

SECTION 5.21.10 – STANDPIPE SYSTEMS
DESIGN AND CONSTRUCTION STANDARD

PART 1 GENERAL

1.01 Scope of Standard

- A. This standard provides general requirements of The University of Texas at Austin for the design and construction of standpipe systems to include combination standpipe systems. This document is not intended to serve as a guide specification.
- B. The design guidelines contained herein include the requirements for fire protection systems at The University of Texas at Austin. It is the intention of this document to provide a minimum standard for fire protection systems at the University so as to provide the highest level of fire safety possible.

1.02 Scope of Work

- A. Provide all design and materials required to provide a complete fire protection system to protect the specified building in accordance with design requirements. Antifreeze loops are not permitted. The preference of the University is to connect to the campus Fire Water Distribution System (FWDS) provide code compliant combination wet automatic fire sprinkler and, where possible, automatic standpipe systems, that do not contain alarm valves or local alarm devices, and a minimum 10-psi or 10% safety factor, whichever is greater, without requiring a building fire pump. Jockey Pump, if utilized, must be supplied by domestic water source separate from water source serving standpipe.
- B. Reference Standards (Utilize latest editions available):
 - 1. NFPA 13-Installation of Sprinkler Systems.
 - 2. NFPA 14- Standard for the Installation of Standpipe and Hose Systems.
 - 3. NFPA 24-Installation of Private Fire Service Mains and their Appurtenances.
 - 4. NFPA 25-Standard for the Inspection, Testing, and Maintenance of Water Based Fire Protection Systems.
 - 5. NFPA 20-Standard for the Installation for Fire Pumps
 - 6. NFPA 72-National Fire Alarm and Signaling Code
 - 7. NFPA 101-Life Safety Code
 - 8. IBC-International Building Code

[SEE JOCKEY PUMP/PRV DETAIL IN THE 5.21.40 SECTION.]

- C. Standpipe systems must be installed where required by NFPA 101 or the latest edition of the International Building Code. All standpipe systems shall be Class I in all cases, regardless of minimum code requirements, and designed per the latest edition of NFPA 14. 2-1/2" hose valves are required at the intermediate stair landings within the required stairwells per NFPA 14 unless approved by the City of Austin. This may require a standpipe riser in each intermediate landing of all stairs and a separate fire sprinkler riser located in one main stair landing. Provide standpipe isolation control valves with tamper switches for each standpipe as required per NFPA 14. Locate isolation control valves within the stair enclosure and exposed for maintenance purposes.

SECTION 5.21.10 – STANDPIPE SYSTEMS
DESIGN AND CONSTRUCTION STANDARD

- D. The work addressed in this section consists of a fire protection system, which may include coordination with one or more of the following:
 - 1. Fire Alarm Systems
 - 2. HVAC and smoke control systems and fire, smoke, and combination fire/smoke dampers.
 - 3. Emergency power systems.
 - 4. Elevator installation. See the Texas State Elevator Code ASME/ANSI A17.1 and ASME/ANSI A17.3.
 - 5. Central control and monitoring system.

1.03 Related Work: References/Quality Assurance

- A. The University, the International Building Code, National Fire Codes as published by the National Fire Protection Association (NFPA), State Fire Marshal, and The University of Texas Fire Marshal's requirements contain fire protection criteria and requirements for the design of all fire suppression systems. The project shall conform to the following:
- B. Conform to a minimum of the latest edition of NFPA 14 for standpipe systems. Insurer may require design in excess of NFPA 14.

1.04 Submittals

- A. The University of Texas Project Manager shall review and distribute all submittals for approval by the University insurer, the UT Fire Marshal, UT FSSS, the Owner's representative, and others as appropriate.
- B. Refer to provisions established in the Project Specifications and in related section of Division 01 – General Requirements. All product data shall be submitted under provisions of Division 01.
- C. Manufacturer's data sheets shall be provided for all materials and equipment for approval before purchase or installation. Data sheets shall describe the type of material, capacities, manufacturer, part numbers of equipment, and give information necessary for verifying equipment approval.
- D. The Contractor shall submit detailed and accurate shop drawings prepared in accordance with NFPA 13, NFPA 14, NFPA 20, and NFPA 24 for approval of all equipment to be constructed and installed. Shop drawings shall identify all materials and list all equipment to be used. Shop drawings shall include ceiling grid or reflected ceiling layout and shall be coordinated with other trades prior to submittal. Shop drawings are to be submitted with a minimum 1/8" scale and all details at a minimum 1/4" scale.
- E. Hydraulic calculations for standpipe systems shall comply with NFPA 13 and shall include comprehensive hydraulic data sheets. Provide a 10 psi or 10% safety factor, whichever is greater, for all standpipe system hydraulic calculations.

SECTION 5.21.10 – STANDPIPE SYSTEMS
DESIGN AND CONSTRUCTION STANDARD

- F. Provide hydraulic calculations for automatic standpipes, where required per NFPA 14, to provide 100 psi when flowing 500 gpm at the most remote standpipe outlet and 250 gpm at each additional standpipe. Provide hydraulic calculations for manual standpipes to demonstrate the pressure available at the top of each standpipe while flowing the demand required per NFPA 14 utilizing both the available water supply and the nominal City of Austin fire truck pumper through the fire department connection.

- G. Prior to preparing shop drawings and hydraulic calculations, the design engineer is required to verify the adequacy of the water pressure and other pertinent water supply data from either the campus Fire Water Distribution System (FWDS) or the City of Austin water distribution system, depending on which system will be utilized to supply the new sprinkler and/or standpipe system. Hydrant flow tests performed on the University distribution system shall incorporate erosion control requirements identified in this standard. See 2.10L Field Acceptance. The design engineer shall immediately notify the UT Fire Marshal and Project Manager of the need for testing the appropriate water supply or fire pump, or the need for any special considerations required. The engineer shall provide the record data at the point of the new utility connection as follows:
 - 1. Building Name and flange elevation (ft)
 - 2. Test hydrants (hydrant numbers and location) and hydrant elevations (ft)
 - 3. Flow rate (gpm), static pressure (psi), and residual pressure (psi)
 - 4. All turning of valves and operation of fire pump to be performed by FSSS. Actual test to be performed by Contractor or Engineer utilizing their own equipment.
 - 5. If flowing water on campus, the Project Manager shall submit a request for approval to EH&S.

- H. No work shall be performed until the University has approved the shop drawings, calculations, and data sheets. The contractor is solely liable for any work performed prior to this approval.

PART 2 PRODUCTS

2.01 Piping and Fittings

- A. Refer to Section 5.21.00.

2.02 Valves

- A. Refer to Section 5.21 00.

2.03 Drains and Test Piping

- A. All trapped portions of the system shall be equipped with drains of the size specified in NFPA 14. Where possible, design a system that will completely drain to the system riser. Where any trapped water exists, provide an auxiliary drain per NFPA 14 and pipe to the sanitary sewer system. Drain valves and lines are to be sized at 1¼”

SECTION 5.21.10 – STANDPIPE SYSTEMS
DESIGN AND CONSTRUCTION STANDARD

minimum. All drains must be piped to the sanitary sewer. Drains cannot be piped to the exterior of the building or mop sinks.

- B. Every waterflow switch shall have an inspector's test connection located downstream of the water flow switch and piped to the sanitary sewer system. Inspector's test connections must comply with NFPA 13 and Section 5.21.00 of the UT Standards.
- C. A remote express drain line is required for all buildings with floor control assemblies in addition to the main / inspectors test drain. This drain line shall be installed in the remote stairwell from the supply standpipe. The drain line shall be piped to a sanitary sewer.

2.04 Standpipe Systems

- A. Where a standpipe system is required to be installed, the standpipe shall be designed as Class I, manual-wet or automatic-wet standpipe as required by NFPA 14 and the IBC.
- B. Where a standpipe system is required in a building or area where the temperature cannot be maintained above 40 degrees F at all times, a dry standpipe is required to be installed. Dry standpipe systems installed on campus shall be Class I, manual-dry standpipes as defined by NFPA 14. Provide galvanized pipe, fittings, and hangers for all dry standpipe systems.
- C. Each standpipe shall be installed with a UL listed 2-1/2 inch NST fire department hose connection with caps and located in the intermediate stairwell landing with caps on each floor, unless an alternate location is approved by the City of Austin. Where the distance between the stairwells exceeds the criteria indicated in NFPA 14, provide additional hose valves on each floor to maintain the minimum required distance between valve locations. Locate the additional hose valves in UL listed recessed valve cabinets utilizing only 2-1/2" hose valves without the hose.
- D. Provide standpipe isolation control valves supervised by the fire alarm system as required per NFPA 14. Locate standpipe isolation valves within stairwells and exposed, unless an alternate location has been approved by the University.
- E. Each standpipe shall have a drain sized at 1/4" minimum and be located in accordance with NFPA 14. Each drain shall be piped and discharged to a sanitary sewer. Drains cannot be piped to the exterior of the building or mop sinks.
- F. All dry standpipe system piping shall be installed so that the entire system may be drained back to the system riser. Where building conditions do not allow complete system drainage, provide auxiliary drains for all trapped sections of pipe in accordance with NFPA 13. The number of auxiliary drains shall be kept to a minimum and piped to a sanitary sewer.

SECTION 5.21.10 – STANDPIPE SYSTEMS
DESIGN AND CONSTRUCTION STANDARD

- G. Each dry standpipe shall be provided with an air and vacuum valve installed at the top of each riser. The air and vacuum valve shall be a 1 inch APCO Series 140 air and vacuum valve, manufactured by Valve and Primer Corporation or approved equal.
- H. Where required, a conveniently accessible two-way hose connection shall be provided at the roof level. If the building layout and construction permits, penetrations for the roof level hose connection shall be through an exterior wall and not through the roof.
- I. Manual wet standpipe systems calculated utilizing the responding fire department pumper truck for the required pressure and flow per NFPA 14 shall be tested utilizing the pumper truck to prove the hydraulic calculations submitted during design.
- J. Where a combination sprinkler/standpipe is provided, the floor control assembly supplying the sprinkler system is required to have a check valve per NFPA 14. A secondary drain in the most remote stairwell shall be installed in addition to the drain of the floor control assembly. Refer to Section 5.21.00.

2.05 Fire Department Connections

- A. Each fire department connection shall be flush wall-mounted type. Freestanding type fire department connections shall only be installed when approved by The University. Each fire department connection shall consist of a minimum of two 2-1/2-inch inlets with clappers compatible with equipment utilized by the City of Austin Fire Department and equipped with UL listed Knox caps keyed for the City of Austin Fire Department. The fire department connection shall be labeled to indicate the type of system served with raised letters at least one inch in size and cast on the escutcheon plate provided. The fire department connection shall not be less than two feet and not more than 3 feet 6 inches in elevation, measured from the ground level to the centerline of the inlets.

PART 3 EXECUTION

3.01 Guarantee

- A. The Contractor shall guarantee and service all workmanship and materials to be as represented by him, and shall repair or replace, at no additional cost to the Owner, any part thereof, which may become defective within the period of one (1) year after the date of final acceptance by the Engineer and UT. Contractor shall be responsible for, and pay for, any damages caused by, or resulting from defects in his work.

3.02 Qualifications

- A. System design and installation shall be supervised by a licensed NICET Level III sprinkler system technician or fire protection engineer with not less than five (5)

SECTION 5.21.10 – STANDPIPE SYSTEMS
DESIGN AND CONSTRUCTION STANDARD

years experience with sprinkler systems. Accurate As-Built drawings shall be required in the form of three hard copies and two copies on CD in the specified AutoCAD format. The signature of the RME or engineer constitutes an affidavit that the statements, representations, and information presented in the submittal constitute a complete operational system conforming to applicable state laws and recognized good engineering practices. All field installation work shall be continuously supervised by a NICET Level II or III sprinkler system technician.

3.03 Microbiological Influenced Corrosion (MIC)

- A. Provide testing on the City of Austin water supply or the campus FWDS, whichever will be supplying the new sprinkler and/or standpipe system, in accordance with the University for MIC testing procedures.
- B. Utilize methods and procedures for flushing sprinkler and standpipe piping as required by UT for MIC testing.

3.04 System Acceptance Testing and Commissioning

- A. **Perform acceptance tests according to NFPA 13 and UT Third Party Testing Guidelines** that apply to fire sprinkler system testing with a representative of UT Austin Fire Prevention Services and FSSS present. Prior to acceptance, accurate red-lines must be submitted and required training for UT personnel completed. Provide copies of test reports to the UT Fire Marshal and Fire Prevention Services and FSSS, as tests are completed. Provide a complete set of all test results to the University at the completion of the project and a copy in each O&M Manual.

3.05 Warranty

- A. Warranty must be good for one year.
- B. Contractor to respond to all warranty calls within 24 hours. If equipment cannot be repaired at this time, FSSS shall be updated daily with the progress and/or status.
- C. See Fire Alarm Warranty

END OF STANDARD