

PLUMBING SPECIFICATIONS

22 00 00 - GENERAL REQUIREMENTS

1. THE FOLLOWING APPLIES TO PLUMBING TRADES.
2. OBTAIN ALL PERMITS AND APPROVALS TO PERFORM THE WORK.
3. VERIFY ALL MEASUREMENTS AND EXISTING CONDITIONS IN THE FIELD. GENERAL SCHEMATIC LAYOUT IS INDICATED; ALL OFFSETS OBSTRUCTIONS, AND EXISTING CONFIGURATIONS AND CONSTRAINTS MUST BE FIELD VERIFIED.
4. INSTALL ALL NEW AND RELOCATED EXISTING COMPONENTS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS, APPLICABLE CODES AND STANDARDS.
5. COORDINATE ELECTRICAL POWER REQUIREMENTS FOR ALL MOTORS.
6. COORDINATE WITH OWNER FURNISHED EQUIPMENT AND SYSTEMS.
7. SEAL INTERIOR PIPE PENETRATIONS WITH FIRE SEALANT. SEAL EXTERIOR WALL PIPE PENETRATIONS WATER TIGHT.
8. CUT AND PATCH SURFACES. RESTORING ORIGINAL FINISHES.
9. EQUIPMENT LISTED IS THE BASIS OF DESIGN. OR ENGINEER APPROVED EQUAL.
10. SUBMITTALS, PRE-CONSTRUCTION: SUBMIT CATALOG CUT SHEETS OF PROPOSED EQUIPMENT FOR ENGINEER REVIEW AND APPROVAL PRIOR TO PURCHASE AND INSTALLATION.
11. SUBMITTALS, DURING CONSTRUCTION: SUBMIT COPIES OF PIPE ROUGH-IN PRESSURE TESTS AS COMPLETED.
12. SUBMITTALS, POST CONSTRUCTION: SUBMIT COPIES OF FINAL PRESSURE TEST, FLUSHING AND PLUMBING DISINFECTION REPORTS. SUBMIT COPIES OF COMPLETED MANUFACTURER START UP REPORTS FOR EQUIPMENT.
13. OPERATIONS AND MAINTENANCE MANUALS: SUBMIT ALL TESTING DATA AND COPIES OF APPROVED PRODUCT DATA, INCLUDING MAINTENANCE INFORMATION IN A TABBED, NEATLY ORGANIZED THREE RING BINDER. INCLUDE VALVE IDENTIFICATION CHARTS PROVIDE 3 COPIES TO THE OWNER.
14. PIPE IDENTIFICATION: LABELING SHALL APPEAR AT INTERVALS OF NOT MORE THAN 20 FEET AND AT LEAST ONCE IN EACH ROOM AND EACH STORY TRAVERSED BY THE PIPING SYSTEM. ALL PIPING SHALL BE CLEARLY IDENTIFIED SPECIFICALLY FOR TYPE OF SERVICE WITH COILED PLASTIC PIPE MARKERS AND FLOW DIRECTION ARROWS.
15. VALVE IDENTIFICATION: PROVIDE A CIRCULAR BRASS TAG AND CHAIN ON EACH VALVE. TAG TO INCLUDE A DISCRETE NUMBER AND SHALL BE COORDINATED WITH ANY CURRENT FACILITY NUMBERING SCHEME OR STANDARD.
16. RECORD DRAWINGS: MAINTAIN A CURRENT SET OF MARKED UP CONSTRUCTION DRAWINGS ON SITE AT ALL TIMES. PROVIDE A COMPLETE SET OF THESE RECORD MARK-UPS TO THE ARCHITECT AT THE END OF THE PROJECT.
17. ASTM E84 COMPLIANCE: INSULATION AND OTHER MATERIALS SHALL COMPLY WITH THE FLAME AND SMOKE SPREAD RATINGS.

22 05 00 - PLUMBING PIPING

1. PROVIDE ALL PIPING COMPLETE WITH FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDES, SLEEVES, AND ACCESSORIES.
2. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE.
3. DRAINAGE AND VENT PIPING SHALL BE TESTED. CAP ALL OUTLETS AND FILL PIPING SYSTEM TO OVERFLOWING FROM A POINT AT LEAST 10 FT ABOVE THE FLOOR. WATER LEVEL SHALL REMAIN CONSTANT THROUGHOUT A 2 HOUR TEST DURATION.
4. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
5. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
6. PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
7. ALL EXPOSED PIPING PASSING THROUGH WALLS, FLOORS, CEILINGS, AND PARTITIONS SHALL BE PROVIDED WITH CHROME PLATED CAST BRASS ESCUTCHEONS HELD IN PLACE WITH SET SCREWS.
8. ABOVE GRADE SANITARY DRAINAGE AND VENT PIPING: HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH ANCON FOUNDRY HUSKY SERIES 4000 EXTRA WIDE HEAVY DUTY GASKETED HUBLESS COUPLINGS.
9. DOMESTIC CW AND HW PIPING SHALL BE COPPER, TYPE L, HARD DRAWN IN ACCORDANCE WITH ASTM B88, AND LEAD-FREE SOLDER JOINTS.
10. INSPECTIONS AND TESTS SHALL BE PERFORMED ON THE PIPING INSTALLATION AS REQUIRED BY CODE.
11. PITCH SANITARY DRAINAGE PIPING AT 1/4" PER FT. PITCH DOMESTIC CW, HW, AND VENT PIPING TOWARDS SOURCE.

22 07 19 - PIPING INSULATION

1. GENERAL REQUIREMENTS
 - A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS. STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAME SPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.
 - B. DEFINITIONS:
 - B.A. EXPOSED: PIPING LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.
 - B.B. CONCEALED: INDOOR PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.
2. PIPING INSULATION
 - A. INSULATE ALL PIPING IN ACCORDANCE WITH THE FOLLOWING...
 - A.1. SERVICE: LOW TEMP PIPING - 40°F TO 100°F
 - A.1.a. SIZE: UP TO 4"
 - A.1.b. THICKNESS: 1"
 - A.1.c. MATERIAL: P-1
 - A.1.d. FINISH: VAPORSEAL
 - A.2. SERVICE: LOW TEMP FITTINGS AND VALVES
 - A.2.a. SIZE: UP TO 4"
 - A.2.b. THICKNESS: 1"
 - A.2.c. MATERIAL: P-4
 - A.2.d. FINISH: VAPOR SEAL
 - B. PIPING, VALVE AND FITTINGS TO BE INSULATED:
 - B.1. LOW TEMPERATURE PIPING SYSTEMS - 40 TO 100 °F INCLUDING:
 - B.1.a. COLD WATER, NPW AND FW
 - C. MATERIAL:
 - C.1. ALL INSULATION (INCLUDING JACKET, FACING, AND ADHESIVE) SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURES LISTED IN ASTM E-84, NFPA 255, AND UL 273; NOT EXCEEDING A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED OF 50.
 - C.2. TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING, ALL SERVICE JACKET. SIMILAR TO OWNENS CORNING 850 ASI.
 - C.3. TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI LO TEMP INSULATION INSERTS.
3. FINISH
 - A. TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
4. INSTALLATION:
 - A. BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
 - B. ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED.
 - C. ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.
 - D. INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

22 11 16 - DOMESTIC AND NON-POTABLE WATER PIPING SYSTEMS

1. APPLICABLE SYSTEMS:
 - A. DOMESTIC COLD (CW)
2. PROVIDE COMPONENTS AND INSTALLATIONS CAPABLE OF PRODUCING PIPING SYSTEMS WITH THE FOLLOWING MINIMUM WORKING PRESSURE RATINGS, UNLESS OTHERWISE NOTED.
 - A. ABOVE GROUND WATER PIPING SYSTEMS: 125 PSIG
 - B. BELOW GROUND WATER PIPING SYSTEMS: 150 PSIG
3. ABOVE GRADE DOMESTIC : HARD DRAWN TYPE L SEAMLESS COPPER TUBING, COPPER FITTINGS AND LEAD-FREE SOLDERED JOINTS.
4. WATER PIPING SYSTEM VALVES: BRONZE BODIED VALVES, AS MANF BY HAMMOND, JENKINS, NIBCO.
 - A. SHUT-OFF DUTY: FULL PORT BALL VALVES
 - B. DIRECTIONAL DUTY: SWING STYLE CHECK VALVES.
 - C. HIGH-POINT VENTS AND LOW POINT DRAINS: FULL PORT BALL VALVES WITH CAP AND CHAIN.
 - D. THROTTLING DUTY: FIELD ADJUSTABLE CIRCUIT SETTERS.
5. WATER PIPING SYSTEM INSULATION: PROVIDE FIBERGLASS INSULATION ON ABOVE GRADE WATER PIPING SYSTEMS
 - A. PIPING UP TO 1-1/4-INCH: 1/2-INCH THICK
 - B. PIPING LARGER THAN 1-1/4-INCH: 1-INCH THICK.
6. WATER PIPING SYSTEM FLUSHING AND CLEANING: FLUSH PIPING SYSTEMS WITH WATER. DISINFECT WITH A WATER - CHLORINE SOLUTION (50 PPM CHLORINE) FOR 24 HOURS, OR AS DIRECTED BY PLUMBING OFFICIALS. FLUSH SYSTEMS AND PROVIDE WATER QUALITY REPORTING.
7. PROVIDE CODE COMPLIANT BACKFLOW PREVENTION @ ALL SINKS.

22 13 18 - SANITARY & STORM DRAINAGE, WASTE AND VENT (DWV) PIPING SYSTEMS

1. APPLICABLE SYSTEMS:
 - A. SANITARY WASTE AND VENT
2. PROVIDE COMPONENTS AND INSTALLATIONS CAPABLE OF PRODUCING PIPING SYSTEMS WITH THE FOLLOWING MINIMUM WORKING PRESSURE RATINGS, UNLESS OTHERWISE NOTED.
 - A. GRAVITY FLOW DWV PIPING SYSTEMS: 10 FT. HEAD.
3. ABOVE & BELOW GRADE GRAVITY FLOW WASTE AND VENT PIPING SYSTEMS:
 - A. SCHEDULE 40 CAST IRON PIPE, DWV STYLE FITTINGS AND NO-HUB JOINTS, 4 BAND SYSTEM MINIMUM ON COUPLING (ASTM C1277). GASKET PER ASTM C564
 - B. ABOVE GRADE ONLY: TYPE L COPPER FOR VENT TO MATCH EXISTING
 - C. PLUMBING FIXTURE P-TRAPS & TAIL PIPES: CHROME PLATED, CAST BRASS.

22 11 19 - PLUMBING SPECIALTIES


1. CLEANOUTS SHALL BE COMMERCIAL GRADE BRASS. APPROVED MANUFACTURERS INCLUDE ZURN, WADE, J.R. SMITH, JOSAM, OR APPROVED EQUAL.
2. PROVIDE ACCESS AND ACCESS PANELS TO PROVIDE ACCESSIBLE EQUIPMENT AND SPECIALTIES. WHERE NECESSARY, PROVIDE METAL UNITS WITH LOCKS, CONFIGURATION AND TRIM AS REQUIRED BY FINISH WALL SURFACE. APPROVED MANUFACTURERS INCLUDE KARP, MLCOR, NYSTROM, OR APPROVED EQUAL.
3. WALL HYDRANT: SHALL BE MANUFACTURED BY ZURN OR APPROVED EQUAL.
 - 3.A. PROVIDED WITH NON-FREEZE TYPE INTEGRAL BACKFLOW PREVENTER, BRONZE CASING, ALL BRONZE INTERIOR PARTS, NON-TURING OPERATING ROD WITH FREE-FLOATING COMPRESSIONS CLOSURE VALVE, REPLACEABLE BRONZE SEAT AND SEAT WASHER, AND COMBINATION 3/4" FEMALE OR 1" MALE STRAIGHT IP INLET.
4. HEAT TRACE: SHALL BE RAYCHEM 5XL-1 SELF REGULATING HEAT TRACE OR APPROVED EQUAL.
 - 4.A. BUS WIRES: 16AWG NICKEL-PLATED COPPER
 - 4.B. BRAID/OUTER JACKET: TINNED-COPPER BRAID WITH MODIFIED POLYOLEFIN JACKET OR FLUOROPOLYMER JACKET.
 - 4.C. CONNECTION KITS: RAYCHEM RAYCLIC OR FTC CONNECTION KITS MUST BE USED WITH XL-TRACE HEATING CABLES. REFER TO THE PIPE FREEZE PROTECTION AND FLOW MAINTENANCE DESIGN GUIDE FOR PROPER CONNECTION KIT SELECTION.
 - 4.D. GROUND - FAULT PROTECTION: TO MINIMIZE THE DANGER OF FIRE FROM SUSTAINED ELECTRICAL ARCING IF THE HEATING CABLE IS DAMAGED OR IMPROPERLY INSTALLED, AND TO COMPLY WITH THE REQUIREMENTS OF THERMAL MANAGEMENT, AGENCY CERTIFICATION AND NATIONAL ELECTRICAL CODE, GROUND-FAULT EQUIPMENT PROTECTION MUST BE USED ON EACH HEATING CABLE BRANCH CIRCUIT.

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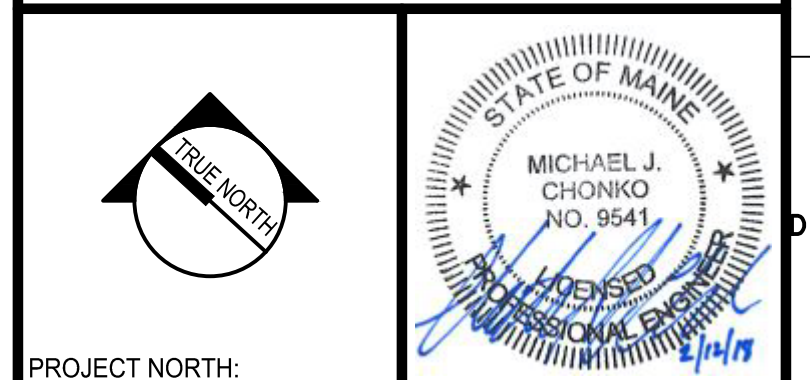
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BANGOR SAVINGS BANK - RENOVATIONS TO 280 FORE STREET PORTLAND, MAINE

PROJECT NO: **17231**
CAD DWG FILE: **PL002-17231**
DRAWN BY: **ASM**
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PLUMBING SPECIFICATIONS

PL002