

PLUMBING SYSTEMS PIPING SPECIFICATIONS

GENERAL

1. PRINCIPAL ITEMS OF WORK INCLUDED:
 - A. SOIL PIPING.
 - B. DRAIN, WASTE AND VENT PIPING (DWV).
 - C. INDIRECT WASTE PIPING.
 - D. HOT AND COLD DOMESTIC WATER SYSTEM.
 - E. ROOF AND OVERFLOW DRAINS, ROOF LEADERS, AND RAIN WATER DRAINAGE PIPING.
 - F. VALVES AND ACCESSORIES.
 - G. UTILITY CONNECTION REQUIREMENTS.
 - H. POTABLE WATER SYSTEM DISINFECTION.
 - I. PLUMBING FIXTURES AND WATER HEATER PER DRAWINGS.
 - J. BACKFLOW PREVENTER.
2. RELATED WORK SPECIFIED ELSEWHERE:
 - A. TRENCHING AND BACKFILL- SECTION EARTHWORK.
 - B. FIXTURES AND EQUIPMENT- SEE PLUMBING FIXTURE SCHEDULE ON DRAWINGS.
 - C. PAINTING- SECTION PAINTING.

3. REQUIREMENTS:

- A. CODES:
 - I. INTERNATIONAL MECHANICAL CODE
 - II. UNIFORM PLUMBING CODE
 - III. CALIFORNIA ADMINISTRATIVE CODE, TITLE 24 (WHERE REQUIRED)
 - IV. NATIONAL ELECTRICAL CODE (NEC)
 - V. APPLICABLE LOCAL CODES
 - VI. APPLICABLE SAFETY CODES
 - VII. AMERICANS WITH DISABILITIES ACT (ADA)
- B. STANDARDS:
 - I. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):
 1. A-53 STEEL, BLACK AND HOT DIPPED, ZINC COATED, WELDED AND SEAMLESS PIPE.
 2. B16.19 CAST BRONZE SOLDER-JOINT PRESSURE FITTINGS.
 3. B16.22 WROUGHT COPPER AND BRONZE SOLDER-JOINT PRESSURE FITTINGS.
 4. B16.23 CAST COPPER ALLOY SOLDER-JOINT DRAINAGE FITTINGS-DWV.
 5. B16.26 CAST COPPER ALLOY FITTINGS FOR FLARED COPPER TUBES.
 6. B16.29 WROUGHT COPPER AND WROUGHT ALLOY SOLDER-JOINT DRAINING FITTINGS-DWV.
 7. B306 86 COPPER DRAINAGE TUBE (DWV).
 - II. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
 1. A-53 STEEL, BLACK AND HOT DIPPED, ZINC COATED, WELDED, AND SEAMLESS PIPE
 2. A-74 CAST IRON SOIL PIPE AND FITTINGS
 3. B-32 SOLDER METAL.
 4. B-88 SEAMLESS COPPER WATER TUBE.
 5. B-308 COPPER DRAINAGE TUBE (DWV).
 6. D-1785 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE, SCHEDULES 40 AND 80.
 7. D-2146 PROPYLENE PLASTIC MOLDING AND EXTRUDING MATERIALS.
 8. D-2466 SOCKET-TYPE PVC PLASTIC PIPE FITTINGS.
 9. D-2584 SOLVENT CEMENTS FOR PVC PLASTIC PIPE AND FITTINGS.
 10. D-2681 ABS SCHEDULE 40 PLASTIC DRAIN, WASTE AND VENT PIPE.
 11. D-2685 PVC PLASTIC DRAIN, WASTE AND VENT PIPE AND FITTINGS.
 12. D-2751 ABS SEWER PIPE AND FITTINGS.

C. SUBMITTALS.

- I. THREE (3) COPIES OF CATALOG DATA SHEETS SHALL BE SUBMITTED TO OWNER'S CONSTRUCTION MANAGER FOR REVIEW. SUBMITTALS SHALL BE MADE AND FAVORABLE REVIEW OBTAINED BEFORE MATERIALS AND EQUIPMENT ARE INSTALLED. SUBMIT CATALOG DATA SHEETS FOR:
 1. VALVES AND ACCESSORIES.
 2. HANGERS AND SUPPORTS.
 3. CLEAN OUTS.
 4. DIELECTRIC CONNECTIONS.
 5. WATER HAMMER ARRESTORS.
 6. FLOOR SINKS AND FLOOR DRAINS.
 7. WATER HEATER AND ACCESSORIES.
 8. PLUMBING FIXTURES.
 9. BACK FLOW PREVENTER.

PRODUCTS

1. MATERIALS:
 - A. FOR MATERIALS APPLICATIONS SEE "MATERIALS SPECIFICATIONS" LATER IN THESE NOTES.
 - B. CAST IRON DWV PIPING SYSTEMS: ASTM A74.
 - C. COPPER DWV PIPING SYSTEMS: TYPE DWV COPPER PER ASTM B306.
 - D. COPPER PRESSURE PIPING SYSTEMS:
 - I.A. PIPE: SCHEDULE 40 COPPER PER ASTM B88.
 - I.B. FITTINGS: SOLDER-JOINT CAST BRONZE PER ANSI B16.18 OR WROUGHT COPPER PER ANSI B16.22.
 - I.C. FLANGES: CLASS 150 POUND BRONZE: NBCC, CHASE, OR APPROVED ALTERNATIVE.
 - I.D. UNIONS: SOLDER-END BRONZE: NBCC, CHASE, OR APPROVED ALTERNATIVE.
 - I.E. WATER VALVES.
 - I.F. BALL, 2-INCH AND SMALLER: 125 PSI WSP BRASS, SWEAT JOINTS: WATTS #8V5 OR APPROVED ALTERNATIVE.
 - I.G. CHECK VALVES: 150 PSI WSP, BRONZE BODY, SWEAT OR THREADED JOINTS: WATTS #CV OR CYS OR APPROVED ALTERNATIVE.
 - I.H. AIR VALVES: BRONZE, SCREWED END, 150 SWP, CRANE #41-J-B, STOCKHAM #120, OR APPROVED ALTERNATIVE.
 - I.I. QUICK CONNECT COUPLING: 1/2-INCH SIZE BRASS CONSTRUCTION, PARKER HANNIFIN, AMFLO, OR APPROVED ALTERNATIVE.
 - E. PVC PIPING SYSTEMS:
 - I.A. PIPING: SCHEDULE 40 PVC PER ASTM D1785 OR SCHEDULE 80 SOCKET WELD PER ASTM D2467.
 - I.B. FITTINGS AND FLANGES: PVC SCHEDULE 80 SOCKET WELD PER ASTM D2467.
 - I.C. WATER VALVES: SAME AS FOR COPPER PIPING.
 - I.D. JOINTS IN PIPING:
 - I.E. COPPER SOLDER-JOINT.
 - I.F. PLASTIC SOCKET WELD AND FUSION WELD.
 - I.G. CAST IRON: COMPRESSION, OR NO-HUB JOINT.

2. EQUIPMENT:

- A. HANGERS AND SUPPORTS:
 - I. SPLIT-RING TYPE: GALVANIZED- GRINNELL, SUPERSTRUT, OR APPROVED ALTERNATIVE.
 - II. TRAPEZE TYPE, GALVANIZED- UNISTRUT, KINDORF, OR APPROVED ALTERNATIVE.
 - III. BOLTED STEEL CLAMPS, GALVANIZED- GRINNELL, SUPERSTRUT, OR APPROVED ALTERNATIVE.
 - IV. VERTICAL STRUT TYPE: UNISTRUT, KINDORF, OR APPROVED ALTERNATIVE.
- B. PIPING ISOLATORS: METAL-CLAD FELT TYPE SPECIFICALLY MADE FOR ISOLATING PIPE FROM HANGER: SEMCO TRISOLATORS, SUPERSTRUT TYPE CT-15 ISOLATOR, OR APPROVED ALTERNATIVE.
- C. WATER HAMMER ARRESTORS: J.R. SMITH HYDROKOL, ZURN SHOCKTROL, OR APPROVED ALTERNATIVE.
- D. BACK FLOW PREVENTER, REDUCED PRESSURE TYPE, BRONZE CONSTRUCTION, THREE-YEAR APPROVAL BY THE FOUNDATION FOR CROSS-CONNECTION CONTROL RESEARCH, UNIVERSITY OF SOUTHERN CALIFORNIA: FEBCO MODEL 835, BEECO, OR APPROVED ALTERNATIVE.
- E. DIELECTRIC CONNECTIONS, INSULATING UNIONS: CAPITOL, CLAYTON-MARK (PETRO), OR APPROVED ALTERNATIVE. FOR COLD WATER ONLY. SCHEDULE 80 PENTON, OR CPVC NIPPLES, 4-INCH LONG, MAY BE USED.

THESE AND OTHER EQUIVALENT ALTERNATIVES SHALL BE PRESENTED TO THE OWNER'S CONSTRUCTION MANAGER FOR CONSIDERATION PER THE SUBMITTALS SECTION.

EXECUTION

1. INSTALLATION GENERAL:
 - A. PIPING SHALL INCLUDE ALL PIPING, FITTINGS AND VALVES: CONNECT TO EXISTING PIPING UTILITIES AS INDICATED ON DRAWINGS.
 - B. CONCEAL ALL INTERIOR PIPING IN WALLS OR ABOVE CEILINGS, EXCEPT WHERE SHOWN TO BE EXPOSED.
 - C. PROVIDE EXPANSION AND CONTRACTION OF ALL PIPES.
 - D. PROVIDE FLARING FITTINGS FOR ALL CHANGES IN PIPE SIZE - DO NOT USE BUSHINGS.
 - E. PROVIDE DIELECTRIC ISOLATION BETWEEN DISSIMILAR METALS AND WHERE REQUIRED AT EQUIPMENT CONNECTIONS.
 - F. PROVIDE FITTINGS FOR ALL CHANGES IN PIPE DIRECTION.
 - G. CONTAMINATION PREVENTIONS: DO NOT CROSS-CONNECT OR INTERCONNECT BETWEEN POTABLE WATER PIPING AND DRAIN, WASTE, OR SEWER PIPING.
 - H. INSTALLATION SYSTEMS:
 - I. WATER PIPING:
 - A. COPPER TYPE 'L'.
 - B. PROVIDE SHUTOFF VALVES AS INDICATED OR REQUIRED.
 - C. PROVIDE DRAIN VALVES WHERE REQUIRED FOR COMPLETE SYSTEM DRAINAGE.
 - D. PROVIDE WATER HAMMER ARRESTORS SIZED AND LOCATED PER TABLE V, WH-201 OR AS SHOWN.
 - E. PROVIDE BACK FLOW PREVENTER WHERE SHOWN.
 - II. SANITARY PIPING:
 - I. GRADING: SLOPE HORIZONTAL SOIL AND WASTE PIPING 1/4-INCH PER FOOT WHERE POSSIBLE, BUT IN NO CASE LESS THAN 1/8-INCH PER FOOT.
3. INSTALLATION - TESTING:
 - A. ALL HOT AND COLD WATER SUPPLY, DRAINAGE, AND VENT PIPING SHALL BE TESTED AS INDICATED BELOW OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS MORE STRINGENT. NO PIPING SYSTEM SHALL BE COVERED UP OR BURIED UNTIL SUCCESSFULLY TESTED AND APPROVED BY THE OWNER AND THE LOCAL PLUMBING INSPECTOR.

A. WATER PIPING: UPON COMPLETION OF A SECTION, OR OF THE ENTIRE HOT AND COLD WATER SUPPLY SYSTEM, IT SHALL BE TESTED AND PROVED WATERTIGHT UNDER A WATER PRESSURE NOT LESS THAN THE WORKING PRESSURE UNDER WHICH IT IS TO BE USED, OR EIGHTY (80) PSIG, WHICHEVER IS HIGHER (VERIFY WITH THE LOCAL WATER COMPANY). THE WATER USED FOR TESTING SHALL BE OBTAINED FROM A POTABLE SOURCE OF SUPPLY. THE PIPING UNDER TEST SHALL WITHSTAND THE TEST WITHOUT LEAKING FOR A PERIOD OF NOT LESS THAN FIFTEEN (15) MINUTES. ANY SECTION OF PIPING FAILING THE TEST SHALL BE REPAIRED AND RETESTED, AS INDICATED ABOVE UNTIL SUCCESSFUL, HOLDING THE APPLIED PRESSURE FOR AT LEAST THE SPECIFIED TIME PERIOD.

B. DRAINAGE PIPING: UPON COMPLETION OF A SECTION, OR OF THE ENTIRE DRAINAGE AND VENTING SYSTEMS, THEY SHALL BE TESTED AND PROVED WATERTIGHT UNDER A WATER PRESSURE NOT LESS THAN A TEN (10) FOOT HEAD. IF THE SYSTEM IS TESTED IN SECTIONS, EACH OPENING SHALL BE TIGHTLY PLUGGED EXCEPT AT THE HIGHEST OPENING OF THE SECTION UNDER TEST, AND EACH SECTION SHALL BE FILLED WITH WATER TO A TEN (10) FOOT HEAD. IN TESTING SUCCESSIVE SECTIONS AT LEAST THE UPPER TEN (10) FEET OF THE NEXT PROCEEDING SECTION SHALL BE TESTED, SO THAT NO JOINT OR PIPE IN THE BUILDING SHALL HAVE BEEN TESTED TO LESS THAN TEN (10) FOOT HEAD OF WATER. THE WATER SHALL BE KEPT IN THE SYSTEM, OR IN THE SECTION UNDER TEST, FOR AT LEAST THIRTY (30) MINUTES AND MAINTAIN THE APPLIED PRESSURE WITHOUT LEAKING. ANY SECTION OF THE DRAINAGE OR VENT PIPING FAILING THE TEST SHALL BE REPAIRED AND RETESTED AS INDICATED ABOVE UNTIL SUCCESSFULLY HOLDING THE APPLIED PRESSURE FOR AT LEAST THE SPECIFIED TIME PERIOD.

4. GUARANTEE:

- A. ALL WORK SHALL BE GUARANTEED FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. THE GUARANTEE PERIOD FOR CERTAIN ITEMS SHALL BE LONGER, AS INDICATED IN THE SPECIFICATIONS FOR THOSE ITEMS.
- B. SHOULD ANY MALFUNCTION DEVELOP DURING THE GUARANTEE TIME PERIOD DUE TO DEFECTIVE MATERIAL, FAULTY WORKMANSHIP, OR NON-COMPLIANCE WITH PLANS, SPECIFICATIONS, CODES, OR DIRECTIONS OF THE OWNER, ARCHITECT, ENGINEER, OR INSPECTOR, THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR AND MATERIALS TO CORRECT THE MALFUNCTION WITHOUT ADDITIONAL CHARGES.

5. CLEANING:

- A. THE PLUMBING CONTRACTOR SHALL REMOVE ALL WASTE GENERATED BY THE PLUMBING WORKS ON A DAILY BASIS, AND KEEP THE JOB SITE CLEAR AND SAFE FROM ANY DEBRIS AND/OR ITEMS THAT FALL UNDER HIS RESPONSIBILITY. UPON COMPLETION OF THE PROJECT, THE PLUMBING WORKS SHALL BE CLEANED INCLUDING PLUMBING FIXTURES, WASTE LINES, WATER HEATERS, AND ANY OTHER PLUMBING DEVICES. THIS SHALL BE PERFORMED TO THE SATISFACTION OF THE OWNER OR THE OWNER'S REPRESENTATIVE AND SHALL OCCUR BEFORE FINAL ACCEPTANCE OF THE PROJECT. ALL DEBRIS AND WASTE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A SAFE MANNER AS REQUIRED BY LOCAL AND STATE AUTHORITIES.

6. MATERIALS SPECIFICATION:

- A. SANITARY SOIL, WASTE, AND VENT SYSTEMS: SOIL, WASTE, AND VENT PIPING SHALL BE SCHEDULE 40 PVC OR CAST IRON. BEFORE COMMENCEMENT OF WORK, CONTRACTOR SHALL VERIFY THAT PIPE TO BE INSTALLED COMPLIES WITH LOCAL CODES AND WILL BE ACCEPTABLE TO LOCAL BUILDING INSPECTORS. CONTRACTOR SHALL BEAR ALL COSTS FOR REMOVAL AND REPLACEMENT OF ANY UNACCEPTABLE PIPE. WHERE PVC IS UNACCEPTABLE, SOIL AND WASTE PIPING BELOW SLAB AND INCLUDING YARD PIPING SHALL BE STANDARD WEIGHT CAST IRON SOIL PIPE AND FITTINGS (NO HUB). THE COUPLINGS SHALL BE STAINLESS STEEL SHIELDS AND CLAMP WITH NEOPRENE GASKETS. VENT PIPING ABOVE FLOOR SHALL BE SCHEDULE 40 GALVANIZED STEEL WITH CAST IRON DRAINAGE PATTERN SCREW FITTINGS.
- B. WATER PIPING ABOVE AND BELOW SLAB: TYPE 'L'; HARD DRAWN COPPER TUBING WITH 95-5 TIN/ANTIMONY SOLDER OR APPROVED 'LEAD-LESS' JOINT FITTINGS.
- C. WATER PIPING BELOW GRADE OUTSIDE BUILDING: SCHEDULE 40 PVC, IF PVC IS UNACCEPTABLE TO LOCAL AUTHORITIES OR IF SOIL IS CONTAMINATED USE TYPE 'K'. HARD DRAWN COPPER TUBING WITH 95-5 TIN/ANTIMONY SOLDER OR APPROVED 'LEAD-LESS' JOINT FITTINGS. WHERE STREET PRESSURE EXCEEDS 80 PSI PROVIDE PRESSURE REDUCING VALVE ASSEMBLY COMPLETE WITH RELIEF VALVE. NO JOINTS WILL BE ALLOWED UNDER BUILDING SLAB.
- D. INDIRECT & CONDENSATE DRAINS: COPPER, TYPE 'M' WITH 95-5 TIN/ANTIMONY SOLDER JOINT FITTINGS. NO JOINTS WILL BE ALLOWED UNDER BUILDING SLAB.
- E. INSULATION: ALL COLD WATER LINES WITHIN THE BUILDING (IN AREAS WITH HIGH OUTDOOR HUMIDITY AND/OR TEMPERATURE OR LOW OUTDOOR TEMPERATURE ONLY) SHALL BE INSULATED WITH "PPG" INDUSTRIES, CERTAIN TEED SAINT GOBAIN SNAP-ON OR JOHN MANSVILLE INSULATION. ALL HOT WATER LINES WITHIN THE BUILDING SHALL BE INSULATED WITH "PPG" INDUSTRIES, CERTAIN TEED SAINT GOBAIN SNAP-ON OR JOHN MANSVILLE MICRO-LOC, EXCEPT IN THE CEILING SPACE WHICH SHALL BE JOHN MANSVILLE AEROTUBE FOAM PLASTIC PIPE INSULATION. HOT AND COLD WATER INSULATION SHALL BE 1" THICK OR PER LOCAL CODES. EXPOSED HOT AND COLD WATER PIPES, AND TRAPS BELOW RESTROOM LAVATORIES SHALL BE INSULATED WITH 'TRUEBRO' INSULATION KIT, SEE PLUMBING SCHEDULE. ALL HVAC CONDENSATE DRAINS INCLUDING WASTE LINES FROM EVAPORATIVE COOLERS SHALL BE INSULATED WITH 1/2" THICK JOHN MANSVILLE AEROTUBE FOAM PLASTIC PIPE INSULATION.
- F. WATER HAMMER ARRESTORS: ALL STAINLESS STEEL. CONSTRUCTION BELLOWS-TYPE, PD1 APPROVED AND CERTIFIED SIZING AND PLACEMENT CONFORMING TO PLUMBING AND DRAINAGE INSTITUTE STANDARD PDI-WH 201 LATEST EDITION AND AS MANUFACTURED BY J.R. SMITH, ZURN, OR PFF, INC.

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NO.	DATE	BY	DESCRIPTION	REVISIONS

PLUMBING SPECIFICATIONS
 CALIBER COLLISION
 2300 GREEN RD
 LAKE LAND, FL
 PROJECT NO. 192006

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 DRAWN BY: BPH
 DATE: 08/19/2020
 REVIEWED BY: MS

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