



**PROJECT**

**MMC Cath Lab 4**  
22 Bramhall Street  
Portland, ME 04102



**Maine Medical Center**  
22 Bramhall Street  
Portland, ME 04102

**KEYPLAN**



**ISSUE FOR BID**  
01/15/2016

**ISSUE CHART**

NO	ISSUE	DATE
Job Number	B150268-000	
Checked		
Approved		

**TITLE**  
**PLUMBING**  
**SPECIFICATIONS**  
**SHEET**

SHEET NUMBER

**P-300**

**PLUMBING:**

**1. GENERAL:**

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIAL WHICH VIOLATES ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- C. INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AND TENANT AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- D. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. PIPE ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF PIPE TO AVOID OBSTRUCTIONS. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED. MAINTAIN HEADROOM AND SPACE CONDITIONS.
- E. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- F. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY REPRODUCED AND THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.
- G. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION.
- H. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
- I. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- J. THE LOCATIONS OF THE EXISTING SERVICES ARE BELIEVED TO BE AS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION OF THESE SERVICES AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING ANY WORK.
- K. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH A U-LISTED FIRESTOPPING ASSEMBLY MATCHED TO THE RATING OF THE PENETRATED ELEMENT.
- L. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPING AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED.
- M. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR, OR AS DIRECTED BY THE OWNER.
- N. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- O. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- P. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- Q. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- R. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
  - 1) ALL MATERIAL AND EQUIPMENT ON SITE SHALL BE PROPERLY STORED SUCH THAT IT IS PROTECTED FROM DAMAGE AND EXPOSURE TO THE OUTSIDE ELEMENTS.
- S. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INDICATE ANY DISCREPANCIES BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING PIPE SIZES, CLEARANCES, ETC., AND CONDITIONS.
- T. INSURANCE: PROVIDE IN ACCORDANCE WITH BUILDING REQUIREMENTS AND POLICY SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- U. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

**2. SCOPE OF WORK:**

- A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE STATE OF MAINE BUILDING CODE, STATE OF MAINE PLUMBING CODE & ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.
  - B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.
  - D. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OF ACTUAL USE OF EQUIPMENT OR BENEFICIAL OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.
  - E. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY AND REQUIRED SIGN-OFFS AND APPROVALS FOR THE WORK INSTALLED.
- 3. SHOP DRAWINGS:**
- A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT PROVIDE COMPLETE SET OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITING APPROVAL BY THE ARCHITECT AND ENGINEER.
  - B. INDICATE ON EACH SHOP DRAWING SUBMITTED:
    - 1) PROJECT NAME AND LOCATION.
    - 2) NAME OF ARCHITECT AND ENGINEER.
    - 3) ITEM IDENTIFICATION.
    - 4) APPROVAL STAMP OF PRIME CONTRACTOR.
  - C. SUBMISSIONS:
    - 1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
    - 2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.
  - D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
    - 1) PIPE AND FITTINGS.
    - 2) VALVES.
    - 3) PLUMBING FIXTURES AND TRIM.
    - 4) PIPING LAYOUTS.
    - 5) SUPPORTS, HANGERS AND GUIDES.
    - 6) INSULATION.
    - 7) GAS ZONE VALVE BOX ASSEMBLY.
- 4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS:**
- A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
  - B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
  - C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.
  - D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.
- 5. GENERAL PROVISIONS FOR PLUMBING WORK:**
- A. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
  - B. DEFINITIONS:
    - 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
    - 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
    - 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
    - 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
    - 5) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
    - 6) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
    - 7) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN, PERFORMANCE AND EFFICIENCY OF SPECIFIED PRODUCT.

**C. QUALITY ASSURANCE:**

- 1) QUALITY AND GAUGE OF MATERIALS: NEW, BEST OF THEIR RESPECTIVE KINDS, AND FREE FROM DEFECTS. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
  - 2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK.
- D. PRODUCT DELIVERY, STORAGE AND HANDLING:**
- 1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
  - 2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW.
- E. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK THAT IS SOILED OR DAMAGED, CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.**
- F. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL PLUMBING FIXTURES SHALL BE VERIFIED BY ARCHITECT.**
- G. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.**
- 6. PIPE, VALVES AND FITTINGS:**
- A. WATER PIPING, INTERIOR
    - 1) APPLIES TO:
      - a. DOMESTIC COLD WATER, HOT SUPPLY AND HOT RETURN,
      - b. NON-POTABLE WATER SYSTEMS,
    - 2) TUBE: SEAMLESS COPPER WATER TUBE, DRAWN TEMPER, TYPE L, ASTM B-88.
    - 3) FITTINGS:
      - a. 3" AND SMALLER: WROUGHT COPPER, SOLDER-JOINT. ASME B16.22
    - 4) JOINTS:
      - a. 3" AND SMALLER: ASTM B-32 SOLDER FILLER MATERIAL, ALLOY SB5 "95/5," ASTM B-813 LIQUID OR PASTE FLUX. SOLDERING PROCEDURES SHALL COMPLY WITH ASTM B-828.
    - 5) UNIONS: CAST COPPER ALLOY UNIONS, HEXAGONAL STOCK WITH BALL-AND-SOCKET JOINT, SOLDER JOINT ENDS. ASME B16.18.
    - 6) BALL VALVES:
      - a. 3" AND SMALLER: ALL BRONZE, 3 PIECE, FULL PORT, PTFE SEATS, SOLDER END CONNECTIONS. 600 PSIG WOG. APOLLO 82-200, MILWAUKEE BA-350, WATTS B-6801.
    - 7) CHECK VALVES:
      - a. 3" AND SMALLER: BRONZE BODY AND CLAPPER, SOLDER ENDS, 200 WOG. JENKINS 4093, MILWAUKEE 1509, STOCKHAM B-309.
    - 8) DRAIN VALVES: ALL BRONZE, 2 PIECE, RPTFE SEATS, THREAD X SOLDER END CONNECTIONS. 600 PSIG WOG. APOLLO 70-100, MILWAUKEE BA-150, WATTS B-6001. ASME B120.7 HOSE THREAD ADAPTER WITH CAP AND CHAIN.
    - 9) DISINFECTANT CHEMICALS:
      - a. HYPOCHLORITE FED. SPEC. 0-C-114, OR FED. SPEC. 0-S-602, GRADE B.
  - B. CLEAN COPPER TUBE
    - 1) APPLIES TO:
      - a. OXYGEN,
      - b. MEDICAL VACUUM,
      - c. MEDICAL AIR.
    - 2) TUBE: SEAMLESS COPPER TUBE, MEDICAL OXYGEN GRADE, DRAWN TEMPER, TYPE L, ASTM B-819. INCLUDE STANDARD COLOR MARKING "OXY," "MED," OR "OXY/MED."
    - 3) FITTINGS: WROUGHT COPPER, SOLDER-JOINT. ASME B16.22.
    - 4) JOINTS: ANS/AWS A5.8 BRAZING FILLER MATERIAL, BCUP SERIES. NO FLUX.
    - 5) MECHANICAL JOINTS:
      - a. 2" AND SMALLER: CAST COPPER ALLOY UNIONS, HEXAGONAL STOCK WITH BALL-AND-SOCKET JOINT, SOLDER JOINT ENDS. ASME B16.18.
    - 6) BALL VALVES:
      - a. 2" AND SMALLER: ALL BRONZE, 3 PIECE, FULL PORT, PTFE SEATS, CHROME PLATED BRONZE BALL, SOLDER END CONNECTIONS. 600 PSIG WOG. APOLLO 82-200-57, WATTS B-6801.
    - 7) SOURCE QUALITY ASSURANCE: VALVES SHALL BE BY A SINGLE MANUFACTURER. VALVES, FITTINGS, COMPONENTS AND EACH LENGTH OF TUBE SHALL BE FACTORY CLEANED PER THE APPLICABLE PIPE STANDARD. THEY SHALL BE PERMANENTLY LABELED AND DELIVERED PLUGGED, CAPPED, BAGGED OR OTHERWISE SEALED. PLUS CAPS OR OTHER SEALS SHALL REMAIN IN PLACE UNTIL FINAL ASSEMBLY.
    - 8) JOINTS AND PIPING SHALL BE CONTINUOUSLY PURGED WITH A POSITIVE FLOW OF GRADE M, CSA PAMPHLET G-10.1 OIL-FREE, DRY NITROGEN PER ANS/AWS B2.2 PROCEDURES.
- 7. SANITARY WASTE & VENT PIPING (2-1/2" & LARGER)**
- 1) HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH ANCON FOUNDRY HUSKIE SERIES 4000 EXTRA WIDE HEAVY DUTY GASKETED HUBLESS COUPLINGS.
  - 2) HUB AND SPIGOT CAST IRON PIPE AND FITTINGS WITH NEOPRENE GASKETED JOINTS.
  - 3) TYPE L, SEAMLESS COPPER WATER TUBE, DRAWN TEMPER, ASTM B-88.
  - 4) FITTINGS: WROUGHT COPPER, SOLDER-JOINT. ASME B16.22 (PIPING 2" & SMALLER)
  - 5) JOINTS: ASTM B-32 SOLDER FILLER MATERIAL, ALLOY SB5, "95/5," ASTM B-813 LIQUID OR PASTE FLUX. SOLDERING PROCEDURES SHALL COMPLY WITH B-828 (PIPING 2" & SMALLER)

**9. INSULATION:**

- A. 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 277; NOT EXCEEDING A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED OF 50.
  - B. PROVIDE PVC SHEATHED PREMOULDED FIBERGLASS INSULATION FITTINGS ON ALL VALVES AND PIPE FITTINGS.
    - 1) PROVIDE VAPOR BARRIER ON ALL COLD WATER VALVES AND FITTINGS.
  - C. PIPE INSULATION SHALL BE SECTIONAL COVERED FIBERGLASS SECURED IN PLACE WITH ADHESIVE TAPE BANDS 1 INCH WIDE.
    - 1) INSULATION SHALL NOT BE SECURED WITH STAPLES.
  - D. PROVIDE 1/2 INCH THICK INSULATION WITH VAPOR BARRIER ON ALL COLD WATER PIPING.
  - E. PROVIDE 1 INCH THICK INSULATION ON ALL HOT WATER PIPING.
- 10. PIPING SUPPORTS:**
- A. SUPPORT ALL PIPING FROM BUILDING CONSTRUCTION BY PROVIDING INSERTS, BEAM CLAMPS, STEEL FISHPLATES (ON CONCRETE FILL ONLY), AND ACCEPTABLE BRACKETS. SUBMIT ALL METHODS FOR REVIEW.
  - B. PROVIDE TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS FOR GROUPED LINES AND SERVICES.
  - C. PROVIDE ADDITIONAL FRAMING WHERE BUILDING CONSTRUCTION IS INADEQUATE. SUBMIT FOR REVIEW.
  - D. SUSPENDED HORIZONTAL PIPING:
    - 1) SUPPORT ALL PIPING INDEPENDENTLY FROM STRUCTURE USING HEAVY ALUMINUM-HINGED TYPE HANGERS, SIMILAR TO "GRINNELL" CLEVIS.
    - 2) PROVIDE ELECTROPLATED SOLID-BAND HANGERS SIMILAR TO AUTO-GRIP, FOR TWO-INCH AND SMALLER PIPE.
    - 3) PROVIDE WALL BRACKETS FOR WALL-SUPPORTED PIPING, AND PROVIDE PIPE SADDLES FOR FLOOR-MOUNTED PIPING.
    - 4) PROVIDE SUPPORTS WITH COPPER LINING FOR UNINSULATED COPPER PIPING.
    - 5) SUSPEND PIPING FROM INSERTS, USING BEAM CLAMPS WITH RETAINING CLAMP OR LOCKWELL, ALUMINUM PLATES, CANTILEVER BRACKETS OR OTHER ACCEPTED MEANS. BEAM CLAMPS SHALL BE SIMILAR TO GRINNELL FIGURES 61, 67, 131, OR 225.
    - 6) SUSPEND PIPING BY STAINLESS STEEL RODS WITH DOUBLE NUTS.
    - 7) PROVIDE ADDITIONAL STEEL FRAMING AS REQUIRED AND ACCEPTED WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING HANGER RODS IN REQUIRED LOCATIONS.
    - 8) SUPPORT BRANCH FIXTURE WATER PIPING IN CHASES WITH COPPER-PLATED METAL BRACKETS, SECURED TO STUDS, SIMILAR TO HOLDRITE NOS. 102-18, 107-18, 102-26, OR 101-26.
  - E. PROVIDE 180 DEGREE ARC GALVANIZED METAL COVERING SHIELDS ON HANGERS FOR INSULATED PIPING WITHOUT INCOMPRESSIBLE INSULATING BLOCK IN INSULATION AT HANGERS.
  - F. MAXIMUM HANGER SPACING AS INDICATED.
    - 2) PIPE 1 INCH AND SMALLER SHALL BE EVERY 8 FEET.
    - 3) PIPE 1-1/4 INCH AND LARGER SHALL BE EVERY 10 FEET.
    - 4) COPPER TUBING 1-1/4 INCH AND SMALLER SHALL BE EVERY 6 FEET.
    - 5) COPPER TUBING 1-1/2 INCH AND LARGER SHALL BE EVERY 10 FEET.
  - G. VERTICAL PIPING:
    - 1) PROVIDE EXTENSION PIPE CLAMPS BOLTED TO BARE PIPE ON EACH SIDE AND BEARING EQUALLY ON STRUCTURE OR WELDED TO BEAM.
    - 2) PROVIDE SPACING AS INDICATED:
      - a. THREADED PIPING SHALL BE EVERY OTHER FLOOR LEVEL, AT A MAXIMUM OF 25 FEET ON CENTERS.
      - b. CAST IRON PIPING SHALL BE EVERY FLOOR LEVEL, MAXIMUM 20 FEET ON CENTERS; HUBLESS PIPE IS THE EXCEPTION, REQUIRING A MAXIMUM OF 10 FEET ON CENTERS.
      - c. TUBING SHALL BE EVERY FLOOR LEVEL MAXIMUM 10 FEET ON CENTERS.
- 11. TESTS:**
- A. ALL PLUMBING SYSTEMS SHALL BE TESTED FOR CONTINUITY AND PROPER OPERATION.
  - B. DOMESTIC & NON-DOMESTIC WATER PIPING:
    - 1) TEST PIPING HYDROSTATICALLY AT A PRESSURE OF 125 PSI.
    - 2) DURATION OF TEST SHALL BE 2 HOURS WITHOUT A LOSS IN PRESSURE.
  - C. DRAINAGE AND VENT PIPING:
    - 1) CAP ALL OUTLETS AND FILL PIPING SYSTEM TO OVERFLOWING FROM A POINT AT LEAST 10 FEET ABOVE THE FLOOR.
    - 2) THE WATER LEVEL SHALL REMAIN CONSTANT THROUGHOUT THE TEST DURATION OF 2 HOURS.
  - D. MEDICAL GAS PIPING:
    - 1) THE PIPING SHALL BE TESTED WITH HIGH PURITY NITROGEN AT 1.5 TIMES THE WORKING PRESSURE OF THE SYSTEM FOR A DURATION OF 4 HOURS.
  - E. ALL MEDICAL GAS PIPING SHALL BE CERTIFIED, PER NFPA-99 REQUIREMENTS.
  - F. ARRANGE AND COORDINATE TESTS WITH OWNER 48 HOURS IN ADVANCE. NOTIFY ENGINEER AND ARCHITECT OF TEST DATE AND TIME.
  - G. DEFECTS DISCLOSED BY THE TESTS SHALL BE REPAIRED OR REPLACED. TESTS SHALL BE REPEATED AS DIRECTED UNTIL ALL WORK IS PROVEN SATISFACTORY.
  - H. TAKE ALL PRECAUTIONS NECESSARY TO PREVENT DAMAGE TO THE BUILDING AND ITS CONTENTS AS A RESULT OF SUCH TESTS. REPAIR ANY DAMAGE CAUSED.

SAVE DATE: 1/15/2016 4:12 PM

LOGIN: Coussineau, Christopher

PLOT DATE: 1/27/2016 3:38 PM

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