## 21 00 00 FIRE SUPPRESSION

21 00 50 Design Criteria

A. Refer to the DFCM website for the latest mechanical design requirements. USU design requirements include the DFCM design requirements.

B. Comply with the latest (Utah adopted) edition of the International Codes:
   International Building Code (IBC),
   International Mechanical Code (IMC)
   International Plumbing Code (IPC)
   International Fuel Gas Code (IFGC)
   International Energy Conservation Code (IECC)
   International Fire Code (IFC)
   National Electric Code (NEC)
   All state amendments.

C. Comply with all applicable local, state, and federal codes and regulations.

D. Design all new buildings with automatic fire protection systems throughout the building where required by code. Automatic fire suppression systems will be provided as a part of major renovation projects. Wet pipe type systems are preferred.

E. Design all systems NFPA 13 standard for the application intended.

F. Complete a water supply analysis prior to the design performed by a licensed engineer complete with verified water flows or use USU provided information. Submit the water analysis report.

G. Use 80% of the maximum flow from the water supply analysis for the system design.

H. The Fire Marshal is permitted to allow a 50% reduction in the required fire flow for all buildings that are fully sprinklered.

I. NFPA 13R systems require USU authorization prior to bid.

J. Design commercial kitchen hood systems to be listed to UL 300 and designed and installed per NFPA 96.

K. Coordinate and show locations for the following items on the bid documents: fire sprinkler riser, main drain, fire department connections, standpipe locations, and main line routing.

L. Coordinate the main drain line outlet location to eliminate water staining of hard surfaces and landscape erosion.

M. Submit all bid documents for review by the USU Fire Marshal prior to bid.

N. Submit sprinkler shop drawings including hydraulic calculations, pipe drawings and material/product cut sheets.

O. Provide complete as built drawings at the project completion.

P. Coordinate design and construction with USU Fire Marshal's website.

21 01 00 General Requirements

A. Install fire protection systems per NFPA 13, IFC, IBC, and the Utah State Fire Marshal's Laws, Rules, and Regulations.

B. Schedule all fire suppression system shutdowns 7 days in advance. Submit written request to USU project manager.

C. Refer to the USU Fire Marshall website for required inspections.

D. Provide materials and equipment that are approved, listed, and labeled by UL or FM specifically for fire protection service.

E. Fire flow requirements for proposed construction shall be based on Appendix B of the IFC.

F. Connect magnetic door holders in stair wells to the fire alarm system.

21 05 00 Common Work Results

A. Provide USA made fire suppression piping and fittings.

B. Fire suppression piping is not permitted in exterior walls.

C. Refer to Division 23 for general duty valves, hangers & support, identification & tagging, meters & gages, vibration & seismic controls, operation & maintenance manuals, and other general piping requirements.

D. Route all fire suppression piping to remain clear of transformer vaults, refrigerated spaces, switch rooms, elevator shafts, or other critical areas, and vault spaces over same.

21 08 00 Commissioning

A. Commission all fire suppression systems. Refer to project commissioning requirements.

## 21 10 00 WATER-BASED FIRE SUPPRESSION SYSTEMS

21 11 00 Fire Suppression Piping

A. Provide piping per the following:

| | | |
|---|---|---|
| Wet Systems: | All sizes | Schedule 40 black steel |
| Dry Systems: | All sizes | Schedule 40 black steel |

21 11 10 Fire Riser

A. Provide a tampered OS&Y or tampered butterfly main control valve independent of the butterfly valves on the backflow preventer where the fire main enters the building. Provide a double check valve backflow prevention device.

B. Provide a 4-inch diameter (minimum) fire riser.

C. Provide an exterior weather proof water flow strobe horn. Potter's SASH Sprinkler Alarm Strobe Horn.

D. The backflow preventer assembly must be a double check ASSE 1015 assembly (Ames Colt 200 series). Neptune water meter for Logan City.

E. The backflow preventer assembly must be tested within 10 days of initial use or upon occupancy request.

F. The backflow assembly test ports (cocks) cannot be used for gauges or any other apparatus. The ports are for testing only.

G. Provide AWWA approved pipe material from underground flange to backflow preventer assembly for drinking water (cannot be black iron pipe).

H. Provide same size pipe from flange to backflow preventer for 10x diameter in length upstream and 3x diameter downstream.

I. Provide AWWA approved for drinking water and fire systems pressure reducing valves (PRV's), if used.

21 11 11 Test Valves

A. Locate all test valves in mechanical rooms in central locations with easy access.

B. Provide a minimum number of locations for test valves. In new construction it is preferred all test valves be at one location.

C. Provide a pressure gauge at each test valve location.

D. Install a pressure gauge on the main supply of each sprinkler system, upstream from the main test valve.

E. All test valves must be piped to building exterior and into accommodating stormwater catch basin or appropriately sized sump. This is particularly important with regards to the main line valve typically located in the building basement. It may be necessary to provide an additional system drain-down line and valve for system maintenance at the lowest point.

21 11 19 Fire Department Connections

A. Size exterior fire department connections according to requirements of the local fire district.

B. Provide siamese type fire department connection located in an accessible location.

21 12 00 Standpipes

A. Design and install all standpipe systems per NFPA 14.

21 13 00 Fire Sprinkler Systems

A. Provide sprinkler systems that are monitored by the building's fire alarm panel and capable of monitoring and reporting water flow in all zones and tampering with all valves of the system. Provide a panel equipped for sounding a local alarm throughout the building.

B. Provide USA fire sprinkler piping and fittings.

C. Use nitrogen charged sprinkler pendants where possible in areas that are subject to freezing conditions.

D. Locate fire sprinkler heads in the center of lay-in center tiles.

E. Braided flexible stainless steel sprinkler piping for sprinkler heads is acceptable.

F. Use double interlock pre-action FM 200, FE 227, or other approved clean agent systems in computer rooms or other special areas.

**21 30 00 FIRE PUMPS**

A. Design and install all fire pumps per NFPA 20.

- END OF SECTION -

**Revision Log:**

| | |
|---|---|
| 07/27/10: | Fire Riser Main Control Valve Clarification, braided flexible stainless steel piping added. |
| 04/12/11: | Piping material to be all Schedule 40 black steel, no Dynathread. |
| 11/25/13: | Stair well magnetic door holders to fire alarm system, revise fire riser requirements; add exterior water flow horn strobe, fire marshal website coordination, FM 200 computer/special areas, use nitrogen charged sprinkler pendants in freezing areas. |
| 8/8/14: | Delete FM Global design requirement. |
| 9/21/22: | Changed 21 11 10 D. pertaining to backflow assemblies to ASSE 1015 from ASSE 1048. |
| 9/21/22: | 21 11 11 E. Changed main test valve to exit building into catch basin/sump. |
| 9/21/22: | 21 11 11 A. All pipe material to be schedule 40 black steel. |