



PLUMBING SPECIFICATIONS

PART 1: GENERAL:

- A. THE CONTRACTOR SHALL FURNISH, INSTALL, PROVIDE AND MAKE OPERATIVE ALL EQUIPMENT, MATERIALS, SUPERVISION LABOR AND ANY AND ALL ITEMS NECESSARY FOR THE PROPER INSTALLATION OF A CORRECTLY FUNCTIONING PLUMBING SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.
- B. SMALL DETAILS NOT USUALLY INDICATED ON THE DRAWINGS OR SPECIFIED, BUT WHICH ARE NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE PLUMBING SYSTEM, SHALL BE INCLUDED IN THE WORK AND IN THE CONTRACTOR'S ESTIMATE THE SAME AS IF SPECIFIED OR SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL INSTALL THE EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE THE DRAWINGS AND SPECIFICATIONS CONFLICT WITH THE MANUFACTURER'S RECOMMENDATIONS, IT WILL BE THE CONTRACTOR'S DUTY TO BRING THIS TO THE ATTENTION OF THE ARCHITECT.

PART 2: CODE REQUIREMENTS:

- A. ORDINANCES, PERMITS AND CODES: THE WORKMANSHIP AND MATERIALS COVERED BY THESE SPECIFICATIONS SHALL CONFORM TO ALL REGULATIONS OF ALL THE AUTHORITIES HAVING JURISDICTION WHETHER SHOWN ON THE DRAWINGS OR NOT.

PART 3: PERMITS:

- A. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, CONNECTION AND INSPECTION FEES AS REQUIRED FOR THE COMPLETE INSTALLATION OF THE PLUMBING SYSTEMS.

PART 4: SPECIFICATIONS AND DRAWINGS:

- A. THE PLANS DEPICT THE LOCATION OF ALL FIXTURES AND EQUIPMENT AND ARE INTENDED TO INDICATE THE GENERAL INTENT OF THE WORK IN SCOPE, LAYOUT AND QUALITY OF WORKMANSHIP. THEY ARE NOT INTENDED TO SHOW IN MINUTE DETAIL EVERY AND ALL ACCESSORIES INTENDED FOR THE PURPOSE OF EXECUTION OF THE WORK, BUT THE CONTRACTOR SHALL UNDERSTAND THAT SUCH DETAILS ARE PART OF THIS WORK.
- B. THE LOCATION OF PIPES AND EQUIPMENT AS SHOWN ON THE DRAWINGS, IS DIAGRAMMATIC AND SCHEMATIC AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE HIS OWN WORKING LAYOUT TO ELIMINATE ALL STRUCTURAL INTERFERENCES WITHOUT DETRIMENT TO THE STRUCTURAL AND ARCHITECTURAL COMPONENTS OF THE BUILDING.
- C. THE CONTRACTOR SHALL CAREFULLY VERIFY ALL MEASUREMENTS OF THE SITE, DETERMINE THE EXACT LOCATION OF ALL CHASES AND OPENINGS REQUIRED BY HIS WORK AND SHALL FURNISH AND SET ALL SLEEVES, INSERTS AND HANGERS AS REQUIRED FOR THE WORK HEREIN.
- D. ALL CONTRACTORS SUBMITTING PROPOSALS FOR THIS WORK SHALL FIRST EXAMINE THE SITE AND ALL CONDITIONS. ALL PROPOSALS SHALL TAKE INTO CONSIDERATION ALL SUCH CONDITIONS AS MAY THE WORK UNDER THIS CONTRACT.
- E. SUBMITTALS: PROVIDE PRODUCT DATA AND SIZES, ROUGH-IN DIMENSIONS TO ENGINEER FOR APPROVAL.

PART 5: COORDINATION AND CONFLICTS:

- A. THE CONTRACTOR SHALL COORDINATE HIS WORK SO THAT IT DOES NOT INTERFERE WITH THE WORK OF THE OTHER TRADES. IT SHALL BE THE CONTRACTOR'S DUTY TO SEE THAT THE WORK IS PERFORMED IN A TIMELY MANNER.
- B. IN THE EVENT THAT THERE IS A DISCREPANCY OR CONFLICT IN THE PLANS OR SPECIFICATIONS IT SHALL BE THE CONTRACTOR'S DUTY TO NOTIFY THE ARCHITECT OF THIS CONFLICT OR DISCREPANCY PRIOR TO HIS ACCEPTANCE OF THE PROJECT. UNLESS EXPRESSLY STIPULATED, NO ADDITIONAL ALLOWANCES WILL BE MADE IN THE CONTRACTOR'S AND/OR MANUFACTURER'S FAVOR BY VIRTUE OF ERRORS, AMBIGUITIES AND/OR OMISSIONS WHICH WERE KNOWN TO OR WHICH SHOULD HAVE BEEN KNOWN OR DISCOVERED DURING THE PREPARATION OF THE BID ESTIMATE AND DIRECTED TO THE ARCHITECT'S ATTENTION IN A TIMELY MANNER.

PART 6: EXPERIENCE:

- A. THE CONTRACTOR SHALL BE A REPUTABLE FIRM REGULARLY DOING THIS TYPE OF WORK, WITH SKILLED MECHANICS AND EQUIPMENT CAPABLE OF PROVIDING A FIRST CLASS INSTALLATION IN ACCORDANCE WITH ACCEPTABLE MODERN PRACTICES.

PART 7: PLUMBING THERMOMETERS:

- A. STEM TYPE THERMOMETERS: ADJUSTABLE ANGLE, RED OR BLUE APPEARING NON-TOXIC LIQUID IN GLASS, CAST ALUMINUM CASE WITH ENAMEL FINISH, CAST ALUMINUM ADJUSTABLE JOINT WITH POSITIVE LOCKING DEVICE; ADJUSTABLE 360 DEGREES IN HORIZONTAL PLANE, 180 DEGREES IN VERTICAL PLANE. SIZE 9 INCH, SCALE 30 TO 240 DEG. F.
- B. ACCEPTABLE MANUFACTURERS ARE WEKSLER GLASS, H.O. TERRECE OR APPROVED EQUAL.

PART 8: PLUMBING IDENTIFICATION:

- A. NAMEPLATES FOR EQUIPMENT: LAMINATED THREE LAYER PLASTIC WITH ENGRAVED LETTERS, 1/4" HIGH, COLOR WHITE, BACKGROUND COLOR BLACK.
- B. TAGS: PLASTIC OR BRASS, 1 1/2 INCH DIAMETER, WITH ENGRAVED OR STAMPED BLACK LETTERS WITH LIGHT CONTRASTING BACKGROUND COLOR. USE TAGS FOR VALVES AND PIPING SMALLER THAN 3/4 INCH. INSTALL TAGS WITH CORROSION RESISTANT CHAIN. PROVIDE TYPED LIST OF TAGS INCLUDING LOCATION AND SERVICE.
- C. PLASTIC PIPE MARKERS: FACTORY FABRICATED, FLEXIBLE, PREFORMED TO PIPE SIZE OR VINYL FILM TAPE, INDICATING FLOW DIRECTION ARROW AND IDENTIFICATION OF FLUID BEING CONVEYED.
- D. ACCEPTABLE MANUFACTURERS ARE BRADY, KOLBI, SETON OR APPROVED EQUAL.

PART 9: PLUMBING INSULATION:

- A. ALL INSULATION, INCLUDING JACKET, OR FACING AND ADHESIVE USED TO ADHERE FACING OR JACKET TO THE INSULATION SHALL HAVE A COMPOSITE FIRE AND SMOKE HAZARD RATING TESTED BY THE PROCEDURE RECOMMENDED BY ASTM E84, NFPA 255 OR U.L. 723, NOT EXCEEDING FLAME SPREAD 25, SMOKE DEVELOPED 50. ALL INSULATION ACCESSORIES SHALL ALSO HAVE THE RATINGS LISTED ABOVE.
- B. ABOVE GRADE HOT AND COLD WATER LINES WILL BE INSULATED WITH RIGID, MOLDED FIBERGLASS WITH VAPOR BARRIER. MAINS 1 INCH THICK AND BRANCH LINES SERVING INDIVIDUAL FIXTURES, 1/2 INCH. PROVIDE PVC JACKET FOR FITTINGS, JOINTS AND VALVES. MITERED AND MASTIC FIBERGLASS NOT ACCEPTABLE.
1. ACCEPTABLE MANUFACTURERS ARE OWENS CORNING, JOHNS MANVILLE, KNAUF, CERTAINTED OR APPROVED EQUAL.
- C. BELOW GRADE HOT AND COLD WATER LINES WILL BE INSULATED WITH PREFORMED CLOSED CELL FLEXIBLE ELASTOMERIC CELLULAR RUBBER INSULATION, RATED FOR DIRECT BURIAL, 1 INCH THICK. PROVIDE PVC PIPE SLEEVE AT CONCRETE PENETRATIONS.
1. ACCEPTABLE MANUFACTURERS ARE ARMACELL, AEROFLEX, NOMACO OR APPROVED EQUAL.
- D. INSULATION INSERTS AND SHIELDS: PROVIDE GALVANIZED STEEL SHIELD AND INSERT ON ALL PIPING TO PROVIDE 180 DEGREE COVERAGE ON BOTTOM OF SUPPORTED PIPING AND FULL 360 DEGREE COVERAGE ON CLAMPED PIPING. 1 INCH THICK.
1. ACCEPTABLE MANUFACTURERS ARE B-LINE, ANVIL OR APPROVED EQUAL.

PART 10: - PLUMBING PIPING:

- A. SANITARY WASTE LINES AND VENTS BELOW AND ABOVE GRADE SHALL BE PVC PIPE: ASTM D 2665 SCHEDULE 40 WITH SOLVENT WELDED PVC FITTINGS. USE SERVICE WEIGHT CAST IRON PIPE IN ONE HOUR OR GREATER FIRE RATED WALLS. PROVIDE CAST IRON PIPE SLEEVE AT FOUNDATION WALL PENETRATIONS.
- B. ABOVE GRADE DOMESTIC COLD AND HOT WATER LINES SHALL BE COPPER TUBE WITH SOLDERED COPPER FITTINGS OR MECHANICAL PRESS FITTINGS:
1. ASTM B 88, TYPE "L", H (DRAWN) TEMPER.
2. FITTINGS: ASME B16.18, CAST COPPER ALLOY OR ASME B16.22, WROUGHT COPPER AND BRONZE.
3. JOINTS: ASTM B 32, ALLOY SN95 SOLDER.
4. COPPER PRESS FIT JOINTS SHALL BE DOUBLE PRESSED TYPE AND UTILIZE EPDM SEALING ELEMENTS. JOINTS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURERS INSTALLATION INSTRUCTIONS.
- C. CONCEALED BRANCH LINES FOR ABOVE GRADE DOMESTIC COLD AND HOT WATER LINES: COPPER OR PEX-g TUBING.
1. COPPER ASTM B 88, TYPE "L", H (DRAWN) TEMPER.
2. CROSS-LINKED POLYETHYLENE TUBING (PEX-g) ASTM F876, ASTM F877, NFS 61. FITTINGS ASTM F 1960.
- D. BELOW GRADE UNDER BUILDING DOMESTIC COLD AND HOT WATER LINES SHALL BE:
1. ASTM B 88, TYPE "X", (SOFT) TEMPER. ASME B16.26 CAST BRONZE. NOT JOINTS BELOW GRADE.
2. CROSS-LINKED POLYETHYLENE TUBING (PEX-g) ASTM F876, ASTM F877, NFS 61. NO JOINTS BELOW GRADE.
- E. ALL WATER PIPING SHALL BE APPROVED FOR CONTACT WITH POTABLE WATER IN ACCORDANCE WITH NSF 61 AND NSF 14.
- F. NATURAL GAS PIPING:
1. BELOW GRADE BEYOND BUILDING: MEDIUM DENSITY POLYETHYLENE PIPE (MDPE), ASTM D2513, SDR 11 WITH FUSION WELDED JOINTS. EXTERIOR USE ONLY.
2. ABOVE GRADE: STANDARD WEIGHT BLACK STEEL PIPE ASTM A 53 SCHEDULE 40, WITH WELDED JOINTS OR MALLEABLE IRON THREADED FITTINGS. JOINTS: NFPA 54 OR WELDED TO ASME B31.1.
3. EQUIPMENT CONNECTIONS: CORRUGATED STAINLESS STEEL TUBING (CSST), ANSI LC-1 STANDARD, ASTM A240, TYPE 304. UV RESISTANT POLYETHYLENE JACKET, MECHANICAL TYPE FITTINGS. DO NOT USE FOR PIPE MAINS.
4. PROVIDE A GAS SHUT-OFF VALVE IN THE MAIN GAS RISER PRIOR TO ENTERING THE BUILDING.
5. GAS PIPING TO APPLIANCES, ROOFTOP EQUIPMENT, FURNACES, WATER HEATERS OR ANY OTHER GAS-FIRED EQUIPMENT SHALL BE FURNISHED WITH A SHUT-OFF VALVE AND DRIP LEG PRIOR TO ENTERING THE EQUIPMENT. PROVIDE PRESSURE REGULATOR AS REQUIRED BY APPLIANCE AND GAS PRESSURE AVAILABLE.
G. ALL ABOVE GRADE EXTERIOR GAS PIPE SHALL BE DEGRADED, PRIMED AND PAINTED YELLOW WITH PIPE IDENTIFICATION MARKERS EVERY 5'-0" PER IFGC.
- H. DISINFECTION OF DOMESTIC WATER SYSTEM: WATER DISTRIBUTION SYSTEM SHALL BE DISINFECTED PER STATE AND LOCAL CODES.

PART 11: - PLUMBING SPECIALTIES:

- A. DRAINS AND CLEANOUTS: ZURN, WADE, JR SMITH, OR APPROVED EQUAL.
- B. TRAP PRIMERS: SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, ZURN, OR APPROVED EQUAL.
- C. WATER HAMMER ARRESTORS: WATTS, SIOUX CHIEF OR ZURN OR APPROVED EQUAL.
- D. THERMOSTATIC MIXING VALVE: WATTS, LAWLER OR APPROVED EQUAL.
- E. VALVES: WATTS, CONBRACO INDUSTRIES, WEBSTONE OR APPROVED EQUAL.
- F. SANITARY BACKWATER VALVES: RECTORSEAL, OATEY OR APPROVED EQUAL.

PART 12: - PLUMBING EQUIPMENT:

- A. WATER HEATERS: NAVIEN, OR APPROVED EQUAL.
- B. THERMAL EXPANSION TANKS: AMTROL, WESSEL, ZILMET OR APPROVED EQUAL.
- C. CIRCULATION PUMPS: GRUNDFOS, ARMSTRONG, BELL & GOSSETT OR APPROVED EQUAL.
- D. REFER TO PLUMBING SCHEDULES ON PLANS.

PART 13: - PLUMBING FIXTURES:

- A. LAVATORIES: AMERICAN STANDARD, KOHLER OR APPROVED EQUAL.
1. FAUCET: MOEN, CHICAGO FAUCET, T&S BRASS OR APPROVED EQUAL.
2. ACCESSORIES: MCGUIRE, DEARBORN BRASS OR APPROVED EQUAL.
- B. WATER CLOSETS: AMERICAN STANDARD, KOHLER OR APPROVED EQUAL.
1. SEATS: BEMIS, KOHLER OR APPROVED EQUAL.
2. FLUSH VALVES: SLOAN, ZURN, OR APPROVED EQUAL.
3. FIXTURE CARRIERS: WADE, ZURN, WATTS OR APPROVED EQUAL.
- C. URINALS: AMERICAN STANDARD, KOHLER OR APPROVED EQUAL.
1. FLUSH VALVES: SLOAN, ZURN, OR APPROVED EQUAL.
- D. SHOWER TRIM: BRADLEY, MOEN, ACORN OR APPROVED EQUAL.
1. ADA COMPLIANT.
2. SHOWER ENCLOSURE BY GENERAL CONTRACTOR.
- E. ACCESS PANELS: ACUDOR, ELMODOR OR APPROVED EQUAL.
- F. ELECTRIC WATER COOLER STATION: ELKAY, OASIS, HALSEY TAYLOR OR APPROVED EQUAL.

- G. WALL HYDRANTS: WOODFORD, OR APPROVED EQUAL.

- H. SUPPLY STOP VALVES: COMMERCIAL GRADE, QUARTER-TURN STYLE: MCGUIRE, BRASSCRAFT OR APPROVED EQUAL.
- I. REFER TO PLUMBING SCHEDULES ON PLANS.

PART 14: - INSTALLATION:

- A. FURNISH AND INSTALL A COMPLETE PLUMBING SYSTEM AS INDICATED ON THE PLUMBING PLANS. TEST AND ADJUST EQUIPMENT AND FIXTURES FOR PROPER OPERATION.
- B. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- C. PROVIDE TRACER WIRE FOR BELOW GRADE NON-METALLIC PIPING.
- D. PIPE HANGERS AND SUPPORTS INSTALLED IN ACCORDANCE WITH ASME B31.9, MSS SP-58, MSS SP-69, MSS SP-89 AND SPACING PER CODE. INSTALL HANGERS WITHIN 12" OF ALL ELBOWS AND BRANCH CONNECTIONS.

- E. ROUTE PIPING IN ORDERLY MANNER, MAINTAIN GRADIENT AND ALLOW FOR EXPANSION AND CONTRACTION.

- F. INSTALL VENT PIPING PENETRATING SIDEWALLS TO MAINTAIN INTEGRITY OF WALL ASSEMBLY.

- G. IDENTIFY VALVES WITH TAGS AND PIPING WITH PIPE MARKERS OR TAGS.

- H. PIPE INSULATION: INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND NAIMA NATIONAL INSULATION STANDARDS.

- I. INSULATED PIPES CONVEYING FLUIDS BELOW AMBIENT TEMPERATURE INCLUDING FITTINGS, VALVES, UNIONS, FLANGES, AND STRAINERS.

- J. FOR HOT PIPING CONVEYING FLUIDS 140 DEGREES F OR LESS, DO NOT INSULATE FLANGES AND UNIONS AT EQUIPMENT, BUT BEVEL AND SEAL ENDS OF INSULATION.

- K. INSULATE FITTINGS, JOINTS, AND VALVES WITH INSULATED PVC FITTING COVERS.

- L. INSULATION INSERTS AND SHIELDS: GALVANIZED STEEL BETWEEN PIPE HANGERS OR PIPE HANGER ROLLS AND INSERTS WITH 180 DEGREE COVERAGE ON BOTTOM OF SUPPORTED PIPING AND 360 DEGREE COVERAGE ON CLAMPED PIPING. LOCATE INSERT BETWEEN SUPPORT SHIELD AND PIPING AND UNDER THE FINISH JACKET. INSERT MINIMUM 6 INCHES LONG. INSERT MATERIAL OF HYDROUS CALCIUM SILICATE INSULATION OR OTHER HEAVY DENSITY INSULATING MATERIAL SUITABLE FOR THE PLANNED TEMPERATURE RANGE. INSERTS AND SHIELD ASSEMBLIES MAY BE FACTORY FABRICATED.

- M. EXPOSED PIPING: LOCATE INSULATION AND COVER SEAMS IN LEAST VISIBLE LOCATIONS

- N. SLEEVE PIPES PASSING THROUGH NON-RATED PARTITIONS, WALLS AND FLOORS: USE URETHANE CAULK IN ANNULAR SPACE BETWEEN PIPE INSULATION AND SLEEVE. CONTINUE INSULATION THROUGH WALLS, SLEEVES, PIPE HANGERS, AND OTHER PIPE PENETRATIONS. FINISH AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS. AT FIRE SEPARATIONS, FIRE CAULK AS REQUIRED.

- O. FIRE AND/OR SMOKE RATED PENETRATIONS: ALL FIRESTOPPING SYSTEMS SHALL BE PROVIDED BY THE SAME MANUFACTURER AND UL LISTED. USE A PRODUCT THAT HAS A RATING NOT LESS THAN THE RATING OF THE WALL OR FLOOR BEING PENETRATED. REFERENCE ARCHITECTURAL DRAWINGS FOR IDENTIFICATION OF FIRE AND/OR SMOKE RATED WALLS AND FLOORS.

- P. PIPING INSULATION SHALL BE CONTINUOUS THROUGH WALL PENETRATIONS.

- Q. INSTALL UNIONS AT EQUIPMENT CONNECTIONS. PROVIDE BALL VALVES TO ISOLATE EQUIPMENT AND PARTS OF SYSTEMS. PROVIDE BALL VALVE AT WATER SERVICE ENTRANCE.

- R. INSTALL DIELECTRIC UNIONS AT DISSIMILAR PIPE MATERIAL CONNECTION POINTS.

- S. INSTALL COMPONENTS LEVEL AND PLUMB. SEAL FIXTURES TO WALL AND FLOOR SURFACES WITH SEALANT COLOR TO MATCH FIXTURE.

- T. PLUMBING FIXTURE MOUNTING HEIGHT SHALL BE PER ARCHITECTURAL DRAWINGS.

- U. INSTALL FLOOR DRAINS AND CLEANOUTS FLUSH WITH FINISHED FLOOR.

- V. INSTALL BALL VALVES FOR SHUT-OFF AND TO ISOLATE EQUIPMENT, PARTS OF SYSTEMS OR VERTICAL RISERS.

- W. INSTALL UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS.

- X. PIPE WORK MUST BE PROPERLY TESTED AND APPROVED BEFORE BEING COVERED UP OR ENCLOSED.

- Y. TEST FIXTURES TO DEMONSTRATE PROPER OPERATION. REPLACE MALFUNCTIONING UNITS OR COMPONENTS.

- Z. CLEAN PLUMBING FIXTURES AND EQUIPMENT.

- AA. PROTECT INSTALLED PRODUCTS FROM DAMAGE DUE TO SUBSEQUENT CONSTRUCTION OPERATIONS.

- AB. DO NOT PERMIT USE OF FIXTURES BY CONSTRUCTION PERSONNEL.

- AC. REPAIR OR REPLACE DAMAGED PRODUCTS BEFORE DATE OF SUBSTANTIAL COMPLETION.

- AD. DISINFECT WATER PIPING SYSTEM PER STATE AND LOCAL CODES.

- AE. PIPING LEAK TESTS: PERFORM LEAK TESTS ON DOMESTIC WATER SYSTEMS, WASTE & VENT SYSTEMS AND NATURAL GAS SYSTEMS PER STATE AND LOCAL CODES.

AF. SERVICE CONNECTIONS:

- CONNECT NEW COLD WATER PIPE TO EXISTING COLD WATER MAIN IN ADJACENT BUILDING. FIELD VERIFY LOCATION.
- CONNECT NEW SANITARY PIPING TO EXISTING SANITARY PIPING. CONNECT NEW SANITARY SEWER TO EXISTING SANITARY SEWER 5'-0" BEYOND NEW ADDITION. FIELD VERIFY INVERT ELEVATIONS AND LOCATION. REROUTE EXISTING SANITARY SEWER AROUND NEW ADDITION. FIELD VERIFY LOCATION.
- PROVIDE NEW NATURAL GAS SERVICE FROM GAS LINE BROUGHT TO BUILDING BY SITE CONTRACTOR. COORDINATE NATURAL GAS NEW LOAD WITH LOCAL GAS UTILITY.

PART 15: - WALK THRU:

- A. THE CONTRACTOR SHALL PERFORM AN INSTRUCTIONAL WALK THRU WITH THE OWNER TO EXPLAIN THE OPERATION AND MAINTENANCE OF THE PLUMBING SYSTEM.