DIVISION 21 – FIRE SUPPRESSION

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21 00 00. FIRE SUPPRESSION

21 00 03. GENERAL PROVISIONS

.1 PREPARATION OF CONTRACT DOCUMENTS

.1.1 PLUMBING CONTRACT: Include work related to Fire Protection within the scope of the Plumbing Contract.

.1.1.1 Specify that the contractor performing the fire protection work shall be licensed and certified by the State of Ohio and the Fire Marshal to perform work on the fire protection system.

.2 NFPA: Installation must comply with NFPA. Whenever referring to materials and installations by National Fire Protection Association Pamphlets use only the current edition and include the date of each referenced publication in the specifications.

.3 EXISTING FIRE PUMPS: In remodeling or alteration projects where an existing fire pump will be used, consult the University Architect regarding desirability to updating systems to comply with the standards stipulated herein.

.4 The Associate should note that the Columbus Campus is served by Fire departments of municipalities having jurisdiction in addition to the City of Columbus. Consult the University Architect for assistance in determining which agency will serve the project area.

21 00 05. SUBMITTALS

.1 SUBMITTALS: Require that shop drawings for systems be reviewed by State of Ohio Fire Marshal. Require that informational and/or operating manuals be provided for all fire protection equipment.

.1.1 List of required submittals shall include backflow preventers, fire pump, fire pump controller, jockey pump, piping, pipe fittings, sprinkler heads, flow switches, tamper switches, and additional and required submittals shall be listed and required.

.1.2 Specify three unique stages of design submittals for any fire suppression system, as follows:

.1.2.1 Materials and Equipment List: Include all materials, equipment and accessories required for the work. Include catalog ID numbers, drawings, cut sheets as necessary to define the work. If cut sheets include multiple selections, and or optional selections, then clearly label the included selections and the included options. Submit to the associate for review.

.1.2.2 Preliminary Shop Drawings: Include sprinkler head locations only. Include full-size detail representation of each style of sprinkler head to be used. Submit to the associate for review.

21 00 00. FIRE SUPPRESSION (Cont'd)

21 00 05. SUBMITTALS Cont'd)

.1.2.3 Detailed Shop Drawings: Include pipe layout and sizing, sprinkler head locations coordinated onto reflected ceiling drawings, hydraulic calculations, system controls, and all equipment cut sheets, zone valves, zone drain valves, and zone test stations. Submit to all required parties identified in 21 00 03.7, Authority Having Jurisdiction (AHJ), the local Fire Chief, State Fire Marshal, and the University's Insurance Underwriter, for review and approval by all.

21 00 07. TESTING

.1 TESTING OF FIRE PUMPS: Include in the specifications the requirement that the contractor and the pump manufacturer perform a demonstration test of the system in the presence of designated University personnel. Scheduling and other arrangements for the demonstration shall be made through the University Architect.

21 00 09. RELATED WORK IN GENERAL CONSTRUCTION

.1 FIRE EXTINGUISHERS AND NON-VALVED CABINETS: Specify these in Division 10 SPECIALTIES as part of the General Contract.

.2 FIRE HOSE CABINETS shall include valve, hose, fire extinguishers, and space for them. Make certain that extinguisher is specified in General Contract Division 10.

21 05 05. FIRE SUPPRESSION MATERIALS AND METHODS

21 05 25. VALVES

.1 GATE VALVES: Use UL approved O.S. & Y., 175 lb., except hose cabinet valves.

.1.1 2-1/2 in and smaller, brass or bronze body, trim and stem, solid wedge, rising stem, union bonnet, screwed or flanged ends.

.1.2 3 in. and larger, iron body, bronze trimmed, O.S. & Y., flanged ends.

.1.3 All post indicating valves located in areas subject to damage by vehicular traffic shall be protected by bollards.

21 10 00. WATER-BASED FIRE SUPPRESSION SYSTEMS

21 11 16. FACILITY FIRE HYDRANTS

.1 FIRE HYDRANTS shall be Clow-Eddy (Break-Flange Model F-2640), manufactured by the Valve Division of the Clow Corporation, Oskaloosa, Iowa 52577. Within Franklin County, provide Franklin County threads; at other locations, provide standard threads required for the fire department serving the facility.

.1.1 Hydrant features must include: 4-1/2" or 5-1/4" minimum valve opening. 5 foot bury depth. 150 psi working pressure and hydrostatic tested to 300 psi. Easy repair without special tools. Parts interchangeable with other hydrants. Rotation of standpipe without digging to enable up to 360° nozzle direction change. 4" or 6" mechanical joint, flanged, ring-tight inlet connection. Rising stem valve with square operating nut turning clockwise to open. 4" pumper nozzle. Plugged drain holes to retain water in the standpipe after use. Bronze working parts.

21 11 16. FACILITY FIRE HYDRANTS (Cont'd)

.1.2 Installation and locations of fire hydrants must conform to NFPA Pamphlet 23, OUTSIDE PROTECTION, and specifications of both The Ohio State University and governing authorities having jurisdiction. Locate one hydrant near the exterior siamese pumper connection.

.1.3 Inspection: Backfilling will not be permitted until hydrant drain holes are plugged and The Ohio State University Division of EMS and Fire Prevention has inspected the installation and found it acceptable. Note that existing water lines supplying new hydrants shall be modified by the contractor to bring water line up

21 12 00. FIRE-SUPPRESSION STANDPIPES

.1 DESIGN, INSTALLATION, AND TESTING: Comply with the Ohio Building Code, the Authority Having Jurisdiction (AHJ), the local Fire Chief, State Fire Marshal, the requirements of the NFPA Pamphlet 14, STANDARD FOR INSTALLATION OF STANDPIPE AND HOSE SYSTEMS, and the University Building Design Standards. Wherever standpipes are installed, siamese pumper connections shall be provided as required.

.1.1 At the start of design, the design associate remains responsible to perform a flow test and pressure test, to be performed by a service agency licensed and certified by the AHJ to perform such tests. Provide a copy of the flow and pressure test to the University.

.2 STANDPIPES: In buildings where standpipes are installed, the first-aid hose for occupant use shall be in a hall or corridor adjacent to a stairway enclosure. All fire department (2-1/2 in.) valve cabinets shall be in a stairwell.

21 12 20. FIRE HOSE CABINETS AND ACCESSORIES:

.1 HOSE CABINETS shall be painted steel, flanged, flush mounted type (similar to extinguisher cabinets), large enough to accommodate a fire extinguisher beside the fire hose. Each fire hose, extinguisher, and fire valve cabinet shall have a locking break-glass type door with full flat glass in the door.

.2 ORIFICES: Whenever necessary to ensure that hose pressure does not exceed 60 psig, orifices shall be required on hose cabinet valve-discharges. The orifices shall be the adjustable type and shall be properly adjusted by the contractor on the job so that hose pressure does not exceed 60 psig.

.3 NOZZLES: Fire hose nozzles shall be the adjustable fog nozzle type.

.4 FIRE HOSE RACKS shall be of a type that is easy to assemble and disassemble. Loose straight pin racks are prohibited.

.5 LOCATIONS: Hose and valve cabinets shall be located so that the centerline of the hose valve is in accordance with the NFPA Pamphlet 14 recommendations. The full fire rating and acoustical rating of the walls shall be maintained.

.6 HOSE CONNECTION: Where possible, all valves and fittings for fire department connections shall be rotated approximately 22-1/2° down from vertical to facilitate easy hose connection. Within the City of Columbus, threads shall be Columbus fire threads.

21 10 00. WATER-BASED FIRE SUPPRESSION SYSTEMS (Cont'd)

21 12 20. FIRE HOSE CABINETS AND ACCESSORIES: (Cont'd)

.6 HOSE CONNECTION: (Cont'd)

External to the city of Columbus, threads must be compatible with the equipment of the local fire department.

.7 RENOVATION PROJECTS: Require that the Physical Facilities Machine Shop be advised to take possession, before construction begins, of existing fire extinguishers for safe keeping.

21 13 00. FIRE-SUPPRESSION SPRINKLER SYSTEMS

.1 SPRINKLER SYSTEMS shall be automatic systems designed, installed, and tested according to the Ohio Building Code, the Authority Having Jurisdiction (AHJ), the local Fire Chief, State Fire Marshal, the requirements of the NFPA Pamphlet 13, STANDARDS FOR THE INSTALLATION OF SPRINKLER SYSTEMS, and the University Building Design Standards.

.2 SPECIAL INSTALLATIONS: Suppression systems for electrical equipment rooms, elevator equipment rooms, computer equipment rooms or similar spaces shall be designed so as not to present a hazard to occupants or equipment.

.2.1 Alternate fire protection systems permitted for these rooms are: (Note: An appeal may be required for plan approval by the Department of Industrial Relations.)

.2.1.1 Foam, NFPA 11.
.2.1.2 Carbon Dioxide, NFPA 12.
.2.1.3 Water Spray, NFPA 15.
.2.1.4 Dry Chemical, NFPA 17.

.3 ALTERNATE CONSTRUCTION: If occupancy permits, a firewall separation may be provided. If this construction is used, sprinklers are not required, but a smoke detector connected to the building fire alarm system must be provided.

.4 DRY SPRINKLER SYSTEMS: Provide a low pressure switch on all systems to detect a gradual loss of air pressure. Connect switch to fire alarm system as a distinct zone.

.4.1 Air Compressor shall be on a dedicated electrical circuit.

.5 INSPECTOR TEST VALVES: Test valves shall be as remote as possible for each zone, have piped-in drainage to allow for testing without the use of hoses or special adapters, be located in stairwells or some common, easily accessible location and contain a sight glass for visual inspection of the flow. Each sprinkler zone shall include one drain and one test station. The locations shall be coordinated with the associate and the University.

.6 All actual devices for low suction pressure, fire pump interruption, tamper switches, and pump room flow switches shall be wired into the main fire alarm panel as distinct zone annunciation. Specify and show which devices are to be furnished by the Electrical contractor, installed by the Fire Protection contractor, and wired by the Electrical contractor.

.7 All pressure switches, pumps, valves and similar devices shall be installed with isolating valves to facilitate replacement of devices.

21 13 00. FIRE-SUPPRESSION SPRINKLER SYSTEMS (Cont'd)

.8 All pumps, valves and similar devices shall be painted red. All piping shall be painted red or permanently banded red.

.9 System shall include back flow protection on the domestic water line as required to be consistent with the requirements of the local water department.

21 30 00. FIRE PUMPS

.1 CENTRIFUGAL TYPE PUMPS shall be provided; turbine vane pumps are prohibited. Installation shall comply with the Ohio Building Code (OBC), and NFPA 20, STANDARD FOR THE INSTALLATION OF CENTRIFUGAL FIRE PUMPS.

.2 CONTROLLER: Specify the following, all factory prewired and enclosed in a NEMA II floor mounted enclosure: One excess pressure controller containing magnetic starter, disconnect switch, dual pressure switch, three position selector switch, and an alarm bell to sound when the pressure drops below the second control point of the dual pressure switch.

.2.1 Coordination of Electrical Connections: Stipulate that the pump supplier coordinate the electrical connection lugs with the cable size being provided by the electrical contractor or provide junction boxes and terminal strips to match wire sizes indicated in the motor schedule on the electrical drawings.

.3 BEARINGS: Wherever practical, equipment shall be furnished with sealed ball or roller bearings. Specify that the contractor shall not lubricate sealed bearings.

.4 RELIEF VALVE AND DRAIN: The fire pump shall have a temperature relief valve integral with the casing. A valved discharge line to a test header located outside the building shall be provided for demonstration and operating tests. Provide an automatic ball check and drain line, piped to drain from the discharge line and test header system.

.5 FIRE PUMP TEST CONNECTIONS: The test connection cluster, with 2-1/2 in. valves; shall be located on the building exterior adjacent to the fire department siamese connection for the purpose of performing proper testing of the fire pump for initial acceptance and annual testing. Include piped drainage. Test valves shall have piped in drainage.

END OF DIVISION 21 – FIRE SUPPRESSION