Section 21 00 00 – Fire Suppression (Maintenance; Common Work Results; Schedules; Insulation; Instrumentation & Control)

1. See also Section 08 30 00 – Specialty Doors & Frames.
2. See also Section 09 50 00 – Ceilings.
3. See also Section 09 90 00 – Painting & Coating.
4. See also Division 33 for Utility Standards.
5. Fire Suppression system design requires review and approval by EH&S.
6. NO demolition of one item shall occur in order to repair and/or replace another item.
7. ALL deleted items **must** be removed and not just abandoned.
8. Systems and system components in new construction, remodels, and retrofits are to be compatible with existing systems and system components to the extent possible
9. New building projects must be 100% sprinkler protected.
10. ALL/ANY item that requires special tools and/or test equipment must be brought to the attention of the pertinent Owner's FS personnel prior to specification and/or installation.
11. Accessibility of Fire Suppression Equipment:
    a. Refer to and abide by all OSHA requirements, as appropriate.
    b. Per the 'Design Review Requirements' at the beginning of this document, a drawing layer of 'Maintenance Access' is to be incorporated into ALL drawings and system designs. This layer MUST be maintained through all phases of design and construction.
    c. Access to standpipe and riser rooms must be via a corridor or mechanical room only.
    d. All necessary access points for maintenance must be provided and coordinated. Minimum of 12" clearance at access points are to be maintained
    e. Utility risers must be provided with a door (3ft x 7ft). Access panels are not allowed for riser access.
    f. Fire Suppression Access Panels:
        - Sprinkler valves and/or equipment shall be provided with an access panel large enough to readily pass equipment/manpower through to make repairs.
        - Panel location is subject to review by the Architect, Engineer, and FS EH&S.
        - Panel shall be rated the same as wall or ceiling in which it is located.
        - Labeling of what component(s) is behind an access panel. Red label with 1" white lettering.
        - Doors less than 24" shall be provided with a concealed pivoting rod hinge. Doors 24" or larger shall be provided with a continuous piano hinge. The door shall contain latch screws for securing the door.
        - Panel door shall have rounded safety corners, be fabricated from 16 gage galvanealed steel, and shall have a factory prime coat finish suitable for painting.
        - Panel frame shall be one piece construction and provide concealment of the rough wall opening without visible miters or welds on the face.
        - The wall frame shall be provided with 1/4" mounting hose for fastening with the furred space.
        - Manufacturers: ELMDOOR Manufacturing Co.; or approved.
    g. Inaccessible Equipment:
        - If after meetings, reviews, comments, etc., there are documented and/or discussed changes not incorporated into the construction documents and installed equipment is not accessible for operation and maintenance, equipment shall be removed and reinstalled at no additional cost to the UO or the project. Discussions of payment will occur with the design team.

Section 21 00 00 – Fire Suppression continued

- 'Accessible' is defined as being capable of being reached without climbing or crawling under or over obstacles such as motors, pumps, belt guards, transformers, piping and ductwork. Access must not exceed 14ft in height, a typical ladder working height.

12. Minimum Identification:
    a. Hydraulic information signs required at main riser.
    b. Re-label units when labels begin to fade or fall off.
    c. During finish construction, labeling is to be reviewed and approved by FS PM and Maintenance.
    d. Provide permanent signage, interior and exterior, at all utility boxes, vaults, manholes, main valves, etc.
    e. Zoned systems must have clearly defined valves.
    f. Label equipment, piping, etc. with description or verbiage and direction of flow. No color banding.
    g. Label all valves with numbers and what they serve.
    h. Covering or painting of any sign/label requires replacement.
    i. Label piping to fire hose cabinets as such and not 'Fire'. (Existing conditions only.)
    j. Label ceilings or ceiling grid (not the tile) at key access points, valves, equipment, etc. with a clear adhesive label and bold black lettering with equipment, etc. ID information.
13. Design Criteria and Tests / Approvals of Sprinkler System:
    a. Contractor shall conduct a pretest of wet system with air pressure at 50 psi for 1 hour minimum.
    b. Hydrostatic Test: Test pipe of sprinkler systems with not less than 200 psig or 50 psi above normal static pressure for 2 hours in presence of Architect, Engineer, FS EH&S, or authorized representatives of Fire Department. No exceptions will be made
14. Training:
    a. The vendor shall provide FS EH&S training of maintenance and operational aspects, both described and demonstrated.
    b. Training shall be conducted by a manufacturer's representative thoroughly familiar with the characteristics of the installed system.
    c. A minimum of 6hrs of total training is to be provided.
15. Service: The system vendor must employ factory trained technicians and maintain a service organization within 125 miles of the project and be capable of responding to service calls within 4 hours.
16. 1-Year Warranty Inspection: Contractor to conduct a 1 year inspection with FS EH&S of system equipment and system operational functions prior to expiration of 1 year warranty and correct any found items at the cost of the Contractor. Provide report to FS PM and EH&S.
17. Overstock, tools and supplies to be included in each sprinkler head cabinet:
    a. Sprinkler heads: minimum six (6) per head type.
    b. Sprinkler head wrenches: minimum two (2) per sprinkler head cabinet plus two (2) spares to be delivered to Over Stock Room.
    c. Sprinkler head cabinet: one (1) per sprinkler riser.
18. In the Operations and Maintenance Data, provide the following information on each type of fire suppression system:
    a. Name and 24/7/365 contact information for system installer and General Contractor.
    b. Floor plans showing the layout and location of all sprinkler heads, valves, flow sensors, risers, service entry, standpipes, fire department connections, etc. for each floor.
    c. Separate floor plans graphically depicting system zoning for each floor.

Section 21 00 00 – Fire Suppression continued

d. Reduced scale copy of system zoning plans to permanently mount in riser room.
e. Parts and material specifications for specialized system components that require routine maintenance or replacement in the event of activation.

End of Section

Section 21 10 00 – Water-Based Fire Suppression Systems (Facility Water-Service Piping; Standpipes; Sprinkler Systems)

1. Systems and system component locations should be designed and located in areas that are not exposed to the weather therefore requiring additional insulation, heat tape, etc. measures.
2. All kitchen spaces / applications must reference UL 300 compliance and the City of Eugene Fire Suppression Requirements regarding kitchen hoods and ventilation. The City of Eugene is more stringent than the IFC.
3. Furnish and install tamper switches, flow switches and weatherproof exterior bell. Electrical connection to be by building monitor contractor. Coordinate connection to ensure proper function of alarm and supervisory devices.
4. Fire Suppression Piping:
   a. Interior Pipe Shall Be:
      - Steel Pipe: black steel; Schedule 40 or 10; ASTM A-53 or ASTM A-135; Type E; Grade A or B.
      - Steel pipe 1in to 2in is to be Schedule 40, or UL listed proprietary pipe similar to Allied Dyna-Thread for UL listed Threaded Corrosion Resistance Ratio (CRR) greater than or equal to 1.0.
      - Steel pipe 2-1/2" and larger is to be Schedule 40 or 10 and shall be verified to have a CRR of 1.0 or greater.

   b. Do not impede or limit access of doors, windows, openings, or head room; piping shall be configured to provide maximum amount of access for equipment maintenance.
   c. Pipe openings shall be closed with caps and/or plugged after installation to prevent entrance of foreign materials before final connection.
   d. Maintenance and Protection Requirements:
      - Flushing locations shall be provided per IBC Standard in accessible locations; reviewed and approved location by the Architect / Engineer and the Facilities EH&S.
      - Flushing Connections: 1-1/4in nipples with caps at extreme ends of all cross mains.

   e. Drains and Drips:
      - Piping shall drain back to the express drain located beside the standpipe/riser. Where this is not possible auxiliary drains must be provided and discharge location to be reviewed and approved by FS EH&S.
      - Install auxiliary drains at low points in system.
      - Five or fewer trapped heads will not require a drain valve, but may be drained through plugged tee.
      - Drains are to have a 3/4in hose line connection.
      - If discharge of main drains, auxiliary drains, or inspector's test connections will cause exterior landscape or property damage a concrete splash block is to be provided to deflect flow and minimize damage.
5. Fire Suppression Interior Joints/Fittings:
   a. Schedule 40, Black Steel Pipe Requires:
      - Screwed joints ANSI B2.1 or welded joints ANSI B31.10, B31.10a, B31.20b.

Section 21 10 00 – Water-Based Fire Suppression Systems continued

- Mechanical grooved couplings joined by an UL and FM approved combination of bolted couplings, gaskets and grooves. Grooves may be rolled or cut and be dimensionally compatible with the coupling.

b. Schedule 10, Black Steel Pipe Requires:

- Welded joints, ANSI B31.10, B31.10b
- UL and FM approved mechanical couplings. Couplings may be of the bolted rolled grooved type or the mechanical locking type. Grooves for the rolled grooved type shall be rolled only.

c. Cast Iron Screwed: ANSI B16.4.
d. Cast Iron Flanged: ANSI B16.1 or AWWA C207.
e. Fittings not allowed:

- Lock screw plain end joints/fittings.
- Snap-Let outlet.
- F.I.T. fittings.
- Gasket plain-end joints/fittings.

f. Mechanical pipe coupling housings shall be of malleable iron conforming to ASTM A 47, Grade 32510 or ductile iron conforming to ASTM A 536, Grade 65-45-12. Coupling nuts and bolts shall be of steel and conform to ASTM A 183.
g. Flange Gaskets: Gaskets shall be non-asbestos compressed material in accordance with ASME B16.21, 1/16 inch thickness, full face or self-centering flat ring type. The gaskets shall contain arimid fibers bonded with styrene butadiene rubber (SBR) or nitrile butadiene rubber (NBR).
h. Square head Bolts and Heave Hexagon Nuts: ASME B18.2.1 and ASME B18.2.2, and ASTM A 307, ASTM A 575, or ASTM A 576.
i. Saddle type mechanical tees are acceptable for tapping into existing supply mains.
j. Reductions in pipe sizes shall be made with one piece reducing fittings.
k. Provide listed and approved flexible couplings on sprinkler mains per UBC.
l. Install UL approved hangers and earthquake bracing in place of supporting sprinkler piping.
m. Provide loops or victaulic couplings where piping crosses seismic joints in construction.
n. Provide dielectric unions wherever dissimilar piping materials are connected.

6. Wall and Floor Penetrations:

a. Holes for pipe passing through rated walls shall be filled to the manufacturer's recommended thickness with fire resistant caulk.

- Wall and hard ceiling penetrations shall be fire stopped.

b. Provide escutcheons for pipe penetrations through finished areas.
c. Escutcheons shall be chromium plated iron or chromium plated brass, either one piece or spit pattern, held in place by internal spring tension or set-screw.

7. Hangers, Inserts, and Support:

a. Hangers shall be in accordance with IBC Standard 9-1.
b. Manufacturers known to be acceptable: Michigan, Tolco.
c. Hangers, brackets, supports, anchors, and related appurtenances are to be UL listed for pipe size(s) being suspended.
d. Pipe may be anchored to corridor walls using unistrut and pipe clamp.
e. Hanging of pipes from ductwork is prohibited.

8. Fire Suppression Interior Control Auxiliary/Utility Valves:

a. NO Milwaukee Butterball Ball Valves.

Section 21 10 00 – Water-Based Fire Suppression Systems continued

b. Auxiliary/Utility Valves:

- Manufacturers known to be acceptable: United Brass Works; Central; Gem; Kennedy; Victaulic.
- Location and quantity of auxiliary drain valves are to be reviewed and approved by FS EH&S.
- Globe and Angle Valve Manufacturers known to be acceptable: United Brass Works, Inc. 45S and 46S; Central F15 and F16.
- Ball Valves Manufacturers known to be acceptable: Central; United Brass Works.

9. Sprinkler Heads & Associated Equipment:

a. Appropriately rated heads in all locations; especially skylights.
b. Concealed heads are required in recreation centers, childcare centers, and any other location deemed appropriate by the FS EH&S office.
c. Quick Response Pendent Heads:

- Finish is to be white in white recessed escutcheon.
- Heads typically to be 165°F rated, K=5.6, NPT= 1/2". **Fusing element to be metal link**.
- Manufacturers known to be acceptable: Viking; Reliable; Globe; Tyco.
- Sprinklers being replaced shall be replaced with quick response heads of same temperature and orifice sizes. Original and replaced sprinkler heads shall be turned over to the FS EH&S.

d. Quick Response Upright Heads:

- Finish shall be brass.
- Heads typically to be 165°F rated, K=5.6, NPT= 1/2". **Fusing element to be metal link**.
- Manufacturers known to be acceptable: Viking; Reliable; Globe; Tyco.
- Sprinklers being replaced shall be replaced with quick response heads of same temperature and orifice sizes. Original and replaced sprinkler heads shall be turned over to the FS EH&S.

e. Quick Response Sidewall Heads:

- Finish is to be white escutcheons and white coated sprinklers.
- Heads typically to be 165°F rated, K=5.6, NPT= 1/2". **Fusing element to be metal link**.
- Manufacturers known to be acceptable: Viking; Reliable; Globe; Tyco.

f. Sprinkler Head Cabinet:

- Contractor shall furnish extra sprinklers of each type installed; no less than 4 of each type.
- Contractor shall furnish no less than two special sprinkler head wrenches or one head wrench for each sprinkler head box, whichever is greater.
- Cabinet is to be located in near main riser.
- Manufacturer: Same as sprinkler head manufacturer.

10. Fire-Stopping:

a. Provide fire-stopping composed of components that are compatible with each other, the substrates forming openings, and items penetrating the fire-stopping as demonstrated by fire-stopping manufacturer based on testing and field experience.
b. Intumescent Latex Seal Manufacturers known to be acceptable: The RectorSeal Corporation; 3M Fire Protection Products.
c. Intumescent Putty Manufacturers known to be acceptable: General Electric Co.; International Protective Coatings Corp.; 3M Fire Protection Products.

Section 21 10 00 – Water-Based Fire Suppression Systems continued

11. Joints:

    a. Shop welded joints will be permitted.
    b. Flanged joints or mechanical grooved couplings shall be provided where indicated or required by IBC Standard.
    c. Mechanical grooved pipe joints shall conform to AWWA C 606.
    d. Mechanical couplings and fittings shall be from the same manufacturer.
    e. Joints shall be in accordance with ANSI B1.20.
    f. Joints shall be made using UL-04 listed or FM-P7825 approved combination of fittings, gaskets, and grooves.
    g. Mechanical pipe couplings shall be of the bolted type and consist of a housing fabricated with a synthetic rubber gasket, nuts, and bolts to secure the unit together.
    h. Gaskets shall be of molded synthetic rubber with central cavity, pressure responsive configuration and shall conform to ASTM D 2000.

End of Section

END OF DIVISION 21