In this issue …

Commonwealth of Virginia
Department of General Services
Division of Engineering & Buildings

Suite 600
1100 Bank Street
Richmond, VA 23219

DEB Reopens EDR Submittals

Given the continuation of social distancing requirements, the improved capabilities of DEB staff to process and review documents remotely, and DEB's desire to make the review process more efficient and more economical for other state entities, DEB will be resuming normal EDR processing effective Monday, May 4, 2020. As of that date, the BITS "Agency Document Submittal" menu will be reactivated to allow agencies to upload project plans, specifications, and related documents.

We strongly encourage all agencies to take advantage of the EDR submittal method which places documents in DEB's review queue quicker than paper submittals and generates significant savings to agencies in document reproduction costs.

With the return to EDR, please note that one (1) paper "office copy" will still be required in addition to the electronic files and, at present, three (3) paper copies will still be required for "Permit Sets."

Effective May 4, DEB will also add shop drawings to the types of submittals allowed for EDR submittal. When making EDR submittals, please assure the correct project numbers, subproject numbers, and submittal types are entered. Please refer to CPSM Appendix S for complete submittal requirements.

Quick Links

BITS
Budget Development
CPSM
CPSM & VCCO Training
DEB Contacts
DEB Home Page
DEB Notices
Documents & Forms
Electronic Document Review (EDR)
Permits & Certificates

The DEB Newsletter is a monthly publication of the Department of General Services' Division of Engineering & Buildings. Prior Newsletter issues are available on the DEB Newsletter webpage.

To subscribe, visit the self-service DEB Newsletter Subscription webpage.

DEB NEWSLETTER

Issue No. 64

April 2020

Understanding Manual Wet Standpipe Systems

Introduction

Standpipes are fire protection systems consisting of piping, valves, and fittings for the purpose of delivering water to hose connections. Hose connections are commonly referred to as hose valves, or hose valves with threaded outlets. Many standpipes are part of a "combined system" that supply water to both the standpipe and fire sprinkler systems.

The codes and standards currently governing the installation of combined systems in Virginia are the *2015 Virginia Construction Code (VCC)*, the *2013 NFPA 14 Standard for the Installation of Standpipes and Hose Systems*, the 2013 edition of *NFPA 13R Standard for the Installation of Sprinklers Systems in Low-Rise Construction*, and the *2013 NFPA 13 Standard for the Installation of Sprinkler Systems*. Additional standards that are referenced in *NFPA 13* that are used for combined standpipe/fire sprinkler systems are the *2013 NFPA 24 Standard for the Installation of Private Fire Service Mains and Their Appurtenances* and the *2011 NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water Based Fire Protection Systems*. *Section 905 Standpipe Systems of the Virginia Construction Code* determines where standpipes are required while *NFPA 14 and NFPA 13* are the standards that determine how the systems are designed and installed. The *VCC* takes precedence over the *NFPA* standards should there be conflicts regarding the requirements.

This article is intended to assist architects, engineers, contractors, and owners in understanding manual wet standpipe systems. Standpipes in non-sprinklered buildings, automatic dry standpipes, automatic wet standpipes, manual dry standpipes, and semiautomatic dry standpipes are not addressed.

Manual Wet Standpipe Systems

By definition, manual wet standpipe systems always contain water and rely exclusively on a fire department pumper truck to supply the hydraulically calculated system demand. The system demand is the required flow rate in gallons per minute and required water pressure in pounds per square inch. Confirmation with the local fire department that their pumper trucks are capable of pumping the system demand is essential.

Due to their simplicity and economical installation requirements manual wet standpipe systems are the most utilized. These systems do not require a site installed fire pump.

Consider the following:

- Electrically driven fire pumps increase the installation cost substantially and may require back up power if the power supply is determined to be unreliable.
- Alternatively, a diesel fire pump with site stored fuel can stand in for an electrically driven fire pump, but have their own unique costs and challenges.
- Fire pumps add substantially to the initial system cost and require a dedicated fire pump room that has a rated separation from other spaces.
- The system demand for standpipes is almost always greater than the sprinkler demand. A fire pump is required to be sized for the larger of the two values.
- After the initial expense fire pumps need regular maintenance as required by NFPA 25.
- The economy and reliability of the local fire department's pumper is difficult to overstate.

DEB NEWSLETTER

Issue No. 64

April 2020

Understanding Manual Wet Standpipe Systems

The *Virginia Construction Code* (VCC) Section 905, requires Class III standpipe systems in buildings where the highest story is greater than 30 feet above the lowest level of fire department access. Most standpipes are installed vertically in interior exit stairways. They are also required to be installed on both sides of horizontal exits, exit passageways, in covered malls, at stages that are greater than 1000 square feet, at rooftops that have a slope of 4/12 or less and in remote areas of fully sprinklered buildings that are more than 200 feet from a hose connection.

A *VCC* exception allows Class I instead of Class III standpipes in buildings that have an automatic sprinkler system. This exception takes precedence over a somewhat conflicting *NFPA 14* section.

- **Class I standpipes** utilize 2.5-inch hose connections, and these are the most frequently utilized as many buildings have sprinkler systems. They are used by professional firefighters.
- **Class II standpipes** have 1.5-inch hose stations which include hoses for the use of professional firefighters and trained civilian personnel. These are rarely used today as civilian personnel are at risk and hoses are not often maintained adequately.
- **Class III standpipes** have both 2.5-inch hose connections and 1.5-inch hose stations. These are also infrequently used today as most buildings with standpipes also have sprinkler systems.

Class I Standpipe

Class II Standpipe

Class III Standpipe

Another *VCC* exception allows Class I manual wet standpipes in buildings that have an automatic sprinkler system and where the highest floor is located not more than 150 feet above the lowest level of fire department vehicle access. This often-misinterpreted exception was clarified in the revisions to the 2015 VCC. It takes precedence over the NFPA 14 section that requires automatic or semiautomatic standpipes for high-rise buildings. A high-rise building has an occupied floor more than 75 feet above the lowest level of fire department vehicle access.

Fire department connections are the first component of the building's standpipe system. The FDC must be located within 100 feet of a fire hydrant. Firefighters connect suction hoses from the fire hydrant to the pumper and then connect supply hoses from the pumper to the FDC allowing the system to be pressurized. Based on the hydraulic requirements the FDC will have two to four 2.5-inch inlets. Each 2.5-inch inlet can flow 250 gpm. A manual wet standpipe system may not be accepted until it has been tested using the fire department pumper to confirm that 100 psi is available at the most hydraulically remote hose connection. Occasionally an FDC may be charged to as much as 165 psi, if needed to obtain 100 psi. The additional charging pressure is up to the local fire department's procedures. If the needed charging pressure exceeds 150 psi at the FDC, then a sign stating the required pressure at the FDC is required. Basic FDC requirements are:

Basic FDC requirements are:

- The location of the FDC shall be approved by the local fire department.
- Occasionally a fire department requires a "Storz" connection instead of the standard 2.5-inch inlets. Storz connections are available in 4 and 5-inch diameters and were invented in 1882. These quick connect hose couplings are "sexless" and can be latched in a quarter-turn.
- The FDC shall have "STANDPIPE AND AUTOSPKR" in raised letters at least 1 inch high.
- The FDC shall be mounted 18 to 48 inches above grade.
- The FDC shall have a check valve and automatic drip valve. Both of these valves are required to be accessible for routine service.
- Shut off valves are not allowed in the piping from the FDC to the system piping.
- For safety reasons and where space is available remote installed FDCs are preferred over wall mounted FDCs.

DEB NEWSLETTER

Issue No. 64

April 2020

Understanding Manual Wet Standpipe Systems

General requirements:

- A 3.5-inch pressure gauge is required at the top of all standpipes.
- System water supply valves, isolation control valves, and valves in the feed mains shall be electronically supervised.
- All piping shall be supported in accordance with NFPA 13 Chapter 9.
- Hydraulic Design information signs are required.
- Where there are 2 or more standpipes they shall be interconnected.
- Isolation and isolation valves are required for all standpipes.
- Shut off valves are prohibited.

Minimum flow rates:

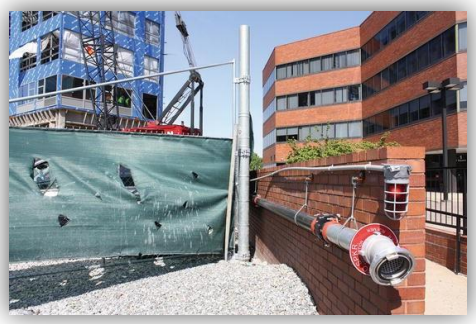
- 500 gpm at the standpipe with the two most hydraulically remote 2.5-inch hose connections. These are also known as outlets.
- 250 gpm for each additional standpipe.
- 1000 gpm total is the maximum flow rate for buildings with a sprinkler system.
- Stated in another way: 500 gpm for the most remote stair, 750 gpm total for the second stair and 1000 gpm total for the third stair or more.

Hose connections are the last component of the building's standpipe system. They are typically installed at the main floor levels in exit stairs. They may be located at the intermediate stair levels with permission from the authority having jurisdiction.

Basic hose connection requirements are:

- They shall be installed not less than 3 feet or more than 5 feet above the floor.
- They shall not be obstructed by closed or open exit stairway doors.
- They shall be located so that there is at least 3 inches of clearance between the handle and the wall or any other object. This is a new requirement to the 2013 edition of NFPA 14.
- Standpipes with hose connections installed in exit stairways shall not reduce the required means of egress width.

Construction standpipes are required by VCC Section 3311 during both the construction and demolition of buildings where the highest floor is greater than 30 feet above the lowest level of fire department vehicle access. Often these temporary standpipes can be incorporated into the permanent system. These temporary systems can be manual dry standpipes. A fire hydrant within 100 feet of the FDC is required. At least one 2.5-inch FDC inlet is required along with 2.5-inch hose connections at each level. The location must be coordinated with the local fire department and may not be obstructed by construction operations or fences.



Summary

It is important that design professionals review the requirements in Section 905 of the Virginia Construction Code prior to designing a standpipe system to the NFPA 14 standard. The VCC has unique requirements that take precedence over NFPA 14. Design professionals need to be aware of the practical and economic advantages of using a manual wet standpipe system.

Quality control by managers and inspectors on behalf of building owners can be improved by knowing the technical requirements of the codes and standards. Professionally designed, constructed, and tested combination standpipe/sprinkler systems will improve life safety, building protection and assist professional firefighters in performing their roles.

DEB NEWSLETTER

Issue No. 64

April 2020

Emergency Facilities

Temporary Certificate of Use and Occupancy for Emergency Facilities

Recent news coverage highlights U.S. Army Corps of Engineers adaptations of large convention centers into field hospitals to treat COVID-19 patients. Noteworthy facilities include the Javits Center in New York City, adapted to a 2,900-bed facility, McCormick Place in Chicago, adapted to a 1,750 bed facility, and Music City Center in Nashville, adapted to a 1,600-bed facility.

Javits Center, New York City

McCormick Place, Chicago

Agencies are sometimes approached by localities requesting use of their facilities for emergency purposes. In the past, this request has been for temporary evacuation shelters from hurricane and flood prone areas. Most recently, this request is for temporary COVID-19 facilities.

DEB, acting as the Building Official for state-owned buildings, evaluates the proposed use from the building code perspective and issues a Temporary Certificate of Use and Occupancy once the building is deemed acceptable for the temporary use.

For the safety of all occupants, it is imperative to obtain a Temporary Certificate of Use and Occupancy prior to allowing alternate use of a facility.

Agencies need to be involved with the process and assign a Project Manager to assure the Temporary Certificate of Use and Occupancy is obtained prior to the alternate use and once the emergency event ends, assure the building is returned to the agency in the manner found prior to its adaptation for the emergency event.

Certificate of Use and Occupancy / Change in Use and Occupancy

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
CO-13.3, Certificate of Use and Occupancy

Group classification is a key component in prescribing the appropriate life safety measures needed when designing a building. Throughout the code, group classifications are utilized to determine the appropriate construction and occupant safety requirements such as building area & height, means of egress, plumbing fixtures, rated separations and fire alarm systems.

Once documentation requested as described below is received, DEB will evaluate the proposed temporary change in use consistent with life safety group classification requirements of the building code.

Typical ACS facilities desired for COVID-19 or non-COVID-19 “hospitals” are large gymnasiums, arenas or convention centers (Group A-3 or A-4) and hotels (Group R-2). It is necessary to obtain a Temporary Certificate of Use and Occupancy for the revised hospital use (Group I-2).

Typical facilities desired for Emergency Hurricane Evacuation Shelters are large gymnasiums, arenas or convention centers (Group A-3 or A-4). It is necessary to obtain a Temporary Certificate of Use and Occupancy for overnight, sleeping accommodations or residential use (Group R-1).

Emergency Facilities

COVID-19 - Alternate Care Sites (ACS)

To help address an anticipated surge in hospitalizations around the state related to COVID-19, several facilities are planned to accommodate low to moderate acuity patients so that existing hospitals can serve more severe cases. Virginia Department of Emergency Management (VDEM) is working with the Corp of Engineers and the Federal Emergency Management Agency (FEMA) to convert the facilities into Alternate Care Sites (ACS).

Javits Center, New York City

An Alternate Care Site (ACS) is a facility that is temporarily converted for healthcare use during a public health emergency to reduce the burden on hospitals and established medical facilities. Implementation of Alternate Care Sites is a State-led and managed process. It is important for the agency to assign a project manager to oversee the process and obtain a Temporary Certificate of Use and Occupancy.

Items requiring DEB review for Temporary Certificate of Use and Occupancy for an ACS include:

1. A current State Fire Marshal's Office (SFMO) Inspection report for the existing building use with no significant deficiencies.
2. The current Certificate of Use and Occupancy.
3. Written programmatic intent. Include anticipated duration of temporary occupancy.
4. Floor plans of the facility indicating areas of occupancy and occupant load (patients & staff).
5. Identify furnishings & equipment being brought in. Show on floor plans.
6. Plumbing fixture count.
7. Indicate if the facility is ADA accessible.
8. Identify if patients scheduled are capable of self-preservation (evacuating without staff assistance).
9. List type of hazardous materials and quantities, as defined in VCC Tables 307.1(1) & (2), scheduled for use in the building.
10. Itemize fire safety systems in place (e.g., fire extinguishers, emergency lighting, fire sprinklers and fire alarm).
11. Provide documentation for any building modifications. For example, in Chicago, workers installed more than 100 new water lines, 1,000 electrical outlets, and installed more than 100 data lines for records.
12. Forward operational procedure / protocol required in the event of an emergency, prior to evacuation, along with emergency evacuation sketches of the floor plan. Account for persons requiring assistance from staff members to evacuate.

Emergency Facilities

Emergency Evacuation Shelters

In addition to the recent need for field hospitals, there is often the need for Emergency Evacuations Shelters due to natural disasters. Since 2008, DEB has been working with the Department of Social Services (DSS) State Managed Shelters Program for Special Use Permits issued by DEB on an annual basis for a number of Evacuation Shelters at state agencies, especially at Higher Education facilities.

Evacuation Shelters are locations that are safe destinations for the general public when the Governor declares a State of Emergency. For example, if a hurricane threatens Virginia Beach, an Evacuation Shelter in another part of the state could be a designated destination for the public, to provide a safe, temporary location until the crisis has passed.

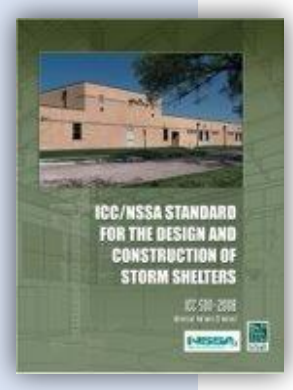
It is important to note that these facilities are **NOT** Community Storm Shelters, which are required to meet higher criteria than Evacuation Shelters. Storm Shelters provide for shelter in the path of a storm whereas simple Evacuation Shelters only provide shelter outside of the area of the storm.

The key difference hinges on VUSBC 423 which requires Storm Shelters to be designed in accord with ICC 500. Because ICC 500 requires a 160 mph design wind speed, there are very few, if any, buildings in Virginia that currently meet the robust criteria for a Storm Shelter.

ICC 500 provides the minimum requirements to safeguard public health, safety, and general welfare relative to the design, construction, and installation of Storm Shelters constructed for protection from high winds associated with tornadoes and hurricanes. Specific structural design criteria, site selection, occupancy, access, means of egress and fire protection are all addressed in ICC 500. This standard is used in conjunction with the Virginia Construction Code (VCC) or Virginia Existing Building Code (VEBC).

Items requiring DEB review for Temporary Certificate of Use and Occupancy for an Emergency Evacuation Shelter include:

1. A current State Fire Marshal's Office (SFMO) Inspection report for the existing building use with no significant deficiencies.
2. The current Certificate of Use and Occupancy.
3. Written programmatic intent. Include anticipated duration of temporary occupancy.
4. Floor plans of the facility indicating areas of occupancy and occupant load (evacuees & staff).
5. Identify furnishings & equipment being brought in. Show on floor plans.
6. Plumbing fixture count.
7. Indicate if the facility is ADA accessible.
8. Itemize fire safety systems in place (e.g., fire extinguishers, emergency lighting, fire sprinklers and fire alarm).
9. Forward operational procedure / protocol required in the event of an emergency. A dedicated, full time fire watch is required in all Evacuation Shelters. Provide 24 hour fire watch with at least one approved means for notification of the fire department. The only duty of the fire watch personnel shall be to perform constant patrols of the protected premises and keep watch for fires.



Summary

When any temporary change in use and occupancy is planned, it is extremely important, for the safety of occupants, to obtain approval from DEB for the alternate use. This applies not only to COVID-19 - Alternate Care Sites (ACS) and Emergency Evacuation Shelters, but anytime a building is used in a manner that varies from the building's designed use. As an example, use of a library or gymnasium for an overnight sleeping event requires DEB review and approval. Contact your Lead Reviewer if you have any questions.

DEB NEWSLETTER

Issue No. 64

April 2020