CONTINUED FROM SHEET P701

1.6 QUALITY ASSURANCE

A. QUALIFICATIONS:
1. INSTALLATION SUBCONTRACTOR: CERTIFIED BY THE STATE IN WHICH THE WORK IS PERFORMED
2. FABRICATION AND INSTALLATION PERSONNEL:
a. TRAINED AND EXPERIENCED TO THE FABRICATION AND INSTALLATION OF THE MATERIALS AND EQUIPMENT.

B. SYSTEMS INSTALLATION AND COMPONENTS SHALL COMPLY WITH:
1. NFPA 13
2. NFPA 72
C. SYSTEM TESTING SHALL COMPLY WITH NFPA 25.
D. COMPLY WITH REQUIREMENTS OF THE FOLLOWING AGENCIES:
1. OWNER'S INSURER.
2. STATE FIRE MARSHAL
3. LOCAL AUTHORITIES HAVING JURISDICTION.
E. AGENCY APPROVALS: ALL COMPONENTS CRITICAL TO OPERATION OR OTHERWISE REQUIRED BY NFPA OR THE OWNER'S INSURER SHALL BE DOCUMENTED FOR COMPLIANCE WITH THE FOLLOWING:
1. UNDERWRITER LABORATORIES LISTED.
2. FACTORY MUTUAL APPROVED
1.7 DELIVERY, STORAGE AND HANDLING
A. DELIVER MATERIALS IN ORIGINAL, UNBROKEN, BRAND-MARKED CONTAINERS OR WRAPPING AS APPLICABLE.
B. HANDLE AND STORE MATERIALS IN A MANNER WHICH WILL PREVENT DETERIORATION OR DAMAGE, CONTAMINATION WITH FOREIGN MATTER. EACH END OF PIPE SHALL BE CAPPED, PLUGGED OR TAPED, OR DAMAGE BY WEATHER OR ELEMENTS, AND IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
C. REJECT DAMAGED, DETERIORATED OR CONTAMINATED MATERIAL AND IMMEDIATELY REMOVE FROM THE SITE. REPLACE REJECTED MATERIALS WITH NEW MATERIALS AT NO ADDITIONAL COST TO OWNER.
1.9 SEQUENCING AND SCHEDULING
A. CONTRACTOR'S ATTENTION IS CALLED TO ELECTRICAL, WATER AND DRAIN PIPING, AND ELECTRICAL SYSTEMS, CONSTRUCTION AND/OR ERECTION TO BE COORDINATED WITH THE INSTALLATION OF THE SYSTEMS WHERE SAME MAY CROSS EACH OTHER, DETERMINE WHICH TRADE SHALL START WORK FIRST ON PROJECT.
1.10 EXTRA MATERIALS
A. FURNISH EXTRA MATERIALS DESCRIBED BELOW THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.
1. SPRINKLER CABINETS:
a. FINISHED, WALL MOUNTED, STEEL CABINET WITH HINGED COVER, WITH A MINIMUM OF 6 SPARE SPRINKLERS PLUS SPRINKLER WRENCH.
b. INCLUDE NUMBER OF SPRINKLERS REQUIRED BY NFPA 13 AND SPRINKLER WRENCH.

PART 2 - PRODUCTS

2.1 PIPE, FITTINGS, AND HANGERS

A. UNDERGROUND PIPE AND FITTINGS:
1. DUCTILE IRON PIPE, ANSI/AWWA C151/A21.51 AND A21.51.
a. WALL THICKNESS: CLASS 52, EXCEPT AS INDICATED OTHERWISE.
b. CEMENT MORTAR LINING: ANSI A21.4.
2. JOINTS:
a. ANSI A21.11.
3. U.S. FOR PLEX RESTRAINED OR EQUAL.
4. MAIN LINE FITTINGS:
a. SHORT SLEEVED, ANSI A21.10, RESTRAINED JOINT WITH CEMENT MORTAR LINING:
b. MECHANICAL JOINTS: ANSI A11.11.
c. FLANGED: ANSI B16.1, CLASS 250 RB.

B. ABOVE GROUND PIPE AND FITTINGS:
1. PIPE:
a. STEEL, PIPE IN ACCORDANCE WITH ASTM A135, OR ASTM A53
1) WELDED, SCHEDULE 40:
a) 1-1/4 INCHES AND SMALLER: SCHEDULE 40.
b) SCHEDULE 30 FOR SIZES LESS THAN 8 INCHES.
c) SCHEDULE 20 FOR SIZES 8 INCHES OR LARGER.
b. LIGHTWEIGHT PIPE UP TO 300 PSI FOR WELDED OR ROLL GROOVED:
• MINIMUM SCHEDULE #10 UP TO 3 INCHES.
• 0.134 SMALL THICKNESS FOR 4 INCHES.
• 0.188 SMALL THICKNESS FOR 6 INCHES AND 10 INCHES.
c. #22 OR GALVANIZED STEEL PIPE IS ACCEPTABLE ON ALL DRY SYSTEMS AND PRE-ACTION SYSTEMS.
d. COPPER TUBE IN ACCORDANCE WITH ASTM B75 OR B88.
2. FITTINGS:
a. STANDARD WEIGHT STEEL, BUTT WELD TYPE CONFORMING TO ANSI B16.9 AND ASTM A234.
b. SCREWED FITTINGS:
• PERMITTED IN NFPA 13D/13 2 INCHES AND SMALLER.
• CONFORMING TO ANSI B16.3 OR B16.4, 150 APPLICABLE, AND ASTM A197.
c. EXTRA HEAVY PATTERN (REQUIRED WHEN PRESSURES EXCEED 175 PSI):
1) CAST IRON: CAST IRON FITTINGS 2 INCHES AND SMALLER ARE ACCEPTABLE IF PRESSURES DO NOT EXCEED 300 PSI.
2) STANDARD WEIGHT MALLEABLE IRON FITTINGS 8 INCHES AND SMALLER ARE ACCEPTABLE IF PRESSURES DO NOT EXCEED 300 PSI.

C. FLEXIBLE CONNECTIONS: NOT ALLOWED.

D. HANGERS AND SUPPORTS: COMPLY WITH REQUIREMENTS OF DIVISION 21 SECTION "HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT" FOR SELECTION OF PIPE HANGERS AND SUPPORTS.

E. BRACING - SCHEDULE #1 AND TYPE K AND L COPPER:
1. 2 INCHES AND SMALLER PIPE: RECOMMENDED SIZING OF 4 PIPE DIAMETERS.
2. 2-1/2 INCHES AND LARGER PIPE REQUIRES SIZING OF 6 PIPE DIAMETERS.

F. RETURN BENDS:
1. NOT SUBJECT TO HIGH AIR ARE REQUIRED ON ALL NON-POTABLE WATER SYSTEMS.
2. RETURN BENDS ARE NOT REQUIRED ON GROUND AND DRY PENDANT SPRINKLER SYSTEMS.

2.2 SPRINKLER SPECIALTY FITTINGS

A. FITTINGS:
1. UL LISTED ON FM APPROVED, WITH 175 PSIG MINIMUM WORKING PRESSURE RATING, AND MADE OF MATERIALS COMPATIBLE WITH PIPING.
2. FITTINGS SHALL HAVE 300 PSIG MINIMUM WORKING PRESSURE RATING IF FITTINGS ARE COMPONENTS OF HIGH PRESSURE PIPING SYSTEM.

B. SPRINKLER DRAIN AND ALARM TEST FITTING: CAST OR DUCTILE IRON BODY WITH THREADED OR LOCKING LUG INLET AND OUTLET TEST VALVE, AND ORIFICE AND BRASS OR GLASS MANUFACTURERS:
1. FIRE-END AND CRICKET CORPORATION
2. TYCO FIRE PRODUCTS.
3. VIKING CORPORATION
4. VICTAULIC COMPANY OF AMERICA.

C. SPRINKLER PENDANT-USE TEST FITTINGS: BRASS BODY WITH THREADED INLET, CAPPED DRAIN OUTLET, AND THREADED OUTLET FOR SPRINKLER MANUFACTURERS:
1. ELKHART BRASS MANUFACTURING COMPANY, INC.
2. FIRE-END AND CRICKET CORPORATION
3. POTTER-ROEMER, FIRE-PROTECTION DIVISION.

D. SPRINKLER INSPECTOR'S TEST FITTING: CAST OR DUCTILE-IRON HOUSING WITH THREADED INLET AND DRAIN OUTLET AND SIGHT GLASS MANUFACTURERS:
1. ASF MANUFACTURING COMPANY.
2. TRIPLE R SPECIALTY OF AJAX, INC.
3. TYCO FIRE PRODUCTS.

2.3 SPRINKLER HEADS

A. UL LISTED WITH 175 PSIG MINIMUM PRESSURE RATING.

B. MANUFACTURERS:
1. TYCO
2. RELIABLE CORPORATION
3. TYCO.

C. INSTALLING, SIZE, TEMPERATURE RATING OF TEMPERATURE ACTIVATING COLOR CODED GLASS BULBS OR FUSED VAN PLATES IN ACCORDANCE NFPA 13 OR AS DICTATED BY AUTHORITY HAVING JURISDICTION.

D. MOUNTING AND FINISH:
1. IN AREAS WITH SUSPENDED CEILINGS: PROVIDE CONCEALED TYPE SPRINKLERS WITH COVER PLATE FACTORY-FINISHED IN OFF-WHITE BAKED ENAMEL, OR FLAT BLACK ENAMEL IN AREA WITH BLACK CEILINGS.
2. IN EXPOSED AREAS: PROVIDE CONCEALED TYPE SPRINKLERS WITH COVER PLATE FACTORY-FINISHED IN OFF-WHITE BAKED ENAMEL, PROVIDE SEMI-RECESSED TYPE SPRINKLERS IN ALL OTHER SUSPENDED CEILING AREAS
3. IN AREAS WITHOUT SUSPENDED CEILINGS: HEADS SHALL BE BRONZE FINISH, OR ROUGH TYPE
4. BRONZED FINISH PENDENT-HEADS MAY BE USED IN STORAGE ROOMS AND JANITOR'S CLOSETS
5. PROVIDE AND INSTALL SPRINKLER GUARDS WHEN SPRINKLER SUBJECT TO MECHANICAL INJURY OR WHEN CEILING IS AT 7'-0" OR LESS TO FINISHED FLOOR.
6. SIDEWALL CHROME PLATED SPRINKLERS FOR SIDEWOOD COVERAGE OR AS REQUIRED. RECESSED WALL-MOUNTED SIDEWALL SPRINKLER TO PREVENT MOISTURE.
7. DRY SPRINKLERS HEADS SHALL BE USED ON ANY PART OF A WET SYSTEM SUBJECT TO FREEZING.

2.4 VALVES

A. UL LISTED OR AN APPROVED WITH A 175 PSIG MINIMUM PRESSURE RATING

B. INTERIOR VALVES:
1. MANUFACTURERS:
a. GRINNELL.
b. CRANE.
c. MIRCO
d. MILWAUKEE.
2. 2 INCHES AND SMALLER: CAST IRON, FLANGED, RISING GATE, OR BUTTERFLY VALVES.
3. 2 INCHES AND SMALLER: BRONZE GATE VALVES.
4. UL 262.

C. SPECIAL CONTROL VALVE(S):
1. MANUFACTURER: EAST JORDAN IRON WORKS BOXES ARE OPTIONAL.
2. GATE VALVE WITH NON-RISING STEM, MECHANICAL JOINT 1 END AND FLANGED JOINT OPPOSITE END.
3. PROVIDE THREE-SECTION CAST IRON ADJUSTABLE VALVE BOX AND COVER AT GRADE.

PART 3 - EXECUTION

3.1 PREPARATION

A. SYSTEM LAYOUT:
1. THE EXTENT OF SPRINKLER SYSTEMS AND GENERAL ARRANGEMENTS OF OVERHEAD PIPING AND UNDERGROUND PIPING SHALL BE AS INDICATED ON APPROVED SHOP DRAWINGS.
2. DRAWINGS THAT SHOW SIZE AND BASIC ARRANGEMENT OF PIPING SYSTEMS HAVE BEEN PREPARED ON THE BASIS OF ACCEPTABLE PIPING MATERIALS AND METHODS. THEY ARE NOT INTENDED TO SHOW EVERY OFFSET AND FITTING REQUIRED FOR THE ACTUAL INSTALLATION. CONTRACTOR SHALL INVESTIGATE THE STRUCTURE AND THE WORK OF OTHER TRADES AND ADAPT THE WORK TO AVOID INTERFERENCES.
3. PROVIDE ADDITIONAL HEADS AS MAY BE REQUIRED FOR AN APPROVED SYSTEM.
4. DISTANCE FROM SPRINKLER TO WALL SHALL NOT EXCEED 1/2 OF THE ALLOWABLE DISTANCE BETWEEN SPRINKLERS.
5. SMALL ROOM RULE: SMALL ROOM RULE MAY BE EXERCISED WHEN OCCUPANCY HAZARD HAS BEEN DETERMINED AS LIGHT HAZARD, PROVIDED CONSTRUCTION EXISTS AND THE ROOM DOES NOT EXCEED 800 SQUARE FEET IN AREA.
6. SHAFTS:
a. INSTALL 1 SPRINKLER AT THE TOP OF THE SHAFT FOR NONCOMBUSTIBLE CONSTRUCTION AND FOR ELECTRICAL SHAFT OR PIPE SHAFT.
1) IF COMBUSTIBLE CONSTRUCTION, INSTALL SPRINKLERS AT ALTERNATE FLOOR LEVELS.
2) IF ACCESSIBLE AND NONCOMBUSTIBLE, INSTALL SPRINKLERS AT ALTERNATE FLOOR LEVELS.
b. ELEVATOR SHAFTS: REQUIRE SPRINKLERS AT THE TOP OF THE SHAFT AND AT THE BOTTOM OF THE CAR ENCLOSURE WHERE THE CAR ENCLOSURE IS NOT NONCOMBUSTIBLE OR WHERE THE CAR ENCLOSURE HAS A MANHOLE IN THE TOP. SPRINKLER SYSTEM MUST HAVE A SEPARATE VALVE FOR ELEVATOR SHAFT. SPRINKLER SYSTEM MUST HAVE A SEPARATE VALVE (CANNOT BE IN A LOCKED ROOM) THAT IS ELECTRICALLY SUPERVISED.
7. STAIRWAYS: SPRINKLER SHALL BE LOCATED BENEATH STAIRWAYS WHERE STAIRWAYS ARE CONSTRUCTED OF COMBUSTIBLE MATERIALS.
a. IF NONCOMBUSTIBLE SHAFT PROVIDES SPRINKLERS AT THE TOP.
b. IF LANDING IS SEPARATED OR MORE SEPARATED FROM STAIRWAY BY DRAWN, LOOSE-LAID NONCOMBUSTIBLE MATERIALS, AS NFPA LANDING WAS REMOVED AT EACH FLOOR.
8. BUILDING SERVICE CHUTE: SPRINKLER AT THE TOP AND AT ALTERNATE FLOORS. WHERE CHUTE TOP TERMINATES ABOVE LOWEST SPRINKLE OPENING AND ABOVE ADJACENT ROOF, SPRINKLER SHALL BE INSTALLED.
9. SPRINKLERS IN ROOMS:
a. DRY SPRINKLERS IN UNHEATED SPACES.
b. NO SPRINKLERS IN ELECTRICAL ROOMS.
10. DAYLIGHT: SPRINKLERS AT 30 INCHES ON CENTERING COVERING LOCATED AT BASE OF SKYLIGHT.

B. COMPLY WITH REQUIREMENTS OF DIVISION 01 SECTION "EXECUTION."
1. REVIEW EQUIPMENT AND MATERIALS FOR CONFORMITY TO DRAWINGS AND SPECIFICATIONS.
2. DO NOT PROCEED WITH INSTALLATION UNTIL A SATISFACTORY RESOLUTION IS FOUND.
3. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR MADE NECESSARY BY SUCH DIFFERENCES DUE TO CONTRACTORS NEGLIGENCE. IF SUCH DIFFERENCES EXIST, THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING PERFORMED ESTABLISHED THE ELEVATIONS OF ALL NEW OR EXISTING PIPING.
4. IT IS THE RESPONSIBILITY OF EACH CONTRACTOR OF ANY PARTS OF THE SYSTEM REQUIRING ADDITIONAL ACCESS AND FACILITIES TO PROVIDE ACCESS OR TO PROTECT FROM FREEZING OR DAMAGE.

3.2 INSTALLATION

A. SPRINKLER HEADS:
1. LOCATIONS:
a. LOCATE SPRINKLER HEADS IN SUSPENDED CEILING SYSTEMS WITH LIGHTS, DIFFUSERS, AND CEILING TILE LAYOUT. CONSIDER PIPING IN CEILING SPACE
b. HEAD LOCATIONS MUST BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION
c. IDENTIFY TO CONTRACTOR ANY HEADS THAT MAY BECOME SUBJECT TO FREEZING OR DAMAGE.
2. MINIMUM CLEARANCE FOR SPRINKLER HEADS:
a. CORROSION-RESISTANT COATINGS SHALL BE APPLIED ONLY BY THE MANUFACTURER OF THE SPRINKLER.
• EXCEPTION: ALL DAMAGE TO THE PROTECTIVE COATING OCCURRING AT THE TIME OF INSTALLATION SHALL BE REPAIRED AT ONCE USING ONLY THE COATING OF THE MANUFACTURER OF THE SPRINKLER IN KNAPSACK BOTTLE OR AEROSOL CAN. ANY HEAD SO THAT HAS PART OF THE SPRINKLER WILL BE EXPOSED AFTER INSTALLATION HAS BEEN COMPLETED.
b. NON-CORROSIVE ENVIRONMENTS:
• UNLESS ARTIFICIALLY DAMAGED BY MANUFACTURER, SPRINKLERS SHALL NOT BE PAINTED. AND ALL SPRINKLERS THAT HAVE BEEN PAINTED SHALL BE REPLACED WITH NEW LISTED SPRINKLERS.
• PROVIDE ESCALATION AND BACKFILLING REQUIRED IN CONNECTION WITH THE WORK OF DIVISION 22.
• PROVIDE MISCELLANEOUS STRUCTURAL STEEL REQUIRED IN CONNECTION WITH SUPPORT OF THE WORK OF DIVISION 22.
• PERFORM FINAL CLEANING OF PLUMBING SYSTEMS AND EQUIPMENT.

1.3 REFERENCES

A. EXCEPT AS HEREIN SPECIFIED OR AS INDICATED ON THE DRAWINGS, THE WORK OF THIS SECTION SHALL COMPLY WITH THE FOLLOWING:
1. 2015 INTERNATIONAL PLUMBING CODE
2. 2015 INTERNATIONAL BUILDING CODE
3. ANSI A13.1 - STANDARD FOR THE IDENTIFICATION OF PIPING SYSTEMS.
4. ASME - AMERICAN SOCIETY OF MECHANICAL ENGINEERS: B31.9 - BUILDING SERVICES PIPING.
5. ASTM: A235 - STRUCTURAL BOLTS, STEEL, HEAT TREATED, 120/105 KSI MINIMUM TENSILE STRENGTH.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

A. COORDINATION DRAWINGS, COMPONENTS, ACCESSORIES, SIZES AND MODEL NUMBERS INDICATED ON THE DRAWINGS OR IN THESE SPECIFICATIONS ARE USED TO INDICATE MINIMUM LEVELS OF QUALITY AND COORDINATION REQUIREMENTS.

B. EQUIPMENT SUPPLIED, SHOWING ACCOMPLISH OR REJECTED FROM LIST OF ACCEPTABLE MANUFACTURERS, MUST MEET THE REQUIREMENTS LISTED IN SPECIFICATIONS OR SHOWN ON DRAWINGS, BE COMPATIBLE WITH FACILITY AND INTERFERENCE, AND MEET REQUIREMENTS FOR A FUNCTIONAL SYSTEM.

C. DRAWINGS:
1. ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED.
2. DO NOT NECESSARILY CONVEY EXACT REQUIRED VALVE, FITTING, TRAP, SPRINKLER, AND TRANSITION, CASE, OFFSET, ELBOW, TRANSITION, TURNING VANE, MOUNTING SUPPORT AND RACK REQUIREMENTS.
3. SHALL NOT BE SCALED FOR MEASUREMENT OR INSTALLATION LOCATION.
4. SHALL NOT BE USED AS SHOP DRAWINGS.

D. SCHEDULES AND MODELS, NUMBERS SHALL NOT BE USED TO:
1. SERVE AS FINAL, DEFINITIVE QUANTITY REQUIREMENTS.

E. COORDINATION DRAWINGS:
1. PREPARED IN ACCORDANCE WITH ARRANGEMENTS AND DETAILS THAT ALLOW EFFICIENT AND ACCESSIBLE INSTALLATION OF THE WORK AND COORDINATION OF THE WORK OF ALL TRADES.
2. SHOW LOCATIONS AND SIZES OF CHASES AND OPENINGS.
3. SHOW LOCATIONS AND SIZES OF SUPPORTS AND SETTINGS.
4. SHOW LOCATIONS AND SIZES OF EQUIPMENT AND ACCESS REQUIRED FOR SERVICING.
5. INDICATE CLEARANCES REQUIRED FOR MAINTENANCE AND OPERATION.
6. PROVIDE DRAWINGS FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION AND INSTALLATION.

1.5 PRODUCT UNLOADING AND HANDLING

A. UNLOAD AND HANDLE PRODUCTS TO A PREVENT DAMAGE TO THE PRODUCT. CLASSIFICATION OF WORK.

B. HANDLING: STORE EQUIPMENT AND MATERIALS SUFFICIENTLY TO PREVENT DAMAGE OR DETERIORATION. PROTECT EQUIPMENT AND MATERIALS FROM DAMAGE DUE TO HANDLING AND STORAGE INCLUDING DAMAGE FROM WEATHER. SUBJECT TO THE APPROVAL OF AN AUTHORIZED REPRESENTATIVE OF THE EQUIPMENT MANUFACTURERS WHOSE EQUIPMENT IS INSTALLED.

1.6 TRADE DIFFICULTIES

A. BY CONTRACTOR: IMMEDIATELY NOTIFY OWNER OF START-UP OR SHUTDOWN DIFFICULTIES OR MECHANICAL SYSTEMS OPERATIONAL PROBLEMS DEVELOPED DURING CONSTRUCTION PERIOD. DO NOT PROCEED WITH START-UP OR SHUTDOWN UNTIL DIRECTED BY OWNER.

B. BY ENGINEER:
1. IF CONTRACTOR REQUESTS ASSISTANCE, ENGINEER WILL PROVIDE THE SERVICES NECESSARY TO DETERMINE THE CAUSE OR CAUSES OF THE OPERATIONAL PROBLEMS.
2. UNDER THE FOLLOWING CONDITIONS, ENGINEER WILL ALSO PROVIDE THESE SERVICES IF CONTRACTOR FAILS TO CORRECT DIFFICULTIES SATISFACTORILY TO OPERATIONAL SYSTEMS WITHIN A REASONABLE TIME AFTER WRITTEN NOTICE TO THE ADDRESS:
3. IF WHERE WORK WAS DONE CONTRACTOR'S REQUEST OR UNDER THE PROVISIONS OF THE GENERAL CONDITIONS, INSPECTION OF WORK IN PART HAS DISCLOSED AND DUE TO FAILURE OF THE WORK TO COMPLY WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. OWNER WILL CONSIDER ENGINEER FOR ADDITIONAL SERVICES ASSOCIATED WITH THE AMOUNT PAID FROM PAYMENT ON PAYMENTS TO CONTRACTOR.

1.7 MAINTENANCE

A. SPECIAL TOOLS: WHERE SPECIAL TOOLS ARE REQUIRED FOR OPERATION, FURNISH THESE TO OWNER.

B. STORAGE AND DETACHMENT PARTS:
1. RETAIN STORAGE AND SMALL DETACHABLE PARTS OF THE APPARATUS AND EQUIPMENT FURNISHED UNTIL THE COMPLETION OF THE WORK.
2. TURN OVER THESE PARTS TO OWNER.

C. CONSTRUCTION STRAINERS:
1. REMOVE AFTER FLUSHING AND CLEANING AND PRIOR TO TURN OVER TO OWNER.
2. ATTACH PROPOSED CONSTRUCTION STRAINERS TO PIPING WHERE REMOVED AS PROOF OF REMOVAL.

PART 2 - PRODUCTS

2.1 FABRICATIONS

A. MATERIAL INSTALLED IN A CEILING PLENUM SHALL BE EITHER NON COMBUSTIBLE OR HAVE A MAXIMUM FLAME SPREAD OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50.

PART 3 - EXECUTION

3.1 INSTALLATION

A. CHARACTER OF WORK: INSTALLATION SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL PRESENT A NEAT AND ORDERLY APPEARANCE WHEN COMPLETED.

B. LAYING OUT OF WORK:
1. LAYOUT PIPING, EQUIPMENT AND COMPONENTS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE MANUFACTURER'S RECOMMENDED PRACTICE, INCLUDING PROVISION OF ADEQUATE SPACE FOR MAINTENANCE. REVIEW LAYOUT WITH ENGINEER PRIOR TO INSTALLATION.
2. LOCATE PIPING AS CLOSELY TO BUILDING CONSTRUCTION AS POSSIBLE, WITH THE BUILDING AND LEVEL, EXCEPT FOR DRAIN SLOPE.
3. DO NOT CUT OR DRILL HOLES IN STRUCTURAL MEMBERS WITHOUT THE WRITTEN PERMISSION OF THE STRUCTURAL ENGINEER.
4. PROVIDE ALL NECESSARY OFFSETS AND FITTINGS TO AVOID OBSTRUCTIONS.
5. INSTALL PIPING TO PERMIT VALVE SERVICING.
6. INSTALL PIPING FREE OF SAGS AND BENDS.
7. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
8. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPING OR ADJOINING SUPPORTS.
9. INSTALL PIPING TO ALLOW APPLICATION OF INSULATION.
10. POSITION VALVES FOR ACCESS.
11. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED.
12. INSTALL PIPING IN ACCESSIBLE LOCATIONS WHERE POSSIBLE.
13. INSTALL PIPING PARALLEL WITH BUILDING AND LEVEL, EXCEPT FOR DRAIN SLOPE.
14. INSTALL PIPING TO CONSERVE BUILDING SPACE AND INTERFERENCE WITH USE OF SPACE.
15. GROUP PIPING WHENEVER POSSIBLE.
16. INSTALL PIPING TO ALLOW FOR SERVICING OF EQUIPMENT.
17. INSTALL PIPING TO ALLOW FOR REMOVAL OF EQUIPMENT.
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3.3 CLEANING AND FINISHING

A. COMPLY WITH THE REQUIREMENTS OF DIVISION 01 SECTION "DEMOLITION."

B. EXCEPT INSTALLATION SHALL BE FREE FROM SURFACE OIL AND GREASE BEFORE WORK WILL BE CONSIDERED FOR FINAL PAYMENT.

C. AFTER TESTS HAVE BEEN MADE AND THE SYSTEM PRONOUNCED TIGHT:
1. CLEAN PIPING AND EQUIPMENT

D. LUBRICATE BEARINGS.

E. PIPE RUNS SHALL BE FUTURE PARALLEL WITH THE BUILDING AND LEVEL, EXCEPT FOR DRAIN SLOPE.

F. DRAIN SLOPE SHALL BE A MINIMUM OF 1 INCH IN 25 FEET AND SHALL BE IN THE DIRECTION OF FLOW WHERE POSSIBLE.

G. PLASTIC PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND AS INSTALLED UNDERGROUND, OR IN AN ENCLOSED SPACE WITH APPROVED FIRE RATED BARRIER.

3.3 PIPE JOINTS

A. SOLVENT CEMENTING:
1. PLASTIC PIPE TO BE CUT SQUARE TO ALLOW TRUCKING TO BOTTOM CUT IN THE SOCKET OF THE FITTING.
2. THE PIPE END TO BE CHAMFERED AROUND THE OUTSIDE, AND DEBURRED ON THE INSIDE TO ALLOW FOR PROPER FIT.
3. THE PLASTIC PIPING AND INSIDE OF FITTING TO BE CLEANED WITH AN APPROVED PIPE CLEANER TO ENSURE PROPER BONDING OF SOLVENT CEMENT.
4. THE JOINTING SURFACE MUST BE DISSOLVED AND MADE SEMI-FLUID WITH SUFFICIENT SOLVENT CEMENT BEING APPLIED TO BOTH SURFACES TO FILL THE GAP BETWEEN PIPE AND FITTING.
5. THERE SHALL NOT BE A RIDGE OF CEMENT ARCHED THE INSIDE OF PIPE OR FITTING.

B. JOINTS BETWEEN PLASTIC PIPE AND COPPER, STEEL OR CAST IRON PIPING TO BE MADE WITH LOCAL AND STATE CODE APPROVED ADAPTERS.

C. APPROVED POLYETHYLENE FERRULES AND SLIP NUT JOINTS MAY BE USED FOR PIPE 2-INCH OR LESS DIAMETER ON PIPING OR EQUIPMENT OR PUMPS/TANK CABINET BASES.

D. SCHEDULE 80 PIPE SHALL BE THREADED WITH SPECIAL PIPE SIZE FOR MATING WITH SCHEDULE 80 THREADED FITTINGS.

E. USE ONLY SCHEDULE 80 FLANGES TO BE JOINTED BY EITHER SOLVENT CEMENT OR TH