

three inches = one foot
one and one half inches = one foot
two inches = one foot
one inch = one foot
three quarters inch = one foot
three eighths inch = one foot
one half inch = one foot
one quarter inch = one foot
one eighth inch = one foot
16
8
4
0
Revisions: Date

DIVISION 22 PLUMBING SPECIFICATIONS

GENERAL:

DIVISION 01 SHALL APPLY TO THIS SPECIFICATION.
ALL WORK SHALL BE ACCOMPLISHED BY SKILLED TRADESMEN ORDINARILY INVOLVED IN THE WORK PERFORMED. ALL WORK SHALL BE NEAT AND PROFESSIONAL IN APPEARANCE. ALL PLUMBING WORK SHALL MEET THE REQUIREMENTS OF THE 2013 CALIFORNIA PLUMBING CODE, AND ANY AUTHORITY HAVING JURISDICTION.
DEFINITIONS:
OWNER SHALL MEAN THE DESIGNATED PROJECT CO (CONTRACTING OFFICER) / COR (CONTRACTING OFFICER'S REPRESENTATIVE) FOR THE NCA INCLUDING THE ARCHITECT, ENGINEER, OR ANY OTHER REPRESENTATIVE OR AGENT OF THE VA.
PROVIDED SHALL MEAN PROVIDED AND INSTALLED UNLESS CLEARLY STATED THAT THE ITEM IS TO BE INSTALLED BY OTHER CONTRACTOR.
INSTALLED SHALL MEAN PROVIDED AND INSTALLED UNLESS IT IS CLEARLY STATED THAT THE ITEM WILL BE SUPPLIED BY ANOTHER ENTITY AND INSTALLED BY THIS CONTRACTOR.

QUALITY ASSURANCE:
ALL WORK SHALL BE COORDINATED WITH ALL AFFECTED TRADES PRIOR TO STARTING WORK. REWORK REQUIRED DUE TO COORDINATION ISSUES SHALL BE DONE BY THE INSTALLATION CONTRACTOR WITHOUT INCREASED COST TO THE OWNER.
CARE SHALL BE EXERCISED IN THE STORAGE AND HANDLING OF EQUIPMENT AND PIPING MATERIAL TO BE INCORPORATED IN THE WORK. DEBRIS ARISING FROM CUTTING, THREADING, AND WELDING OF PIPING SHALL BE REMOVED.
EQUIPMENT AND MATERIAL PLACED ON THE JOB SITE SHALL REMAIN IN THE CUSTODY OF THE CONTRACTOR UNTIL PHASED ACCEPTANCE, WHETHER OR NOT THE OWNER HAS REIMBURSED THE CONTRACTOR FOR THE EQUIPMENT AND MATERIAL. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF SUCH EQUIPMENT AND MATERIAL AGAINST ANY DAMAGE.
DAMAGED EQUIPMENT SHALL BE REPLACED WITH AN IDENTICAL UNIT AS DETERMINED AND DIRECTED BY THE OWNER'S REPRESENTATIVE. SUCH REPLACEMENT SHALL BE AT NO ADDITIONAL COST OR ADDITIONAL TIME TO THE OWNER.

IDENTIFICATION
INTERIORS OF NEW EQUIPMENT AND PIPING SYSTEMS SHALL BE PROTECTED AGAINST ENTRY OF FOREIGN MATTER. BOTH INSIDE AND OUTSIDE SHALL BE CLEANED BEFORE PAINTING OR PLACING EQUIPMENT IN OPERATION.
ALL PIPING SHALL BE PROTECTED FROM DIRT AND DEBRIS. CAP OR PLUG ALL PIPING STORED ON SITE. SYSTEM SHALL BE KEPT CLOSED, EXCEPT WHEN DIRECT WORK ON THE SYSTEM REQUIRES PIPING TO BE OPEN.

IDENTIFICATION
THE PURPOSE OF THIS PROJECT IS TO SERVE THE FLOWERING STATIONS WITH WATER FROM POTABLE SOURCES. HOWEVER, THE SYSTEM ONCE ON THE DISCHARGE OF THE REDUCED PRESSURE ZONE BACKFLOW PREVENTOR ASSEMBLY IS TO BE NON-POTABLE WATER. NON-POTABLE WATER SYSTEMS SHALL BE COLOR CODED PURPLE IN ACCORDANCE WITH THE CALIFORNIA PLUMBING CODE CHAPTER 17 REGARDLESS OF THE APPLICABILITY OF THE SYSTEM TO THIS CHAPTER.
SUBMITTALS
SUBMIT PIPE TYPE AND LISTING CERTIFICATE, PIPING ASSEMBLY METHODS AND FITTING TYPES TO BE INSTALLED TO THE COR. PROVIDE COORDINATION DRAWING SHOWING THE JANITOR CLOSET AT 1/4" = 1' SCALE SHOWING EXISTING MECHANICAL AND ELECTRICAL SYSTEMS, NEW PIPING AND EQUIPMENT LAYOUT WITH DIMENSIONED MAINTENANCE CLEARANCE AREAS, AND VALVE LOCATIONS. ALL SUBMITTALS IN ACCORDANCE WITH SECTION 01 00 00 GENERAL REQUIREMENTS AND SECTION 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
MAINTENANCE AND OPERATING MANUALS IN ACCORDANCE WITH SECTION 01 00 00, GENERAL REQUIREMENTS, ARTICLE, INSTRUCTIONS, FOR SYSTEMS AND EQUIPMENT, INCLUDE COMPLETE LIST INDICATING ALL COMPONENTS OF THE SYSTEMS WITH DIAGRAMS OF THE INTERNAL WIRING FOR EACH ITEM OF EQUIPMENT. INCLUDE LISTING OF RECOMMENDED REPLACEMENT PARTS FOR KEEPING IN STOCK SUPPLY, INCLUDING SOURCES OF SUPPLY, FOR EQUIPMENT SHALL BE PROVIDED. THE LISTING SHALL INCLUDE PARTS FOR EQUIPMENT: MANUFACTURER, MODEL NUMBER, SIZE, AND STYLE.
THE INSTALLING CONTRACTOR SHALL MAINTAIN AS-BUILT DRAWINGS OF EACH COMPLETED PHASE FOR VERIFICATION AND SHALL PROVIDE THE COMPLETE SET AT THE TIME OF FINAL SYSTEMS CERTIFICATION TESTING.
CERTIFICATION DOCUMENTATION SHALL BE PROVIDED PRIOR TO SUBMITTING THE REQUEST FOR FINAL INSPECTION. THE DOCUMENTATION SHALL INCLUDE ALL TEST RESULTS, THE NAMES OF INDIVIDUALS PERFORMING WORK FOR THE TESTING AGENCY ON THIS PROJECT, DETAILED PROCEDURES FOLLOWED FOR ALL TESTS, AND A CERTIFICATION THAT ALL RESULTS OF TESTS WERE WITHIN LIMITS SPECIFIED.

PRODUCTS AND MATERIALS:
PIPING
WATER PIPING, EXTERIOR AND BELOW GRADE.
FOLLOW SPECIFICATION SECTION 32 84 00 PLANTING IRRIGATION
WATER PIPING, INDOORS ABOVE GRADE
COPPER TUBE: ASTM B88 (ASTM B88M), TYPE L (B), DRAWN (H).
FITTINGS: ASME B16.18, CAST COPPER ALLOY OR ASME B16.22, WROUGHT COPPER AND BRONZE.
JOINTS: ASTM B32, ALLOY S95 SOLDER.

PIPE HANGERS AND SUPPORTS
PROVIDE HANGERS AND SUPPORTS THAT COMPLY WITH MSS SP-58.
IF TYPE OF HANGER OR SUPPORT FOR A PARTICULAR SITUATION IS NOT INDICATED, SELECT APPROPRIATE TYPE USING MSS SP-58 RECOMMENDATIONS. ENSURE DISSIMILAR METAL ISOLATION IS MAINTAINED THROUGHOUT FERROUS PIPING SYSTEMS.
OVERHEAD SUPPORTS: INDIVIDUAL STEEL ROD HANGERS ATTACHED TO STRUCTURE OR TO TRAPEZE HANGERS.
TRAPEZE HANGERS: WELDED STEEL CHANNEL FRAMES ATTACHED TO STRUCTURE.
VERTICAL PIPE SUPPORT: STEEL RISER CLAMP.
COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
PLUMBING PIPING - WATER:
WALL SUPPORT FOR PIPE SIZES TO 3 INCHES (80 MM): COPPER ADJUSTABLE CLEVIS HANGER.
COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
HANGER FASTENERS: ATTACH HANGERS TO STRUCTURE USING APPROPRIATE FASTENERS, AS FOLLOWS:
CONCRETE WEDGE EXPANSION ANCHORS: COMPLYING WITH ICC-ES AC193.
MASONRY WEDGE EXPANSION ANCHORS: COMPLYING WITH ICC-ES AC01.
CONCRETE SCREW TYPE ANCHORS: COMPLYING WITH ICC-ES AC193.
MASONRY SCREW TYPE ANCHORS: COMPLYING WITH ICC-ES AC106.
CONCRETE ADHESIVE TYPE ANCHORS: COMPLYING WITH ICC-ES AC308.

BALL VALVES
CONSTRUCTION, 4 INCHES (100 MM) AND SMALLER: MSS SP-110, CLASS 150, 400 PSI (2760 KPA) CWP, BRONZE, BODY, REGULAR PORT, TEFLON SEATS AND STUFFING BOX RING, BLOW-OUT PROOF STEM, LEVER HANDLE WITH BALANCING STOPS, THREADED, ENDS WITH UNION.

STRAINERS
SIZE 2 INCH (50 MM) AND UNDER:
THREADED BRASS BODY FOR 175 PSI (1200 KPA) CWP, Y PATTERN WITH 1/32 INCH (0.8 MM) STAINLESS STEEL PERFORATED SCREEN.
CLASS 150, THREADED BRONZE BODY 300 PSI (2070 KPA) CWP, Y PATTERN WITH 1/32 INCH (0.8 MM) STAINLESS STEEL PERFORATED SCREEN.
REDUCED PRESSURE ZONE BACKFLOW PREVENTOR ASSEMBLIES (RPZ)
ASSE 1013 REDUCED PRESSURE ZONE BACKFLOW ASSEMBLY COMPLETE WITH INLET STRAINER, INLET AND OUTLET BALL OR NON-RISING STEM GATE ISOLATION VALVES. SIZE FOR MAXIMUM PRESSURE DROP OF 13 PSIG AT 13.7 GPM. CONSTRUCTED OF BRONZE OR EPOXY COATED CAST IRON BODY WITH BRONZE AND PLASTIC INTERNAL PARTS, STAINLESS STEEL SPRINGS, NON-THREADED VENT OUTLET, 4 TEST COCKS, RATED FOR 175 PSIG AND 2100F. WITH AIR GAP APPARATUS ON DRAIN. WATTS SERIES 919-S-QT-AG, WILKINS #975 OR APPROVED EQUAL.

VALVE BOXES
FOLLOW SPECIFICATION SECTION 32 84 00 PLANTING IRRIGATION

TRACER WIRE / TAPE
FOLLOW SPECIFICATION SECTION 31 20 11 EARTH MOVING (SHORT FORM)

WATER SPIGOT ASSEMBLIES / FLOWER WATER HYDRANT CONNECTION ASSEMBLIES
FOLLOW SPECIFICATION SECTION 32 30 00 SITE FURNISHINGS AND SECTION 32 84 00 PLANTING IRRIGATION

EXECUTION
GENERAL:
PERFORM ALL WORK IN ACCORDANCE WITH THE 2013 CALIFORNIA PLUMBING CODE AND ANY AUTHORITY HAVING JURISDICTION.
INSTALL BACKFLOW PREVENTERS IN ACCORDANCE WITH THE CALIFORNIA PLUMBING CODE REQUIREMENTS MAINTAINING MINIMUM CLEARANCE DISTANCES FOR SERVICING AND TESTING AS REQUIRED BY CODE AND RECOMMENDED BY THE MANUFACTURER. PROVIDE INDIRECT WASTE PIPING WITH AIR GAP INSTALLATION FROM RELIEF OPENING TO DRAIN. ENSURE PROPER PERMITS AND INSPECTIONS ARE EXECUTED BEFORE PLACING SYSTEM IN SERVICE.
ENSURE DISSIMILAR METAL CONTACT IS PREVENTED IN ALL INSTANCES. PROVIDE DIE ELECTRIC UNION AT METALLIC PIPING CONNECTIONS TO ALL NON-FERROUS CONNECTIONS. ENSURE ALL HANGERS IN CONTACT WITH COPPER PIPING IS INSULATED THROUGH NEOPRENE BUSHINGS AND THE HANGER IS COPPER PLATED.

EXCAVATION, TRENCHING AND BACKFILL
FOLLOW SPECIFICATION SECTION 31 20 11 EARTH MOVING (SHORT FORM)

ABOVE GRADE PIPING
EXAMINATION
VERIFY THAT EXCAVATIONS ARE TO REQUIRED GRADE, DRY, AND NOT OVER-EXCAVATED.
PREPARATION
REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN END FERROUS PIPE.
REMOVE SCALE AND DIRT, ON INSIDE AND OUTSIDE, BEFORE ASSEMBLY.
PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES OR UNIONS.

INSTALLATION
INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINING DISSIMILAR METALS.
ROUTE PIPING IN ORDERLY MANNER AND MAINTAIN GRADIENT. ROUTE PARALLEL AND PERPENDICULAR TO WALLS.
INSTALL PIPING TO MAINTAIN HEADROOM, CONSERVE SPACE, AND DO NOT INTERFERE WITH USE OF SPACE. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
PROVIDE CLEARANCE FOR HANGERS FROM STRUCTURE AND OTHER EQUIPMENT FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
PVC PIPE: MAKE SOLVENT-WELDED JOINTS IN ACCORDANCE WITH ASTM D2855.
SLEEVE PIPES PASSING THROUGH PARTITIONS, WALLS, AND FLOORS.

PIPE HANGERS AND SUPPORTS:
INSTALL IN ACCORDANCE WITH ASME B31.9.
INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH (15 MM) SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
PLACE HANGERS WITHIN 12 INCHES (300 MM) OF EACH HORIZONTAL ELBOW.
USE HANGERS WITH 1-1/2 INCH (40 MM) MINIMUM VERTICAL ADJUSTMENT. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
WHERE SEVERAL PIPES CAN BE INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS.
PROVIDE COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.
SUPPORT CAST IRON DRAINAGE PIPING AT EVERY JOINT.

APPLICATION
INSTALL UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS.
INSTALL BRASS MALE ADAPTERS EACH SIDE OF VALVES IN COPPER PIPED SYSTEM. SOLDER ADAPTERS TO PIPE.
INSTALL BALL VALVES FOR SHUT-OFF AND TO ISOLATE EQUIPMENT, PART OF SYSTEMS, OR VERTICAL RISERS.

TOLERANCES
DRAINAGE PIPING: ESTABLISH INVERT ELEVATIONS WITHIN 1/2 INCH (10 MM) VERTICALLY OF LOCATION INDICATED AND SLOPE TO DRAIN AT MINIMUM OF 1/4 INCH PER FOOT (1:50) SLOPE.

DISINFECTION OF DOMESTIC WATER PIPING SYSTEM
DISINFECT WATER DISTRIBUTION SYSTEM IN ACCORDANCE WITH SECTION 33 1300.
PRIOR TO STARTING WORK, VERIFY SYSTEM IS COMPLETE, FLUSHED, AND CLEAN.
ENSURE PH OF WATER TO BE TREATED IS BETWEEN 7.4 AND 7.6 BY ADDING ALKALI (CAUSTIC SODA OR SODA ASH) OR ACID (HYDROCHLORIC).
INJECT DISINFECTANT, FREE CHLORINE IN LIQUID, POWDER, TABLET OR GAS FORM, THROUGHOUT SYSTEM TO OBTAIN 50 TO 80 MG/L RESIDUAL.
BLEED WATER FROM OUTLETS TO ENSURE DISTRIBUTION AND TEST FOR DISINFECTANT RESIDUAL AT MINIMUM 15 PERCENT OF OUTLETS.
MAINTAIN DISINFECTANT IN SYSTEM FOR 24 HOURS.
IF FINAL DISINFECTANT RESIDUAL TESTS LESS THAN 25 MG/L, REPEAT TREATMENT.
FLUSH DISINFECTANT FROM SYSTEM UNTIL RESIDUAL EQUAL TO THAT OF INCOMING WATER OR 1.0 MG/L. TAKE SAMPLES NO SOONER THAN 24 HOURS AFTER FLUSHING, FROM 10 PERCENT OF OUTLETS AND FROM WATER ENTRY, AND ANALYZE IN ACCORDANCE WITH AWWA C681.

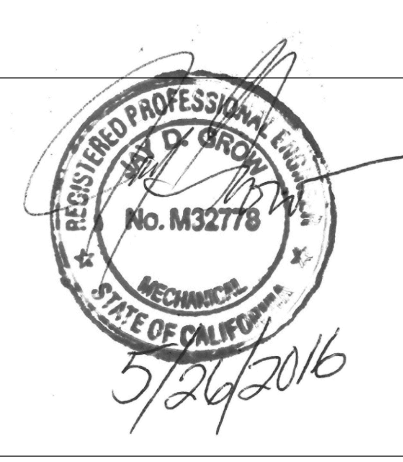
SPECIALTY PIPE FITTINGS
TRANSITION COUPLING SHALL BE INSTALLED AT PIPE JOINTS WITH SMALL DIFFERENCES IN PIPE OUTSIDE DIAMETERS.
DIELECTRIC FITTINGS SHALL BE INSTALLED AT CONNECTIONS OF DISSIMILAR METAL PIPING AND TUBING.
FINAL TESTS:
PROVIDE PIPING SYSTEMS TESTS IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE. SCHEDULE AND PROVIDE TESTS AND INSPECTION. INCLUDE ANY TEST RESULTS OR INSPECTION CERTIFICATION IN OWNER AND MAINTENANCE MANUALS FOR CLOSE OUT.

EXCAVATION AND BACKFILL
FOLLOW SPECIFICATION SECTION 31 20 11 EARTH MOVING (SHORT FORM)

BELOW GRADE PIPING
ESTABLISH ELEVATIONS OF BURIED PIPING OUTSIDE THE BUILDING TO ENSURE NOT LESS THAN 24" OF COVER WHERE POSSIBLE AND MAINTAIN A MINIMUM OF 18" COVER OR AS REQUIRED BY LOCAL AUTHORITIES IN ALL INSTANCES.
INSTALL BELL AND SPIGOT PIPE WITH BELL END UPSTREAM.
FOLLOW SPECIFICATION SECTION 32 84 00 PLANTING IRRIGATION

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