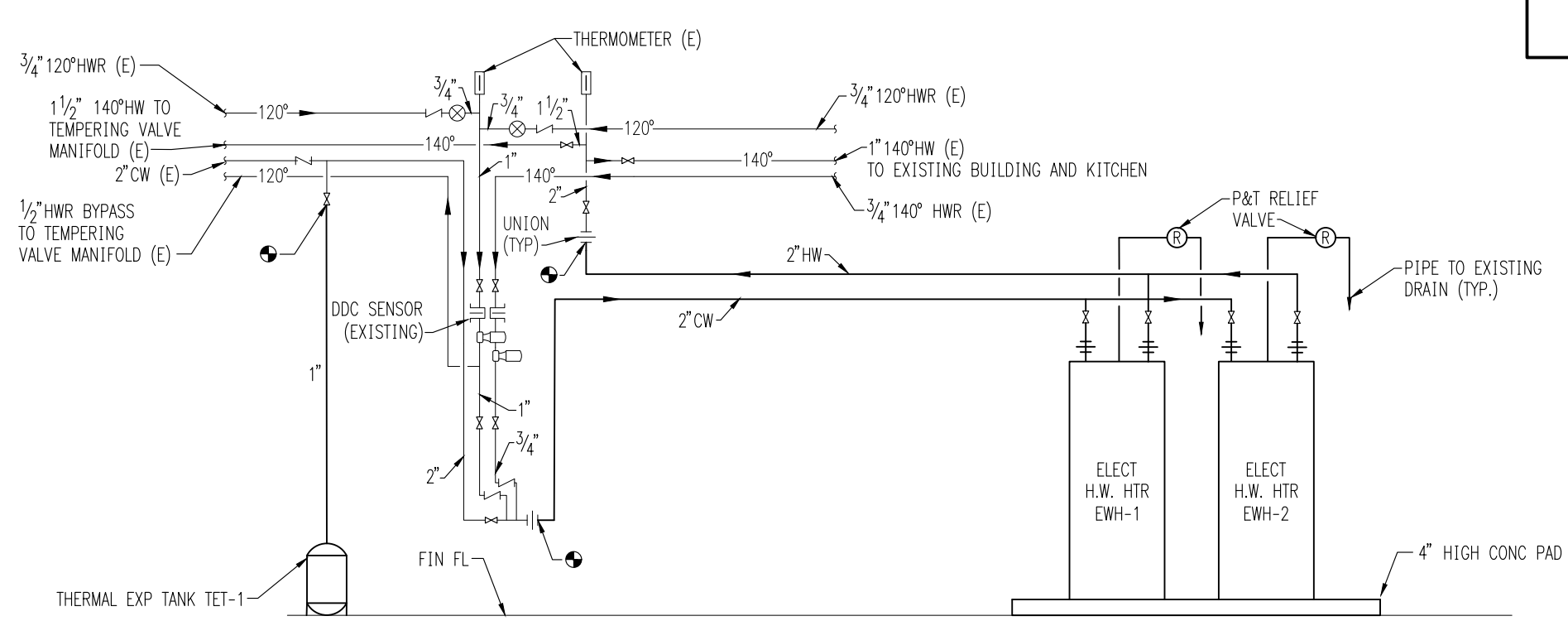
- GRADING OF DOMESTIC WATER PIPING: PIPING SHALL BE SO GRADED TO PERMIT DRAINAGE OF ALL PIPING AT COLD WATER SERVICE VALVES, AT FIXTURES OR OTHER DRAIN VALVES. DRAINAGE OF LOW POINTS SHALL BE ACCOMPLISHED BY EXTENDING 1/4" BRANCHES TO DRAIN VALVES WHERE INDICATED ON DRAWINGS OR WHERE REQUIRED ON THE JOB FOR COMPLETE DRAINAGE OF THE SYSTEMS.
- DIELECTRIC FITTINGS: AT ALL LOCATIONS WHERE DISSIMILAR METALS ARE JOINED, PROVIDE DIELECTRIC INSULATING CONNECTIONS ESPECIALLY BUILT TO PREVENT ELECTROLYSIS SUCH AS SPECIAL COUPLINGS, FITTINGS OR UNIONS.

WATER HEATER SCHEDULE								
MARK	KW	CAPACITY, GAL	TEMPERATURE OUT	HW CONNECTION	CW CONNECTION	VOLTAGE, V	PHASE	BASIS OF DESIGN
EW-1	12.1	80	140	3/4"	3/4"	480	3	RHEEM ELDRU-TB
EW-2	12.1	80	140	3/4"	3/4"	480	3	RHEEM ELDRU-TB

DOMESTIC WATER THERMAL EXPANSION TANKS							
MARK	MODEL	TANK TYPE	TANK VOLUME	MAX ACCEPTANCE	CONNECTION	STANDARD WORKING PRESSURE, PSIG	STANDARD OPERATING TEMP, F
TE-1	AMFROL SF-250	DIAPHRAGM	10.3 GAL	10.3 GAL	"	40	150



DETAIL OF DEMOLITION OF DOMESTIC HOT WATER SUPPLY SYSTEM  
NO SCALE



DETAIL OF DOMESTIC HOT WATER SUPPLY SYSTEM  
NO SCALE

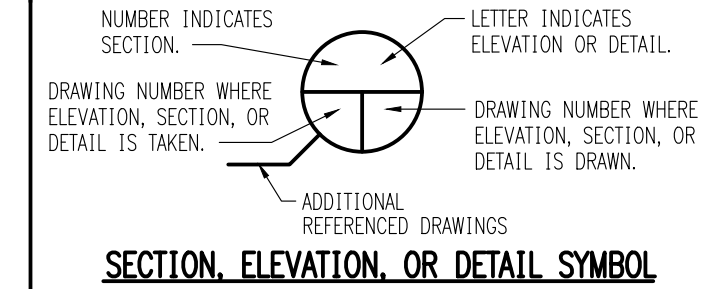
PLUMBING LEGEND  
SYMBOLS AND ABBREVIATIONS

TEE OR ELBOW FROM TOP OF MAIN	
TOP OF MAIN	
BRANCH FROM	
BOTTOM OF MAIN	
SIDE OF MAIN	
IN PLAN	
DIAGRAMMATIC	
COLD WATER	
HOT WATER	
HOT WATER RETURN	
DIRECTION OF FLOW	
CUTOFF VALVE (ON PLAN)	
CUTOFF VALVE (IN VERTICAL)	
GLOBE VALVE	
CHECK VALVE	
BALANCING COCK	
CONNECT TO EXISTING	
EXTENT OF DEMOLITION	
SHOCK ABSORBER	
STRAINER	
ABV - ABOVE	HB - HOSE BIBB
AD - ACCESS DOOR	HW - HOT WATER
BEL - BELOW	HWR - HOT WATER RETURN
BJ - CAST BRON	PRV - PRESSURE
CO - CLEAN-OUT	RV - REDUCING VALVE
CONC. - CONCRETE	PVC - POLYVINYL CHLORIDE
CV - CUTOFF VALVE	P&T - PRESSURE & TEMPERATURE
CW - COLD WATER	TEMPERATURE
DN - DOWN	RELIEF VALVE
E - EXISTING	SA - SHOCK ABSORBER
FD - FLOOR DRAIN	SAN - SANITARY
FL - FLOOR	

GENERAL PLUMBING NOTES

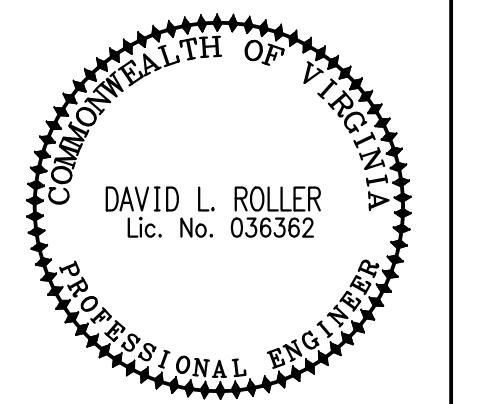
- MAKE PROPER H & CW, HWR, W, V, ETC. PIPING CONNECTIONS TO ALL FIXTURES AND EQUIPMENT. EVEN THOUGH ALL BRANCH MAINS, ELBOWS AND CONNECTIONS ARE NOT SHOWN.
- CHECK WITH MANUFACTURER'S WRITTEN INSTRUCTIONS PRIOR TO INSTALLATION OF ALL EQUIPMENT.
- COORDINATE WITH ALL EXISTING CONDITIONS.
- PIPE ALL DRAINS TO EXISTING FLOOR DRAINS.
- ALL CUTOFF VALVES, SHOCK ABSORBERS, ETC. SHALL BE ACCESSIBLE.
- CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING PIPING BEFORE NEW PIPING IS INSTALLED.
- ALL PLUMBING DEMOLITION SHALL BE COORDINATED WITH THE OWNER.

IDENTIFICATION KEY



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ROANOKE, VIRGINIA 24019  
(540) 285-4444  
SEPTEMBER 5, 2023  
COMMISSION NO. 23410

D. DWR C. RWD



OAK GROVE ES  
ROANOKE COUNTY SCHOOLS  
ROANOKE, VIRGINIA

REVISIONS  
CONSTRUCTION DOCUMENTS

ADDENDUM #1  
10/17/2023

SHEET TITLE  
PLUMBING  
DETAILS,  
NOTES,  
SCHEDULES  
AND  
SPECIFICATIONS

SHEET NUMBER  
**P0.1**

THESE DRAWINGS ARE BASED ON HISTORICAL DRAWINGS OF THE EXISTING BUILDING PROVIDED BY THE OWNER. CONTRACTOR SHALL VERIFY ALL CONDITIONS PRIOR TO FABRICATION OF SYSTEM. MODIFICATIONS SHALL BE MADE ONLY AFTER APPROVAL OF ENGINEER.