



CHARLOTTE FIRE DEPARTMENT
Fire Prevention Bureau
Standard Operating Guidelines

FPB 221

Acceptance Testing of Standpipe Systems

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Approved: *Jonathan Leonard*

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Purpose:

Standpipe systems are a vital element of fire protection systems and therefore, their installation must be subjected to acceptance testing to ensure that the installation and fire flow of these systems adequately meets the applicable standards and requirements. These guidelines are established to aid the inspector in the proper testing procedures of such systems.

Policy:

I. General Requirements

- A. All standpipe systems shall be subjected to an acceptance test and approval prior to the issuance of a Certificate of Occupancy (CO). It shall be the sole responsibility of the inspector in charge of issuing the CO to coordinate these tests. Standpipe system shall be designed to meet the required pressures and fire flows established by NFPA 14. Designers shall utilize an assumed 150 psi truck pump outlet pressure for the purpose of hydraulically designed standpipe systems.
- B. Reviewed drawings shall be furnished to the fire official prior to the acceptance test. The drawings shall show the location, arrangement, water supply, equipment and all other details necessary to establish compliance with the North Carolina State Fire Code, NFPA 13, and NFPA 14.
- C. Non high-rise buildings protected by an approved fire sprinkler system installed in accordance with NFPA 13 or NFPA 13R shall have either a Class I manual wet or Class I automatic/semiautomatic wet standpipe system installed.
- D. Prior to conducting the acceptance tests, the inspector shall:
 1. Have the person authorizing the tests sign the Charlotte Fire Department release form titled "Water-Based Fire Protection Systems Test Release Form".
 2. Verify that all system components, (FDC, hose connection threads, etc.), meet the requirements of the fire department, North Carolina State Fire Code and applicable NFPA standards.

3. The inspector shall be provided with all necessary installation and test certificates (i.e. Contractor's Material and Test Certificates for both above and belowground piping, Fire Pump Test Certificate, etc.).

E. All tests will require the use of an engine company to supply the standpipe system. The inspector conducting the test shall make arrangements to have an engine company on-site to assist in conducting the acceptance test.

F. If it is determined that the roadway may be blocked by hose due to the location of the hydrant used for the test, the inspector shall make proper arrangements with the City's Department of Transportation and CMPD.

II. Equipment Required

A. All equipment for conducting the system acceptance test shall be provided by the installer.

1. Hose Monster fitted with 1- $\frac{3}{4}$ inch insert, or deck gun with a smooth bore nozzle with a 1- $\frac{3}{4}$ inch tip.
2. A sufficient length of 2- $\frac{1}{2}$ inch hose.

III. Testing of Dry/Wet Standpipe Systems (no fire pump or fire pump off)

A. The crew of the engine company should connect to the nearest fire hydrant and supply the fire department connection with two-2- $\frac{1}{2}$ inch hoses.

B. A minimum of one section of 2- $\frac{1}{2}$ inch hose shall be connected to the most remote standpipe hose connection, and connected to either a deck gun or hose monster.

C. Once all hose and testing equipment is in place, the pump operator should pressurize the system. The initial pump outlet pressure should be set to 100 psi.

D. Once the system has been charged, the sprinkler company representative should open the standpipe hose valve to initiate water flow.

E. After the system has been flushed of oils and other possible debris, the outlet pressure on the truck pump outlet should be increased to 150 psi. At this point, note the discharge nozzle pressure. Inlet pressure should be increased in intervals of 25psi until the required fire flow is achieved. ***In no circumstances should the system be pressurized in excess of 350psi for a high rise building, or 175psi for a non-high rise building.***

F. The following flow requirements shall be used as a guide in determining if the system meets the required fire flow:

1. High-rise systems shall provide a minimum of 500gpm at the most remote hose connection, plus an additional 250gpm for each additional standpipe, to a maximum of 1000gpm.
2. For buildings not classified as “high-rise”, the system must provide 500gpm at the most hydraulically calculated remote point, with a minimum 100 psi residual pressure.

G. If the system fails to provide the required flow and pressures indicated above, the system has failed the acceptance test. The installer shall be consulted to determine possible reasons (i.e. system obstructions, improperly installed check-valves, available water supply, etc.).

H. At no time should a CFD member turn system valves, move or handle a charged hose, or hold hose while conducting a standpipe test.

IV. Testing of Wet Standpipe Systems With a Fire Pump

A. When testing standpipe systems with a fire pump, the systems must be tested and approved:

1. Utilizing the building’s fire pump without the use of the CFD engine company’s pump.
2. Utilizing the CFD engine company’s pump while bypassing the building’s fire pump.

B. The building’s fire pump must be on permanent power and certified by the pump installer/manufacturer. The fire inspector shall request the proof of certification prior to conducting the acceptance test.

C. 2-1/2 inch hose shall be connected to the remote standpipe hose connection and connected to either a deck gun or hose monster.

D. The fire inspector shall direct the sprinkler company representative to open the standpipe valve to initiate water flow. The fire pump shall turn on automatically resulting from the drop in pressure.

E. After the system is flushed of oils and other possible debris, the discharge pressure at the nozzle shall be noted. A fire pump cannot be adjusted during the test. If the required flow is not obtained, the test shall end, and it shall be noted that the test failed.

F. The following flow requirements shall be used as a guide in determining if the system meets the required fire flow:

1. High-rise systems shall provide a minimum of 500gpm at the most remote hose connection, plus an additional 250gpm for each additional standpipe to a maximum of 1000gpm. A minimum 100 psi residual pressure is required.

2. For buildings not classified as “high-rise”, the system must provide 500gpm at the most hydraulically calculated remote point with a minimum 100 psi residual pressure.

G. After completing the acceptance test with the building’s fire pump, the procedure shall be repeated following the steps in section III above for utilizing the CFD engine company.

V. Documentation

A. For all tests, the inspector shall complete an inspection report and indicate which tests were performed and the results.