

DIVISION 22 PLUMBING

00 72 00 GENERAL CONDITIONS

A. SEE SHEET T2.0.

01 11 00 GENERAL REQUIREMENTS

- A. SEE SHEET T2.0.
- B. SUBSTITUTIONS
 1. CONTRACTOR SHALL PROVIDE ALL SUPPORTING DATA AND ASSUME THE BURDEN OF PROOF THAT ANY SUBSTITUTE IS EQUIVALENT AS TO APPEARANCE, CONSTRUCTION, CAPACITY, AND PERFORMANCE. THE JUDGMENT OF EQUIVALENCY SHALL BE MADE BY THE ENGINEER AT THE TIME OF SHOP DRAWING REVIEW, NOT DURING BIDDING.
 2. WHERE SUBSTITUTE EQUIPMENT REQUIRES REDESIGN OF ANY PART OF THE PROJECT, THE COST OF REDESIGN AND ADDITIONAL COSTS OF THE WORK SHALL BE PAID BY THE CONTRACTOR. REDESIGN SHALL BE SUBJECT TO THE APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION OVER THE WORK INCLUDING THE ARCHITECT/ENGINEER.
 3. CONTRACTOR SHALL ASSUME ALL COORDINATION RESPONSIBILITIES FOR SUBSTITUTE EQUIPMENT INCLUDING COORDINATION ACROSS TRADES AND COORDINATION OF PREVIOUSLY REVIEWED AND APPROVED SHOP DRAWING SUBMITTALS, SHOULD THESE SHOP DRAWINGS BE AFFECTED BY THE SUBSTITUTED EQUIPMENT.

09 91 00 FINISH AND PAINTING

- A. PREPARE EXPOSED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING IN ROOMS THAT WILL HAVE CEILING AND STRUCTURE PAINTED.
- B. COORDINATE WORK WITH THE PAINTERS SO THAT ALL EQUIPMENT IS INSTALLED PRIOR TO PAINTING. P.C. SHALL PAINT ITEMS IF NOT IN PLACE PRIOR TO NORMAL ROUTINE PAINTING.
- C. IF FINISH BECOMES RUSTED, CORRODED, SCRATCHED, OR FLAKED DURING STORAGE OR INSTALLATION, REFINISH THE EQUIPMENT TO THE SATISFACTION OF THE OWNER.
- D. WHERE THE PLUMBING CONTRACTOR IS REQUIRED TO PAINT, THE PAINTING SHALL BE DONE IN ACCORDANCE WITH THE PAINTING PORTION OF THE ARCHITECTURAL SPECIFICATION.

22 05 00 BASIC PLUMBING REQUIREMENTS

- A. PLUMBING CONTRACTOR SHALL VERIFY REQUIREMENTS FOR TEMPORARY WATER WITH GENERAL CONTRACTOR AND INCLUDE IN HIS SCOPE OF WORK WHEN DIRECTED BY G.C. INSTALL IN ACCORDANCE WITH ALL CODE AND OSHA REQUIREMENTS FOR CONSTRUCTION PROJECTS.
- B. DETAILS AND SCHEDULES ARE SHOWN TO AID THE CONTRACTOR AND ARE NOT MEANT TO BE INCLUSIVE OF ALL DEVICES. PROVIDE REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.
- C. INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND REQUIREMENTS. PROVIDE ADDITIONAL WORK AND MATERIALS AS REQUIRED.
- D. PROVIDE ALL STATE AND LOCAL PERMITS AND ANY OTHER RELATED FEES.
- E. REGULATORY REQUIREMENTS
 1. PROVIDE CERTIFICATE OF COMPLIANCE FROM AUTHORITY HAVING JURISDICTION INDICATING APPROVAL BACKFLOW PREVENTION DEVICES INSTALLATION.
 2. PERFORM WORK PER ALL LOCAL AND STATE CODES, ORDINANCES AND REGULATIONS HAVING JURISDICTION.
- F. COORDINATE INSTALLATION OF PLUMBING WORK WITH THE OTHER CONTRACTORS TO AVOID CONFLICTS WITH OTHER WORK.
- G. VERIFY CONNECTION REQUIREMENTS FOR EQUIPMENT FURNISHED BY OTHERS WITH FINAL SHOP DRAWINGS.
- H. CUTTING AND PATCHING
 1. PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR PLUMBING WORK INSTALLATION UNLESS THIS WORK IS IDENTIFIED TO BE THE WORK OF OTHER CONTRACTORS. PATCHING SHALL MATCH ADJACENT SURFACES. CORE DRILL OR SAW-CUT OPENINGS THROUGH EXISTING CONCRETE.
 2. P.C. SHALL PROVIDE SAWCUTTING, EXCAVATION, AND BACKFILL OF EXISTING FLOORS AS REQUIRED FOR INSTALLATION OF NEW UNDERGROUND PIPING. P.C. SHALL PROVIDE CONCRETE AND REINFORCING PER FLOOR SLAB SPECIFICATIONS IN REMOVED AREA OF THICKNESS TO MATCH EXISTING (FIELD VERIFY). PROVIDE DOWELS INTO EXISTING FLOOR SLAB. DOWEL DIAMETER SHALL BE MINIMUM ONE EIGHTH OF FLOOR SLAB THICKNESS. DOWEL LENGTH SHALL BE 12" FOR SLABS LESS THAN 6" THICK, 16" FOR SLABS 6-7" THICK, 18" FOR SLABS 8-9" THICK, AND 20" FOR SLABS GREATER THAN 9" THICK. DOWELS SHALL BE SPACED 12" O.C. AND PENETRATION IN EXISTING SLAB SHALL BE HALF THE LENGTH.
- I. FIRE RATED INTERIOR WALL AND FLOOR PIPE PENETRATIONS
 1. SLEEVE REQUIRED FOR PENETRATION OF CONCRETE AND MASONRY WALLS AND FLOORS.
 2. SEAL OUPROUND AROUND PIPE WITH A UL APPROVED FIRE-STOP SYSTEM HAVING AN F-RATING NOT LESS THAN THE HOURLY RATING OF THE ASSEMBLY BEING PENETRATED.
 3. WHERE A SLEEVE IS REQUIRED, FURNISH AND INSTALL SLEEVES FOR NEW DRYWALL WALLS AND CONCRETE WALLS AND FLOORS. FURNISH SLEEVES TO THE MASON CONTRACTOR FOR INSTALLATION IN NEW MASONRY WALLS. PROVIDE SLEEVE AND GROUT SLEEVE IN EXISTING MASONRY WALLS.
- J. SEALANTS
 1. PLUMBING CONTRACTOR SHALL PROVIDE ALL SEALANTS WHERE JOINT IS HIDDEN AND WHERE JOINT IS EXPOSED IN MECHANICAL ROOM.
 2. SEALANT CONTRACTOR SHALL PROVIDE SEALANTS AT ALL EXPOSED LOCATIONS IN FINISHED ROOMS.
- K. ESCUTCHEONS
 1. INSTALL ONE-PIECE (TWO PIECE FOR EXISTING PIPING) POLISHED CHROME PLATED STEEL ESCUTCHEONS AT PENETRATIONS EXPOSED IN FINISHED ROOMS (ROOMS WHICH DON'T HAVE UNFINISHED CONCRETE FLOORS).
 2. ESCUTCHEONS WITH SPRINGS FOR WALL AND CEILING LOCATIONS.
 3. ID TO CLOSELY FIT AROUND PIPE/INSULATION, OD THAT COMPLETELY COVERS THE OPENING.
 4. ESCUTCHEONS REQUIRED IN CABINETS AND CASEWORK.

22 05 19 METER AND GAUGES

- A. PREPARE GAUGES AND THERMOMETERS
 1. MANUFACTURERS: TRERICE, M.S. GAUGE, ASHCROFT, MARSH, WEISS, WEKSLER.
 2. PREPARE GAUGES
 - a. GENERAL PURPOSE: TRERICE 600CB CAST ALUMINUM CASE, PHOSPHOR BRONZE BUSHION TYPE, 4-1/2" DIAMETER, TRERICE 865/866-1 GAUGE COCK AND TRERICE 870-1 PRESSURE DAMPER.
 3. STEM THERMOMETERS:
 - a. GENERAL PURPOSE: TRERICE BX9, ASTM E1, ORGANIC SPIRIT LIQUID FILL, CAST ALUMINUM CASE WITH EPOXY FINISH, CAST ALUMINUM ADJUSTABLE JOINT WITH POSITIVE LOCKING DEVICE, 9" SCALE, 3/4" NPT BRASS STEM, WITH EXTENSIONS AS REQUIRED FOR INSULATION.
 4. SCALE RANGES AND MINIMUM INCREMENT AS FOLLOWS:

- a. COLD WATER: 0-100 PSIG/ 1 PSIG; 0-100 DEG F/ 1 DEG F
- b. HOT WATER: 0-100 PSIG/ 1 PSIG; 0-160 DEG F/ 2 DEG F.
- 5. EXTEND NIPPLES TO ALLOW INSULATION CLEARANCE.
- 6. INSTALL WHERE READ FROM NORMAL OPERATING LEVEL.
- 7. CALIBRATE FOR ACCURACY.

22 05 29 PIPE AND EQUIPMENT HANGERS AND SUPPORTS

- A. MANUFACTURERS: B-LINE, EMPIRE INDUSTRIES, GLOBAL PIPE HANGER PRODUCTS, GRINNELL, NATIONAL PIPE HANGER, UNI STRUT.
- B. PROVIDE SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION WHERE REQUIRED.
- C. ANGLES, CHANNELS, AND BEAMS: ASTM A36 AND A572 AS REQUIRED.
- D. HANGERS SHALL NOT BE ATTACHED TO JOIST BRIDGING.
- E. ATTACHMENT TO METAL DECK: HANGERS MAY BE ANCHORED TO METAL FLOOR/ROOF DECK IF ALL THE FOLLOWING CONDITIONS ARE MET:
 1. MAXIMUM HANGER LOAD OF 50 LBS.
 2. ANCHORED TO BOTTOM OF DECK FLUTES, NOT UPPER FLUTE.
 3. ANCHOR LENGTH SHALL EXCEED DECK DEPTH.
- F. PIPE HANGERS/SUPPORTS
 1. SEE DETAILS ON PLANS FOR ADDITIONAL PIPE HANGER SPECIFICATIONS.
 2. SEE SCHEDULE ON PLANS FOR HANGER SPACING.
 3. CONFORM TO ASME B31.9 AND MANUFACTURER'S STANDARDIZATION SOCIETY (MSS) SP-58-2009.
 4. MATERIALS
 - a. V BOTTOM CLEVIS HANGER: MSS SP-58 TYPE 1, B-LINE FIGURE B3106 AND FIGURE B3106V PRE-GALVANIZED PLASTIC PIPE SUPPORT CHANNEL FOR PEX PIPING TO INCREASE HANGER SPACING.
 5. INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADS AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT. ADJUST HANGERS TO DISTRIBUTE LOADS EQUALLY ON ATTACHMENTS AND TO PROVIDE INDICATED PIPE SLOPES.
- G. STRUT SYSTEM
 1. COMPLY WITH THE LATEST REVISION OF MFMA STANDARDS PUBLICATION NUMBER MFMA-3, "METAL FRAMING STANDARDS PUBLICATION".
 2. INSTALL STRUT IN ACCORDANCE WITH MFMA-102 "GUIDELINES FOR THE USE OF METAL FRAMING"; IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, AND WITH RECOGNIZED INDUSTRY PRACTICES.
 3. COLD FORMED LOW CARBON STEEL METAL FRAMING CHANNEL STRUT: B-LINE TYPE B CHANNEL.
 4. MANUFACTURER'S STANDARD FINISH OR PLAIN FINISH.
 5. 1-5/8 INCHES WIDE IN VARYING HEIGHTS AND WELDED COMBINATIONS AS REQUIRED TO MEET LOAD CAPACITIES.
- H. PROVIDE SUPPORT FOR UTILITY METERS IN ACCORDANCE WITH REQUIREMENTS OF UTILITY COMPANIES WHERE REQUIRED TO INSTALL METERS.

22 05 53 MECHANICAL IDENTIFICATION

- A. NAMEPLATES
 1. MANUFACTURERS: MARKING SERVICES, BRADY B-1, AND SETON SETONFLEX.
 2. 3/4" HIGH, 1/16" THICK PLASTIC WITH ENGRAVED WHITE LETTERS ON BLACK BACKGROUND COLOR, SCREW OR ADHESIVE MOUNTING.
 3. PROVIDE AT CONTROL PANELS AND STARTERS.
- B. VALVE TAGS
 1. MANUFACTURERS: MARKING SERVICES, W.H. BRADY, AND SETON NAME PLATE COMPANY.
 2. 1-1/2" DIAMETER 20 GAUGE BRASS TAG WITH STAMPED BLACK LETTERS. ATTACH WITH 5/65 #6 SOLID BRASS BEAD CHAIN.
 3. PROVIDE TYPEWRITTEN LETTER SIZE CHART.
 4. COORDINATE VALVE TAGS NOMENCLATURE/NUMBERING SEQUENCE/STARTING NUMBER WITH OWNER PRIOR TO ORDERING TAGS.
 5. ALL VALVES SHALL BE TAGGED EXCEPT DRAIN VALVES AND FIXTURE STOPS.
- C. SIGNAGE
 1. MANUFACTURERS: W.H. BRADY, MY SAFETY SIGN AND SETON NAME PLATE COMPANY.
 2. PLASTIC SIGN: MIN 4" WIDE x 2" HIGH, 1/16" THICK LAMINATE PLASTIC WITH ENGRAVED LETTERS. TWO HOLES PUNCHED, WITH VALVE CHAIN. WHITE BACKGROUND W/ RED LETTERS.
 3. PROVIDE AT MAIN WATER SHUTOFF VALVE IN MECHICAL ROOM FOR ASPEN DENTAL.
- D. PIPE IDENTIFICATION
 1. INDOOR SELF-ADHESIVE PIPE MARKERS
 - a. MANUFACTURERS: MARKING SERVICES MS-900, BRADY B-736, SETON OF TRADE.
 - b. FLEXIBLE PVC FILM WITH PRESSURE SENSITIVE ACRYLIC ADHESIVE BACKING WITH PRINTED MARKINGS.
 - c. SECURE WITH 2" WIDE TAPE WITH ARROWS INDICATING FLOW.
 2. COLOR, OVERALL SIZE AND LETTER HEIGHT SHALL CONFORM TO ASME A13.1-2007 "SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS".
 3. STENCILS: 2" HIGH LETTERS, SEMI-GLOSS ENAMEL BLACK PAINT.
 4. IDENTIFY PIPE SERVICE, FLOW DIRECTION, AND PRESSURE.
 5. LOCATIONS
 - a. LOCATE TO FACE GREATEST POINT OF VISIBILITY. ALL ADJACENT LABELS TO BE INSTALLED NEATLY IN A ROW.
 - b. LOCATE IDENTIFICATION NOT-TO-EXCEED 50 FEET FOR EXPOSED PIPING.
 - c. LOCATE IDENTIFICATION NOT-TO-EXCEED 25 FEET FOR PIPING ABOVE CEILINGS.
 - d. MINIMUM ONE LOCATION PER ROOM.
 - e. INSTALL IDENTIFICATION AFTER PIPING AND INSULATION IS COMPLETE TO ENSURE MAXIMUM VISIBILITY IDENTIFICATION SYSTEM.
 - f. BEHIND ACCESS PANELS AND ALL OTHER ACCESSIBLE POINTS OF SERVICE.
 - g. NEAR LOCATIONS WHERE PIPES PENETRATE WALLS, FLOORS OR CEILINGS.
 - h. NEAR EACH SERVICE AREA AND DEVICE.
 - i. AT EACH MAJOR PIECE OF EQUIPMENT.

22 07 00 INSULATION

- A. GENERAL INSULATION
 1. SEE INSULATION SCHEDULES ON PLANS FOR ADDITIONAL INFORMATION.
 2. INSULATION IN INSULATION SYSTEMS AND JACKETS SHALL MEET UL-723/ASTM E84 REQUIREMENTS OF MAX. FIRE HAZARD CLASSIFICATION OF 25, AND MAX. FLAME SPREAD, MEL CONTRIBUTED, AND SMOKE DEVELOPED OF 50 WHEN INSTALLED IN RETURN AIR ROOMS.
 3. INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND MICA PUBLICATION "COMMERCIAL AND INDUSTRIAL STANDARDS", 2011 SEVENTH EDITION.
 4. CONTINUE INSULATION WITHOUT INTERRUPTIONS THROUGH WALLS AND FLOOR PENETRATIONS AND HANGERS.
 5. REPAIR INSULATION ON EXISTING PIPING WHICH IS DAMAGED DUE TO CONNECTING OF NEW PIPING. MAINTAIN EXISTING VAPOR BARRIER INTEGRITY.
- B. FIBERGLASS (F.G.) INSULATION
 1. RIGID PIPING:
 - a. O.C. FIBERGLAS PIPE INSULATION, KNAUF EARTHWOOL PIPE INSULATION, JOHNS MANVILLE MICRO-LOK.
 - b. SINGLE OR DOUBLE ADHESIVE SELF-SEALING LAP SYSTEM FOR LONGITUDINAL JOINT, PRESSURE SENSITIVE BUTT STRIP SEALS, ALL SERVICE JACKET VAPOR BARRIER COVERING.
 - c. 3.5-5.5 LB./CU.FT., R=4.3 / NOMINAL INCH AT 75 DEG F.
 - d. MAX 850 DEG F, JACKET MAX 150 DEG F, 0.02 PERM.
 - e. COMPRESSIVE STRENGTH AT 10% DEFORMATION 125 LB./S.F.
 - f. SEMI-RIGID F.G. INSULATION MAY BE USED FOR PIPES 10" AND LARGER.
 - g. VALVES, FITTINGS, AND FLANGE COVERS:
 - 1). ZESTON 2000/300 SERIES, CEELCO 300 SERIES, PROTO LOSMOKE PVC JACKET
 - 2). HIGH IMPACT 30 MIL WHITE PVC WITH PRECUT FIBERGLASS INSERTS. MAX
- C. ELASTOMERIC FOAM INSULATION
 1. SEAL BUTT JOINTS WITH ADHESIVE.
 2. PIPE
 - a. MANUFACTURERS: AEROFLEX AEROCEL SSPT, K-FLEX INSUL-LOCK DS, ARMACELL AP/ARMAFLEX BLACK LAPSAL.
 - b. EPDM/PVC BASE ELASTOMERIC FOAM MATERIAL.
 - c. DUAL TAPE CLOSURE.
 - d. MAX. 'K' VALUE 0.245 AT 75 DEG F.
 - e. MAX. CONTINUOUS TEMPERATURE 220 DEG F.
 - f. MAX. 0.05 PERM PER ASTM E96.

- g. MAX. FIRE/SMOKE DEVELOPED OF 25/50 PER ASTM E84 FOR UP TO 2" THICK.
- h. PROVIDE MANUFACTURER PREFORMED INSULATION OVER VALVES AND FITTINGS.
- i. FIELD CUTTING AND GLUING LONGITUDINAL JOINT NOT PERMITTED.
- D. PIPE INSULATION REQUIREMENTS
 1. INSULATE ENTIRE PIPING SYSTEM INCLUDING VALVES AND FITTINGS PER MICA INSULATION STANDARDS PLATES 10 THRU 18.
 2. SEAL ALL INSULATION ENDS.

22 10 00 EXCAVATION AND BACKFILL

- A. P.C. SHALL EXCAVATE AND BACKFILL TRENCHES FOR PLUMBING WORK.
- B. MAINTAIN, PROTECT, AND TEMPORARILY SUPPORT ABOVE AND BELOW GRADE UTILITIES WHICH ARE TO REMAIN.
- C. PROVIDE AND MAINTAIN ALL FENCING, BARRICADES, SIGNS, WARNING LIGHTS, AND/OR OTHER EQUIPMENT NECESSARY TO KEEP ALL EXCAVATION PITS AND TRENCHES AND THE ENTIRE SUBGRADE AREA SAFE UNDER ALL CIRCUMSTANCES AND AT ALL TIMES. NO EXCAVATION SHALL BE LEFT UNATTENDED WITHOUT ADEQUATE PROTECTION.
- D. ELEVATIONS SHOWN ON THE PLANS ARE SUBJECT TO SUCH REVISIONS AS MAY BE NECESSARY TO FIT FIELD CONDITIONS.
- E. EXCAVATING
 1. CUT TRENCHES SUFFICIENTLY WIDE TO ENABLE INSTALLATION AND ALLOW INSPECTION. REMOVE WATER OR MATERIALS THAT INTERFERE WITH WORK.
 2. DO NOT INTERFERE WITHIN 45 DEGREE BEARING SPLAY OF FOUNDATIONS.
 3. EXCAVATE MINIMUM 4" BELOW BOTTOM OF PIPE IF STONE GREATER THAN 1" OR BEDROCK IS ENCOUNTERED.
 4. REMOVE UNSTABLE AREAS OF SUBGRADE BELOW PIPE TO MINIMUM 24" BELOW PIPE OR TO STABLE MATERIAL. BACKFILL WITH PEA GRAVEL, LIMESTONE SCREENINGS, OR EQUIVALENT AND COMPACT TO DENSITY EQUAL TO REQUIREMENTS FOR SUBSEQUENT BACKFILL MATERIAL.
 5. STOCKPILE EXCAVATED MATERIAL IN AREA DESIGNATED ON SITE AND REMOVE EXCESS MATERIAL NOT BEING USED FROM SITE.
- F. BEDDING AND BACKFILL:
 1. LINES PASSING UNDER FOUNDATIONS:
 - a. INSTALL WITH MINIMUM OF 1-1/2 INCH CLEARANCE TO CONCRETE AND ENSURE THERE IS NO DISTURBANCE OF BEARING SOIL.
 - b. BACKFILL WITH COMPACTED ENGINEER FILL PER GEOTECH REPORT.
 2. MECHANICALLY COMPACT BEDDING AND BACKFILL TO PREVENT SETTLEMENT. THE INITIAL COMPACTED LIFT TO NOT EXCEED 24" COMPACTED TO 95% DENSITY PER MODIFIED PROCTOR TEST (ASTM D-1557), SUBSEQUENT LIFTS UNDER PAVEMENTS, CURBS, WALLS AND STRUCTURES ARE NOT TO EXCEED 12" AND BE COMPACTED TO 95% DENSITY PER MODIFIED PROCTOR TEST. IN ALL OTHER AREAS WHERE CONSTRUCTION ABOVE THE EXCAVATION IS NOT ANTICIPATED WITHIN 2 YEARS, MECHANICALLY COMPACT BEDDING LIFTS NOT EXCEEDING 24" TO 90% DENSITY PER MODIFIED PROCTOR TEST.
 3. MAINTAIN OPTIMUM MOISTURE CONTENT OF FILL MATERIALS TO ATTAIN REQUIRED COMPACTION DENSITY.
 4. BEDDING: WHERE OVEREXCAVATED, BRING BACK TO BOTTOM OF PIPE ELEVATION WITH DRY SAND, GRAVEL OR CRUSHED STONE PASSING A #10 SIEVE.
 5. BACKFILL TO A DEPTH OF 12" OVER THE PIPE WITH SAND, CRUSHED STONE THAT PASSES A #10 SIEVE, PLACE IN WELL TAMPED MAXIMUM 6" LAYERS FOR LENGTH OF SEWER AND WIDTH OF TRENCH.
 6. BACKFILL ABOVE 12" ABOVE THE PIPE:
 - a. UNDER EXISTING AND FUTURE UTILITIES, AND BUILDINGS: GRANULAR MATERIALS, PIT RUN SAND, GRAVEL, OR CRUSHED STONE, FREE FROM LARGE STONES, ORGANIC, AND FROZEN MATERIALS.
 7. DIRECT SURFACE WATER AWAY FROM STOCKPILE SITE TO PREVENT EROSION OR DETERIORATION OF MATERIALS. REMOVE STOCKPILE, LEAVE AREA IN A CLEAN AND NEAT CONDITION. GRADE SITE TO FACE TO PREVENT REESTANDING SURFACE WATER.

22 11 00 WATER PIPING AND VALVES

- A. PIPING
 1. SEE PIPING SCHEDULES ON PLANS FOR ADDITIONAL INFORMATION.
 2. WELD VERIFY PIPING SEWER ELEVATIONS AND SIZES BEFORE BEGINNING BUILDING DRAIN AND MAINS. THE OWNER'S REPRESENTATIVE IN WRITING OF ANY VARIATION OF THESE ELEVATIONS BEFORE BEGINNING ANY SEWER AND BUILDING DRAIN WORK.
 3. DRAWINGS AND DIAGRAMS SHOW SIZE AND APPROXIMATE LOCATION OF PIPING. THE DRAWINGS SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. PROVIDE ADDITIONAL OFFSETS TO COORDINATE WITH INSTALLATION REQUIREMENTS OF OTHER SYSTEMS.
 4. ROUTE ABOVE GROUND PIPING IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE. OFFSET PIPE CONNECTIONS AT EQUIPMENT TO ALLOW FOR SERVICE, SUCH AS REMOVAL OF THE EQUIPMENT.
 5. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 6. INSTALL PIPING TO CONSERVE BUILDING SPACE AND NOT INTERFERE WITH USE OF SPACE AND OTHER WORK. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
 7. PROVIDE CLEARANCE FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
 8. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES.
 9. PIPING INSTALLED IN EXTERIOR WALLS SHALL BE INSTALLED ON THE ROOM SIDE OF EXTERIOR WALL INSULATION AND ONLY WHEN APPROVED BY THE ENGINEER. WHEREVER POSSIBLE, AVOID ROUTING DOMESTIC WATER SUPPLY PIPING IN EXTERIOR WALLS.
 10. DO NOT ROUTE PIPING ABOVE TRANSFORMERS, PANELBOARDS, MOTOR CONTROL CENTERS, SWITCHBOARDS OR OTHER ELECTRICAL DISTRIBUTION EQUIPMENT.
 11. PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINTING DISSIMILAR METALS.
 12. USE ONLY NEW MATERIAL, FREE OF DEFECTS, RUST AND SCALE, AND MEETING THE LATEST REVISION OF THE ASTM SPECIFICATIONS.
 13. PREPARE EXPOSED UNFINISHED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES, READY FOR FINISH PAINTING.
 14. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS. USE TOP CONNECTIONS FOR TAKEOFFS TO EQUIPMENT ABOVE THE MAINS AND BOTTOM CONNECTIONS FOR TAKEOFFS TO EQUIPMENT BELOW THE MAINS.
 15. DO NOT SUPPORT WEIGHT OF PIPING ON VALVE.
 16. MAINTAIN SEPARATION OF WATER MAIN FROM SEWER PIPING IN ACCORDANCE WITH REQUIRED CODES AND REGULATIONS.
- B. PIPING TESTING
 1. EACH TEST MUST BE WITNESSED BY THE OWNER'S REPRESENTATIVE. IF LEAKS ARE FOUND, REPAIR THE AREA WITH NEW MATERIALS AND REPEAT THE TEST. DO NOT INSULATE PIPE UNTIL IT HAS BEEN SUCCESSFULLY TESTED.
 2. MEASURE AND RECORD TEST PRESSURE AT THE HIGH POINT IN THE SYSTEM.
 3. TEST WATER DISTRIBUTION SYSTEM WITH POTABLE WATER UNDER A WATER PRESSURE OF 100 PSIG OR THE WORKING PRESSURE OF THE SYSTEM (WHICHEVER IS GREATER) FOR A PERIOD OF (4) HOURS. IF LOCAL AUTHORITIES REQUIRE MORE STRINGENT TESTING, CONTRACTOR SHALL COMPLY WITH THOSE REQUIREMENTS.
 4. WHERE NEW PIPING IS AN EXTENSION OF THE EXISTING SYSTEM, TEST THE NEW PIPING PRIOR TO CONNECTION TO THE EXISTING SYSTEM.
- C. WATER PIPING BALANCING
 1. VERIFY THAT SUFFICIENT WATER FLOW, PRESSURE AND TEMPERATURE ARE AVAILABLE AT EACH OUTLET AND EQUIPMENT CONNECTION.
 2. BALANCE CIRCULATING HOT WATER SYSTEM TO ENSURE PROPER CIRCULATION OF HOT WATER IN THE SYSTEM WITH HOT WATER AVAILABLE TO ALL FIXTURES AND CONNECTIONS.
- D. FLUSH AND DISINFECT DOMESTIC WATER SUPPLY SYSTEM AS FOLLOWS:
 1. FILL PIPING WITH POTABLE WATER AND ALLOW TO STAND FOR 24 HOURS.
 2. FLUSH EACH OUTLET BEGINNING WITH OUTLET CLOSEST TO BUILDING CONTROL VALVE AND THEN EACH SUCCESSIVE OUTLET IN THE SYSTEM.
 3. FLUSH EACH OUTLET MINIMUM 1 MINUTE AND UNTIL WATER APPEARS CLEAR AT THE OUTLET.
 4. FILL SYSTEM WITH WATER/CHLORINE SOLUTION OF 50 PPM OF CHLORINE AND LET STAND FOR 24 HOURS, OR 200 PPM FOR 3 HOURS.
 5. FLUSH WITH POTABLE WATER.
 6. REPEAT DISINFECTION IF BACTERIOLOGICAL CONTAMINATION EXISTS.
 7. PERFORM WATER LAPSEAL TEST IF REQUIRED BY LOCAL AUTHORITIES.
 8. IF LOCAL AUTHORITIES REQUIRE MORE STRINGENT FLUSHING AND DISINFECTION, CONTRACTOR SHALL COMPLY WITH THOSE REQUIREMENTS.
- E. VALVES
 1. MANUFACTURERS: NIBCO, APOLLO, KEYSTONE, CENTERLINE, DEZURIK, CRANE, MUELLER, POWELL, VIEGA, GRINNELL. LISTING OF MODEL NUMBER DOES NOT PRECLUDE OTHER ACCEPTABLE MANUFACTURERS FROM PROVIDING EQUIVALENT VALVES.

LEGEND

NOTE: ALL SYMBOLS SHOWN MAY NOT APPEAR ON DRAWINGS.

SYM.	ABBR.	IDENTIFICATION	SYM.	ABBR.	IDENTIFICATION
----	CW	COLD WATER PIPING			THERMOMETER
----	HW	HOT WATER PIPING			PRESSURE GAUGE
----	HWR	HOT WATER RETURN PIPING		HB	HOSE BIBB
----	NP	NON-POTABLE WATER PIPING		RD	ROOF DRAIN
----	SOFT	SOFT WATER PIPING		OF	OVERFLOW DRAIN
----	SA	SANITARY SEWER PIPING		FD	FLOOR DRAIN
----	ST	STORM PIPING		SD	SITE DRAIN
----	OF	OVERFLOW CONDUCTOR PIPING		HD	HUB DRAIN
----	V	VENT PIPING			FIXTURE UNIT (WATER SUPPLY OR WASTE)
----	VTR	VENT THRU ROOF		IE	INVERT ELEVATION
----	G	GAS PIPING		EL	ELEVATION
----	A	AIR PIPING		RI	ROUGH IN
----	V	VACUUM PIPING			REMOVE EXISTING
		CLEAN OUT		AFF	ABOVE FINISHED FLOOR
	WCO	WALL CLEAN OUT		HC	HEATING CONTRACTOR
	FCO	FLOOR CLEAN OUT (FLUSH)		EC	ELECTRICAL CONTRACTOR
	BFP	BACKFLOW PREVENTER		FPC	FIRE PROTECTION CONTRACTOR
		PRESSURE REDUCING VALVE		GC	GENERAL CONTRACTOR
		SHUTOFF VALVE		PC	PLUMBING CONTRACTOR
		BALANCE VALVE		NIC	NOT IN CONTRACT
		CHECK VALVE		BJ	BETWEEN JOISTS
	WHA	WATER HAMMER ARRESTOR		TJ	THRU JOISTS
		TEST CONNECTION		TTS	TIGHT TO STRUCTURE
		PIPING CAP		TYP.	TYPICAL
		UNION			

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PROJECT INFORMATION

PROJECT NUMBER **1823380**

TENANT BUILD-OUT FOR:
ASPEN DENTAL
4011 WARDS ROAD • LYNCHBURG, VA 24502

PROFESSIONAL SEAL

SHEET DATES

ISSUE DATE **MAY 31, 2018**

REVISIONS

SHEET INFORMATION

LEGEND & SPECIFICATIONS

SHEET NUMBER

P0.1