City of Alexandria

Department of Code Administration

Fire Alarm, Detection, Suppression and Control Systems Inspection and Testing Protocol

8/4/20

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HIGH-RISE FIRE ALARM SYSTEMS

All Testing Shall Conform to Chapter 9 of the 2015 VCC and NFPA 72 2013 Requirements. Also applies to Low Rise and Tennant Systems.

I. Personnel:

- Two Fire Protection Systems Inspectors (More, if there are multiple annunciation points)
- Two Contractors / Technicians
- Other trades as required to conduct test

II. Time Required:

- Eight Hours Estimated Minimum (Complete Building)

III. Pre –Test Conditions and Policies:

- At the beginning of the witnessed fire alarm test, the fire alarm system shall be placed on battery power and remain on battery power until such time the Fire Systems Inspector has witnessed at least one of each type of system signal not to exceed 15 minutes. While operating on battery, supervisory and alarm current measurements will be taken by the contractor with measured values calculated to verify capacity by the Fire Systems Inspector.
- After removing the system from battery power, the fire alarm system shall be returned to normal ready condition with no alarms or troubles on the system and all panels closed.
- All fire alarm devices shall be pre-tested and the contractor shall provide a Record of Completion and U. L. Central Station Certificate (if required), to the Fire Systems Inspector before the acceptance test is started.
- The Fire Protection Systems Inspector shall not serve to develop a punch list.
- Reprogramming of addressable systems during the test shall be allowed at the discretion of the Fire Systems Inspector.
- All approved plans, operation manuals, cut sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke, hand tools, hoses, manometer, sound pressure level meter, multi-meter, heat gun, ladders, lifts, keys, pass cards, etc.).
- All required Digital Alarm Communication Transmitters, phone lines, and Central or Remote Station signal receiving centers, circuits, and systems shall be in place, tested, and ready for service at least 24 hours prior to the start of the acceptance test.
- A key repository (Knox Box) shall be installed near the entrance to the building with labeled building access keys or cards and fire alarm system keys inside of the box prior to the acceptance test.
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems. Conspicuously posted notices shall be placed at all main entrances and on all floors.
- Contractor shall coordinate the test with all other affected trades (e.g. sprinkler, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.

- Failing fire alarm systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- The contractor shall have the system in normal ready mode when the Fire Systems Inspector arrives and shall not place the system into test mode prior to the start of the inspection or test.
- The Fire Protection Systems Inspector shall notify the Alexandria Fire Communications Center via radio or telephone at 703-746-4444 to disregard all alarms and request the Communication Center notify the Fire Systems Inspector when the alarm signals are received.
- Once the Fire Systems Inspector is notified by the Alexandria Fire Communications Center the central or remote station has acknowledged alarm, supervisory, and trouble signals, the contractor shall notify the central or remote station of the test and place the system in test mode.
- All new, replaced, and relocated fire alarm initiation and supervision devices shall be visually inspected and operationally tested under actual operational conditions using the manufacture's recommended procedures or the "Test Methods" table in NFPA 72. No simulated operation is allowed or acceptable. (e.g. water must move through pipe for a flow switch, valve handle must be turned for a tamper switch) All device types, locations, and functions shall be verified. (Note: If wet, dry, or clean agent systems are installed, caution must be taken not to accidentally discharge these systems unless they are a part of a specific test procedure).
- All new, replaced, and relocated fire alarm notification appliance device operation shall be audibly and visually verified using the appropriate test equipment as necessary. All device types, locations, functions, annunciation, and signal shall be verified.
- If a new system and an existing system are interconnected, all existing devices known to be affected by the interconnection shall be tested through the new system.
- Fire alarm system devices shall be tested under normal power and standby power as directed by the Fire Protection Systems Inspector.
- Random tests shall be made on all system circuits, loops, and lines located between devices, the main fire alarm / annunciator panels, and the remote dialer to confirm continuity and the actuation of a system trouble signal when continuity is lost.
- Text display messages and annunciation shall be verified at all locations throughout a facility to include main fire alarm panel, annunciator panel, video monitor displays, and printers. Each display shall provide the appropriate information and replicate device, zone, floor, and signal type.
- Verify Fire Command Station contains voice/alarm signaling system controls, fire department communication system controls, automatic detection and alarm system annunciator panels, an annunciator that visually indicates the floor location of elevator and whether they are operational, status indicators and controls for air handling systems, controls for unlocking all stairway doors simultaneously, emergency and standby power status indicators, and telephone for fire department use with controlled access to the public telephone system.
- All voice/alarm signaling systems and devices shall be tested under actual field conditions.
- All fire department communication systems throughout the facility shall be tested under actual operational conditions.

- All electric door locking and release systems shall be tested under actual operational conditions.
- All HVAC control, smoke control, stairwell pressurization, and door release functions shall be tested under actual operational conditions.
- All elevator override and recall functions shall be tested under actual operational conditions.
- All access control and latch control devices shall be tested under actual operation conditions.
- Verify stairwell identification is in place and matches annunciator panel layout.
- Instead of the 24-hour battery test, I will be acceptable to test as follows: Place system on battery power, initiate one or each type of device installed and run for 15 minutes. After 15 minutes, while still on battery power, initiate a single device to ensure annunciation.
- Prior to Final Inspection, contact FPS Inspector for coordination of Fire Department Door Opening function on annunciator in order to arrange for a KNOX key to be on-site. Contact information is as follows:
- All high-rise fire alarm systems that are to be of a phase occupancy shall have ALL core fire alarm and associated devices installed and operational. No testing shall commence if all core and shell devices are not installed. All phased inspections shall be logged and dated with the floor locations and devices tested by the contractor for reference by the Fire Systems Inspector upon return for the next inspection process.
- Once the phasing is complete, the fire alarm system shall be re-tested by the Fire Protection Systems Inspectors to verify the proper annunciation and alarm notification at the Fire Command Center and all Graphic annunciation locations. The Fire Inspectors shall be allowed to also verify the notification devices inside the units. (Horn/Voice and visual)

LOW-RISE FIRE ALARM

I. Personnel:

- Two Fire Protection Systems Inspectors (More, if there are multiple annunciation points)
- Two Contractors/Technicians
- Other trades as required to conduct test

II. Time Required:

- Two Hours Minimum

III. Pre –Test Conditions and Policies:

- At the beginning of the witnessed fire alarm test, the fire alarm system shall be placed on battery power and remain on battery power until such time the Fire Systems Inspector has witnessed at least one of each type of system signal not to exceed 15 minutes. While operating on battery, supervisory and alarm, current measurements will be taken by the contractor with measured values calculated to verify capacity by the Fire Systems Inspector.
- After removing the system from battery power, the fire alarm system shall be returned to normal ready condition with no alarms or troubles on the system and all panels closed.
- All fire alarm devices shall be pre-tested and the contractor shall provide a Record of Completion and U. L. Central Station Certificate (if required), to the Fire Systems Inspector before the acceptance test is started.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.
- Reprogramming of addressable systems shall be allowed during test at the discretion of the Fire Protection Systems Inspector.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke, hand tools, hoses, manometer, sound pressure level meter, multi-meter, heat gun, ladders, lifts, keys, pass cards, etc).
- All required Digital Alarm Communication Transmitters, phone lines, and Central or Remote Station signal receiving centers, circuits, and systems shall be in place, tested, and ready for service at least 24 hours prior to the start of the acceptance test.
- A key repository (Knox Box) shall be installed near the entrance to the building with labeled building access keys or cards and fire alarm system keys inside of the box prior to the acceptance test.
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems. Conspicuously posted notices shall be placed at all entrances and on all floors.
- Contractor shall coordinate the test with all other affected trades (e.g. sprinkler, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- Failing fire alarm systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- The contractor shall have the system in normal ready mode when the Fire Systems Inspector arrives and shall not place the system into test mode prior to the start of the inspection or test.
- The Fire Protection Systems Inspector shall notify the Alexandria Fire Communications Center via radio or telephone at 703-746-4444 to disregard all alarms and request the Communication Center notify the Fire Systems Inspector when the alarm signals are received.
- Once the Fire Protection Systems Inspector is notified by the Alexandria Fire Communications Center the Central or Remote station has acknowledged alarm, supervisory, and trouble signals, the contractor shall notify the central or remote station of the test and place the system in test mode.
- All new, replaced, and relocated fire alarm initiation and supervision devices shall be visually inspected and operationally tested under actual operational conditions using the manufactures recommended procedures or the "Test Methods" table in NFPA 72. No simulated operation is allowed or acceptable. (e.g. water must move through pipe for a flow switch, valve handle must be turned for a tamper switch) All device types, locations, and functions shall be verified. (Note: If wet, dry, or clean agent systems are installed, caution must be taken not to accidentally discharge these systems unless they are a part of a specific test procedure).
- All new, replaced, and relocated fire alarm notification appliance device operation shall be audibly and visually verified using the appropriate test equipment as necessary. All device types, locations, and functions shall be verified.
- If a new system and an existing system are interconnected, all existing devices known to be affected by the interconnection shall be tested through the new system. In addition, 10 percent of total system initiating device that are not directly affected by the interconnection up to a maximum of 50 devices shall also be tested.
- Fire alarm system devices shall be tested under normal power and standby power as directed by the Fire Protection Systems Inspector.
- Random tests shall be made on all system circuits, loops, and lines located between devices, the main fire alarm / annunciator panels, and the remote dialer to confirm continuity and the actuation of a system trouble signal when continuity is lost.
- Text display messages and annunciation shall be verified at all locations throughout a facility to include main fire alarm panel, annunciator panel, video monitor displays, and printers. Each display shall provide the appropriate information and replicate device, zone, floor, and signal type.
- All electric door locking and release systems shall be tested under actual operational conditions.
- All door release functions shall be tested under actual operational conditions.
- All elevator override and recall functions shall be tested under actual operational conditions.
- All access control and latch control devices shall be tested under actual operation conditions.
- Verify stairwell identification is in place and matches annunciator panel layout.
- Instead of the 24-hour battery test, I will be acceptable to test as follows: Place system on battery power, initiate one or each type of device installed and run for 15 minutes. After 15 minutes, while still on battery power, initiate a single device to ensure annunciation.
- Prior to Final Inspection, contact FPS Inspector for coordination of Fire Department Door Opening function on annunciator in order to arrange for a KNOX key to be on-site.

TENANT SPACE FIRE ALARM

I. Personnel:

- One Fire Protection Systems Inspector (More, if there are multiple annunciation points)
- One Contractor
- Other trades as required to conduct test

II. Time Required:

- One Hour Maximum

III. Pre –Test Conditions and Policies:

- All fire alarm devices shall be pre-tested and the contractor shall provide a Record of Completion to the Fire Systems Inspector before the acceptance test is started.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.
- Reprogramming of addressable systems shall be allowed during test at the discretion of the Fire Systems Inspector.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke, hand tools, hoses, manometers, sound pressure level meter, multi-meter, heat gun, ladders, lifts, keys, pass cards, etc).
- All required Digital Alarm Communication Transmitters, phone lines, and Central or Remote Station signal receiving centers, circuits, and systems shall be in place, tested, and ready for service at least 24 hours prior to the start of the acceptance test if required.
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems and conspicuously post notices at all entrances and on all floors.
- Contractor shall coordinate the test with all other affected trades (e.g. sprinkler, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- Failing fire alarm systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

- Prior to beginning the test, all Fire Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- The contractor shall have the system in normal ready mode when the Fire Systems Inspector arrives and shall not place the system into test mode prior to the start of the inspection or test.

- The Fire Protection Systems Inspector shall notify the Alexandria Fire Communications Center via radio or telephone at 703-746-4444 to disregard all alarms and request the Communication Center notify the Fire Systems Inspector when the alarm signals are received.
- Once the Fire Protection Systems Inspector is notified by the Alexandria Fire Communications Center the Central or Remote station has acknowledged alarm, supervisory, and trouble signals, the contractor shall notify the central or remote station of the test and place the system in test mode.
- All new, replaced, and relocated fire alarm initiation and supervision devices shall be visually inspected and operationally tested under actual operational conditions using the manufactures recommended procedures or the "Test Methods" table in NFPA 72. No simulated operation is allowed or acceptable. (e.g. water must move through pipe for a flow switch, valve handle must be turned for a tamper switch) All device types, locations, and functions shall be verified. (Note: If wet, dry, or clean agent systems are installed, caution must be taken not to accidentally discharge these systems unless they are a part of a specific test procedure).
- All new, replaced, and relocated fire alarm notification appliance device operation shall be audibly and visually verified using the appropriate test equipment as necessary. All device types, locations, and functions shall be verified.
- If a new system and an existing system are interconnected, all existing devices known to be affected by the interconnection shall be tested through the new system. In addition, 10 percent of total system initiating device that are not directly affected by the interconnection up to a maximum of 50 devices shall also be tested.
- Fire alarm system devices shall be tested under normal power and standby power as directed by the Fire Systems Inspector.
- Random tests shall be made on all system circuits, loops, and lines located between devices, the main fire alarm / annunciator panels, and the remote dialer to confirm continuity and the actuation of a system trouble signal when continuity is lost.
- Text display messages and annunciation shall be verified at all locations throughout a facility to include main fire alarm panel, annunciator panel, video monitor displays, and printers. Each display shall provide the appropriate information and replicate device, zone, floor, and signal type.
- All electric door locking and release systems shall be tested under actual operational conditions.
- All door release functions shall be tested under actual operational conditions.
- All elevator override and recall functions shall be tested under actual operational conditions.
- All access control and latch control devices shall be tested under actual operation conditions.

FIRE ALARM MONITORING
All Testing Shall Conform to NFPA 72 2013 Requirements

I. Personnel:

- One Fire Protection Systems Inspector
- One Contractor

II. Time Required:

- Thirty Minutes

III. Pre-Test Conditions and Policies:

- All required Digital Alarm Communication Transmitters, phone lines, and Central or Remote Station signal receiving centers, circuits, and systems shall be in place, pre-tested, and ready for service at least 24 hours prior to the start of the acceptance test.
- Verify the dialer system is connected to a minimum of two separate phone lines and confirm the lines have different phone numbers by calling Alexandria Fire Communications to verify the telephone numbers.
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems and conspicuously post notices at all entrances and on all floors.
- Contractor shall coordinate the test with all other affected trades (e.g. sprinkler, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- Reprogramming of an addressable system shall be permitted during test at the discretion of the Fire Protection Systems Inspector.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke, hand tools, hoses, manometers, sound pressure level meter, multi-meter, heat gun, ladders, lifts, keys, pass cards, etc.).
- Failing fire alarm systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- The contractor shall have the system in normal ready mode when the Fire Systems Inspector arrives and shall not place the system into test mode prior to the start of the inspection or test.
- The Fire Systems Inspector shall notify the Alexandria Fire Communications Center via radio or telephone at 703-746-4444 to disregard all alarms and request the Communication Center notify the Fire Systems Inspector when the alarm signals are received.

- Remove primary power, actuate an initiating device and verify the appropriate signals are received at the monitoring station. On completion of test, restore system to normal.
- Verify the failure of the primary transmission path results in a trouble signal being transmitted via the secondary path to the monitoring station within 4 minutes of the detection of the fault.
- Verify the failure of the secondary transmission path results in a trouble signal being transmitted via the primary path to the monitoring station within 4 minutes of fault.
- Verify the failure of both line results in a trouble signal at the facility.
- Verify system is capable of seizing the telephone line, disconnecting outgoing or incoming calls, and preventing its use for outgoing calls until signal transmission is completed.
- Verify system can reset and retry if first attempt to complete signal transmission sequence is unsuccessful a minimum of five and a maximum of ten attempts.
- Verify a fire alarm signal is received at the Central Station Monitoring facility and appropriately transmitted to the Alexandria Fire Communications Center.
- Verify trouble and supervisory signals are received at the Central Station Monitoring facility and appropriately transmitted to the Alexandria Fire Communications Center.

UNDERGROUND FIRE SERVICE MAINS, LEAD-IN CONNECTIONS, AND FREE-STANDING FIRE DEPARTMENT CONNECTIONS

All Testing Shall Conform to NFPA 24 2013 Requirements

I. Personnel:

- One Fire Protection Systems Inspector
- One Contractor

II. Time Required:

- Thirty Minutes - Flow / Flush test
- Two Hours and Fifteen Minutes - Hydrostatic test

III. Pre-Test Conditions and Policies:

- All underground fire service mains, lead-in connections, and free-standing fire department connections shall be pre-tested and the contractor shall provide a Contractor's Material and Test Certificate to the Fire Systems Inspector before the acceptance test is started.
- All approved site plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment shall be on site and available before the acceptance test is started. (Includes radios, hand tools, hoses, gauges etc.).
- If practical or necessary, contractor shall notify all affected parties and affected trades to ensure the appropriate trade representative or authority is present during the witnessed test.
- All underground fire service mains, lead-in connections, and free-standing fire department connections shall be visually inspected and hydrostatically tested in the presence of a Fire Systems Inspector before pipe is covered.
- Trench shall be backfilled between joints before testing to prevent movement of the pipe.
- All underground fire service mains, lead-in connections, and free-standing fire department connections shall be flushed in the presence of a Fire Systems Inspector with the appropriate documentation on site to confirm test results.
- The Fire Systems Inspectors shall not serve to develop a punch list.
- Failing underground fire service mains, lead-in connections, and freestanding fire department connections may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

Visual Inspection

- Verify pipe is the specified size, of the appropriate material, in the proper location, and conforms to all requirements of the approved site plan.
- Verify pipe is buried a minimum of 4 feet below grade measured from the top of the pipe.

- Verify all bend, tees, plugs, cap bends, and hydrant branch lines are properly restrained from movement by the appropriate method. (Pipe clamps, tie rods, thrust blocks, locked mechanical or push on joints, mechanical joints utilizing setscrew retainer glands, or other approved method).
- Verify all restraining components are of the specified size, material, listed for the use, and properly connected.
- Verify all restraining components and devices are cleaned and coated with approved corrosion-retarding materials.
- Verify that any pipe installed through footers and under buildings shall have rods to a point at least 5 feet outside of the building.
- Verify that rod going from first fitting outside building to the first joint inside building is properly coated with code compliant coating (Example: Bituminous Coating) Also, verify that the rod is continuous and not attached to the wall with unapproved methods.

Hydrostatic Testing

- All underground fire service mains, lead-in connections, and free-standing fire department connections shall be hydrostatically tested for two hours at 200 psi or at 50 psi in excess of the maximum static pressure, whichever is greater.
- Observe all points of connection for leaks, damage, or other detrimental conditions.
- After two hours minimum, re-inspect all points of connection for leaks, damage, or other detrimental conditions.
- Observe release of water pressure and confirm the test gauge returns to zero psi.

Flush

- Outlet used for flushing shall be equal in size to the pipe being flushed.
- Observe thorough flush of underground fire service mains and lead-in connections at the minimum rate of flow not less than the system demand rate or not less than that necessary to provide a velocity of 10 feet /second, whichever is greater. Flow rate to meet required velocity is based on line size. Refer to NFPA 24 for flow requirements to produce velocity.
- Continue flushing operation for sufficient time to ensure thorough cleaning of pipe and until water flow is clear.

FIRE HYDRANTS

I. Personnel:

- One Fire Protection Systems Inspector
- One Contractor

II. Time Required:

- Thirty Minutes -Visual Inspections, Flush, and Flow Tests
- Two Hour and Fifteen Minutes – Hydrostatic Test

III. Pre-Test Conditions and Policies:

- All fire hydrants shall be pre-tested and the contractor shall provide a Contractor's Material and Test Certificate to the Fire Systems Inspector before the acceptance test is started.
- All approved site plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment shall be on site and available before the acceptance test is started. (Includes radios, hand tools, hoses, gauges etc.).
- If practical or necessary, contractor shall notify all affected parties and affected trades to ensure the appropriate trade representative is present during the witnessed test.
- All fire hydrants shall be hydrostatically tested in the presence of a Fire Systems Inspector.
- All fire hydrants shall be flushed in the presence of a Fire Systems Inspector with the appropriate documentation on site to confirm test results.
- The Fire Systems Inspectors shall not serve to develop a punch list.
- Failing fire hydrants may be assessed a re-inspection fee which shall be paid before any additional test.

III. Testing Procedure:

Visual Inspection

- Verify hydrant is located as shown on the approved site plans.
- Verify accessibility and devices to protect hydrant from damage (if required), are properly installed.
- Verify hydrant is the type specified and properly installed, including established grade, plumb, proper thread type (two) 2 ½ inch and (one) 4-inch (NSH) thread, size, orientation to the curb, markings, appropriate stabilization and attachment to other components.
- Verify there is no damage to the threads, bonnet, caps, stem nuts, and body of the hydrant.
- Verify hydrant is painted with the specified colors and pattern.

Operational Test

- Remove all nozzle caps and verify threads area clean, undamaged, lubricated and properly re-installed.
- Verify hydrant threads are the appropriate size and type with test caps.

- Verify hydrant-operating nut properly operates by fully opening and completely closing. (Open and close slowly to avoid water hammer condition).
- Verify hydrant gate control valve properly operates by fully opening and completely closing.
- Verify oil level by unscrewing one nozzle cap, tightening the others, opening the hydrant fully and tightening the loose cap once water starts to flow. Remove oil plugs and check oil level.
- Check all flange connections for leaks.
- Slowly close operating nut to fully closed position, remove one nozzle cap and place a hand over the opening. Drainage rate should be sufficiently rapid to create a noticeable suction. Examine the inside of the barrel to make certain drain valves have completely drained water from the barrel.

Flush

- Remove one nozzle cap, open hydrant fully, and flush barrel and hydrant lateral until water flows clean and with no signs of particulate matter.
- Slowly close the operating nut to the fully closed position, remove one nozzle cap and place a hand over the opening. The drainage rate should be sufficiently repaired to create a noticeable suction. Examine the inside of the barrel to make certain drain valves have completely drained water from the barrel.

Hydrostatic Test

- If only the hydrant is being hydrostatic tested, confirm the hydrant gate control valve is closed. Observe test gauges, rig, and connections for proper installation and record the water pressure that should not be less than 200 psi or 50 psi in excess of the maximum static pressure when the maximum static pressure is in excess of 150 psi for not less than two hours.
- Observe all points of connection for leaks, damage, or other conditions that could inhabit the operation of the pipe and hydrant.
- After two hours minimum, re-inspect all points of connection for leaks, damage, or other conditions that could inhabit the operation of the pipe or hydrant.
- Observe release of water pressure from the test rig and confirm the test gauge returns to zero psi.
- Observe operation of the street gate valve and confirm it is fully opened after the completion of the test.

Flow Test

- Remove 2-½ inch hydrant cap and connect test equipment to the outlet so that Pitot tube is pointed away from the water flow.
- Slowly open the hydrant to the full open position and flush until clear water is observed.
- Slowly and fully close hydrant and then turn Pitot tube to face the water stream.
- With the petcock open on the pitot gauge mounting tube, flush line 15 seconds or until a clear and unobstructed flow is observed.
- Close petcock and record gauge pressure from the flowing hydrant.
- Close the operating nut to the fully closed position, remove one nozzle cap and place a hand over the opening. Drainage rate should be sufficiently rapid to create a noticeable suction. Examine inside of barrel to make certain valves have completely drained water from the barrel.

- Remove test equipment and replace 2-½ inch cap on hydrant.

IV. Special Requirements:

- If any of the following installation criteria, operational objectives, inspections, or tests do not meet the requirements or standards, then the hydrant shall be placed out of service until such time the hydrant is brought into 100% compliance.

STANDPIPE SYSTEMS
All Testing Shall Conform to Chapter 9 of the 2015 VCC and NFPA 14 2013 Requirements

I. Personnel:

- Two Fire Protection Systems Inspectors
- Two Contractors

II. Time Required:

- Two Hours - Wet Standpipe / Roof Top Flow Test
- Two Hours and Thirty Minutes – Dry Standpipe Hydrostatic Test
- One Hour - Dry System Trip Test

III. Pre-Test Conditions and Policies:

- All standpipe systems shall be pre-tested and the contractor shall provide a Contractor's Material and Test Certificate for Aboveground Piping to the Fire Systems Inspector before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All hose valves and valve caps shall be in place. Note: If installed, all pressure reducing or regulating hose valves shall be confirmed for the elevation, tagged, and fitted with an external pressure regulating adjustment (override capabilities) for use by fire suppression personnel.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc.).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Systems Inspectors shall not serve to develop a punch list.
- Failing standpipe systems will be assessed a re-inspection fee of fifty dollars that shall be paid before any additional tests are conducted.
- Prior to connecting standpipe systems to main water supply, all underground mains and lead-in connections shall be flushed in the presence of a Fire Systems Inspector with the appropriate documentation on site to confirm test results. In addition, piping between fire department connection and the check valve in the inlet pipe shall be flushed prior to the completion of the system and prior to the installation of the fire department connection for above and below ground fire department connections.

- Prior to connecting standpipe systems to main water supply, all underground mains and lead-in connections shall be hydrostatically tested in the presence of a Fire Systems Inspector.

IV. Testing Procedure:

General

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- Visually inspect all system components to ensure appropriate materials, fittings, joining / support methods, and pipe dimensions are as specified in the approved plans.
- Verify all hose valves have external threads and 2-½ inch x 1 ½ inch reducing caps meeting National Hose Standard.
- Verify each fire department connection has at least two 2-½ inch internal threaded swivel fittings protected with caps or plugs meeting National Hose Standard.
- Verify that a permanently marked weather-resistant metal sign has been installed to clearly identify the use for the fire department connection.
- Verify fire department connection is not more than 100 feet from the nearest fire hydrant and is not less than 18 inches nor more than 42 inches above the level of the adjoining ground, sidewalk, or grade surface.
- Verify that a gauge or gauges are installed at the top of the standpipe riser and are controlled by a valve having an arrangement for draining.
- Verify each standpipe has a drain valve and piping located at the lowest point of the standpipe system so a means to drain is available.
- Verify each standpipe riser has a separate indicating control valve.
- If pressure control devices are required on standpipe hose valves, all hose valves shall be externally controlled or regulated. If pressures exceed 150 psi, a permanent sign shall be placed at each hose valve. Each pressure regulating hose valve shall be tagged with the testing requirements and floor location.
- If pressure reducing hose valves are installed on the standpipe system, all shall tested and pressure verified prior to installation.
- If pressure regulating devices are installed on the standpipe system, verify that permanent 3-inch drain risers with 3 inch x 2 ½ inch tee, internal threaded swivel fitting with National Hose Standard threads are provided adjacent to each standpipe.

Hydrostatic Test

- All standpipe systems including the fire department connection shall be hydrostatically tested for two hours at 200 psi or at 50 psi in excess of the maximum static pressure, whichever is greater.
- All hydrostatic pressure shall be measured at the low elevation point of the individual system or zone being tested. In addition, the pressure gauges at the top of each standpipe shall be observed and the pressure recorded.
- The standpipe piping shall not show any visible leakage or lose any pressure.
- At the completion of the hydrostatic test, the pressure shall be released, and all gauges shall return to zero.

Roof Top Flow Test

- All flow tests shall be conducted at the hydraulically most-remote outlet to determine compliance with the single-riser criteria.
- Flow tests shall be conducted in a safe manner and approved manner. If possible, no water should leave the roof.
- Pressure readings shall be taken at the pitot and on the riser gauge to determine flow and pressure.
- A maximum of 100 foot of hose shall be used for roof top flows.
- For a manual standpipe, a fire department pumper shall be used to verify the system design by pumping into the fire department connection. Contractor must notify the Code Enforcement Bureau of the need for the fire department pumper at least 7 days prior to the expected inspection or test date.

Dry Pipe Valve Trip Test

- For dry systems supplied through a dry pipe valve, a working test of all valves, quick-opening devices and air maintenance devices shall be made.
- Confirm dry pipe valve is ready for service and witness opening of most hydraulically remote hose valve.
- Witness dry system trip test and confirm water to the most remote hose outlet is delivered in not more than 60 seconds and that a minimum of 500 gallons per minute @ 65 psi is delivered within 3 minutes.
- Confirm air compressor size and the time required to repressurize the system with air after system is restored (no greater than 30 minutes, 60 minutes for low differential valves), is met.

Air Test

- Verify system air pressure is at 40 psi or the manufactures recommended pressure and all gauges and valves are sealed to prevent tampering.
- After 24 hours, verify system air test pressure has not dropped more than 1½ psi.
- Release air pressure from system and verify pressure gauges return to zero psi.

SPRINKLER SYSTEMS

All Testing Shall Conform to Chapter 9 of the 2015 VCC and NFPA 13 2013 Requirements

I. Personnel:

- One Fire Protection Systems Inspector – Per System
- One Contractor – Per System

II. Time Required:

- Two Hours and Fifteen Minutes Per System - Hydrostatic Test
- One Hour – Dry Valve Trip Test
- Fifteen Minutes to One Hour Final and Visual Inspections

III. Pre-Test Conditions and Policies:

- All sprinkler systems shall be pre-tested and the contractor shall provide a Certificate of Completion to the Fire Systems Inspector before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Systems Inspectors shall not serve to develop a punch list.
- Failing sprinkler systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.
- Prior to connecting sprinkler systems to main water supply, all underground mains and lead-in connections shall be flushed in the presence of a Fire Protection Systems Inspector with the appropriate documentation on site to confirm test results. In addition, piping between fire department connection and the check valve in the inlet pipe shall be flushed prior to the completion of the system and prior to the installation of the fire department connection for above and below ground fire department connections.
- Prior to connecting sprinkler systems to main water supply, all underground mains and lead-in connections shall be hydrostatically tested in the presence of a Fire Systems Inspector.

IV. Testing Procedure:

General

- Prior to beginning the test, all Fire Systems Protection Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.

Visual Inspection

- Visually inspect all system components to ensure appropriate materials, fittings, joining / support methods, pipe dimensions and locations are as specified in the approved plans.
- Verify sprinkler head coverage and spacing, correct temperature, and correct type of head has been installed.
- Check for conditions not clearly indicated on plans that could compromise sprinkler head coverage such as columns, beams, girders, bar joists, truss webs, light fixtures, displays, furniture, moveable walls, soffits, ductwork and bulkheads.
- Confirm that no other items, systems, materials, or components are attached or supported by the sprinkler piping.
- If used, note locations of test blanks and plugs on approved plans and inspection report.
- Verify all identification signs for control valves and operational valves are permanently attached indicating function and what is controlled.
- Verify each fire department connection has at least two 2-½ inch internal threaded swivel fittings protected with caps or plugs meeting National Hose Standard.
- Verify that a permanently marked weather-resistant metal sign has been installed to clearly identify the use for the fire department connection.
- Verify fire department connection is not more than 100 feet from the nearest fire hydrant and is not less than 18 inches nor more than 42 inches above the level of the adjoining ground, sidewalk, or grade surface.
- Verify the contractor has provided and installed hydraulic design information signs at the alarm, dry, deluge, or pre-action valve that are permanently marked, weatherproof, metal, and secured with corrosion-resistant wire, chain, or other approved means.

Hydrostatic Test

- All sprinkler systems including the fire department connection shall be hydrostatically tested for two hours at 200 psi or at 50 psi in excess of the maximum static pressure, whichever is greater. *This test will be performed prior to any pipe concealment (drywall, ACC, painting, burying, etc.)*
- All hydrostatic pressure shall be measured by a gauge at the low elevation point of the individual system or zone being tested.
- The sprinkler piping shall not show any visible leakage or lose any pressure.
- At the completion of the hydrostatic test, the pressure shall be released and all gauges shall return to zero.

Main Drain Test

- Flow water from the main drain to ensure an adequate and unobstructed water supply.
- Record static and residual pressure readings for future reference.

- Verify system drains are piped to an exterior location or interior drain that can handle the discharge of water in a manner that will not cause flooding or damage at the location of discharge.

Dry Pipe Valve Trip Test

- For dry systems supplied through a dry pipe valve, a working test of all valves, quick-opening devices and air maintenance devices shall be made.
- Confirm dry pipe valve is ready for service and witness opening of most hydraulically remote inspectors test valve.
- Witness dry system trip test and confirm water to the most remote hose outlet is delivered in not more than 60 seconds.
- Confirm air compressor size and the time required to re-pressurize the system with air after system is restored (no greater than 30 minutes, 60 minutes for low differential valves), is met.

Air Test

- Verify system air pressure is at 40 psi or the manufactures recommended pressure and all gauges and valves are sealed to prevent tampering.
- After 24 hours, verify system air test pressure has not dropped more than 1½ psi.
- Release air pressure from system and verify pressure gauges return to zero psi.

V. Special Requirements:

- One inspector per system shall be assigned to each floor/system. Multiple floors and / or systems shall not be tested at the same time, by the same inspector.
- One pressure gauge per system. No multiple systems on a single gauge.
- All system drains and inspectors test points shall be piped in such a manner to discharge to the exterior of a building or to an internal drain capable to handling the maximum flow of discharge so not to cause flooding or damage at the location of discharge.

FIRE PUMP SYSTEMS

All Testing Shall Conform to Chapter 9 of the 2015 VCC and NFPA 20 2013 Requirements

I. Personnel:

- Two Fire Protection Systems Inspectors
- Two Contractors
- One Manufacturers Representative
- One Electrician

II. Time Required:

- Two Hours Per Pump

V. Pre-Test Conditions and Policies:

- All fire pump systems shall be pre-tested and the contractor shall provide a Certificate of Completion and Test to the Fire Systems Inspector before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- Prior to connecting the fire pump system to main water supply, all underground mains and lead-in connections shall be flushed in the presence of a Fire Systems Inspector with the appropriate documentation on site to confirm test results. In addition, piping between fire department connection and the check valve in the inlet pipe shall be flushed prior to the completion of the system and prior to the installation of the fire department connection including above and below ground fire department connections.
- Prior to connecting the fire pump system to main water supply, all underground mains and lead-in connections shall be hydrostatically tested in the presence of a Fire Systems Protection Inspector.
- The Manufacturer's representative shall be on site during the acceptance test and provide the certified pump curve to the Fire Systems Inspector so it can be used to evaluate the pumps performance.
- Prior to the start of the acceptance test, the electrical or mechanical inspector shall approve all electrical and mechanical systems.
- For every 250 gallons of designed flow, one test valve shall be installed on the fire pump test header.
- The fire pump shall be tested at minimum (no flow), rated (100%), and peak (150%) loads.

- The Fire Protection Systems Inspector shall not serve to develop a punch list.
- Failing fire pump systems may be assessed a re-inspection fee , which shall be paid before any additional test.

VI. Testing Procedure:

General

- Prior to beginning of the acceptance test, all Fire Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.

Visual Inspection
(*Verify all required electrical inspections have been performed before any flow testing of fire pump will be allowed.)*

- Visually inspect all system components and accessories to ensure appropriate materials, fittings, joining / support methods, pipe dimensions and locations are as specified in the approved plans.
- Verify all identification signs for control valves and operational valves are permanently attached indicating function and what is controlled.
- Verify the hydraulic data plate is attached, permanently marked, constructed of weatherproof metal, and secured with corrosion-resistant fasteners or other approved means.
- Verify pump size and compatibility of controller equipment against that of the pump.
- Verify the pump room has adequate heat, proper drainage and sufficient lighting.

Hydrostatic Test

- All fire pump system piping (suction and discharge) shall be hydrostatically tested for two hours at 200 psi or at 50 psi in excess of the maximum static pressure, whichever is greater.
- The sprinkler piping shall not show any visible leakage or lose any pressure.
- At the completion of the hydrostatic test, the pressure shall be released and all gauges shall return to zero.

Flush

- Suction piping shall be flushed at a flow rate not less than the hydraulically calculated water demand rate of the system or at a flow rate as specified in NFPA 20, whichever is greater. Flushing should take place prior to connection of fire pump to suction piping but flushing through the fire pump test manifold will be considered if circumstances dictate.

Flow Acceptance Test

- Verify water discharge from the fire pump has stabilized and immediately thereafter, measure the operating conditions of the fire pump and driver.
- Manufacturer or installer shall obtain and record the following: pump rpms, motor amperage (electric drivers only), suction pressure, discharge pressure, and GPM flow at 0% (no flow), 100% of rated capacity, and 150% of rated capacity. amperage, voltage, and rpms.

- Continuously monitor suction pressure reading to ensure a minimum residual pressure of 20 psi (Old Town Area)/10-psi (Rest of C.O.A.) or higher is maintained at all times. Test shall be stopped at any point this is not maintained. Verify the fire pump and motor do not overheat during the test or flow of water.
- Verify fire pump and controller automatically shut down after no less than 10 minutes.
- Fire pump operation shall be tested under normal power, for automatic transfer, and under emergency power / back up power.
- Verify fire pump and fire alarm interconnection and annunciation.
- Fire pump and fire pump controller shall be tested for a minimum of three automatic and three manual start and stops sequences.
- Verify casing relief and pressure relief valves are operating properly.
- Fire Pump test will not be considered complete until receipt of Fire Pump Test Report by the City of Alexandria Fire Protection Systems Inspector.

Electric Drivers

- Verify protection of the electrical cable for the fire pump.
- Verify circuit breaker for proper rating.
- Verify minimum run time setting on controller where installed.
- Witness and verify transfer from normal power to emergency power.

Diesel Fire Pumps

- Verify all components for the fuel supply installed properly. (Includes tank, tank Fill, vent piping, and fire pump supply and return lines)
- Verify batteries are properly mounted, secured, and charged.
- Verify there is a block heater on the engine.
- Witness a failure-to-start sequence.
- Witness a cold start of the diesel engine.
- Check the exhaust system for proper pipe size, appropriate flexible connection, and proper location for exhaust discharge.
- Check the discharge piping on the engine coolant bypass and make sure it is the same size as provided on the pump and discharges to a floor drain.
- Witness an over speed test and verify if a warning bell sounds and the pump stops.
- Check the relief valve setting and verify that it relives if the pump operates above normal speed.
- Verify the automatic operation of the diesel driver during the fire pump test.

FOAM SYSTEMS

All Testing Shall Conform to Chapter 9 of the 2015 VCC and NFPA 11 and 16 Requirements

I. Personnel:

- Two Fire Protection Systems Inspectors – Per System
- Two Contractors – Per System
- One Manufactures Representative
- One Fire Alarm Technician – Per System

II. Time Required:

- Two Hours and Fifteen Minutes Per System - Hydrostatic Test
- One Hour Per System - Visual Inspection
- One Hour Per System - Dry / Deluge Valve Trip Test
- Two Hours Per System - Fire Alarm and Final Inspection

III. Pre-Test Conditions and Policies:

- All foam systems shall be pre-tested and the contractor shall provide a Certificate of Completion to the Fire Systems Protection Inspectors before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspectors before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc.).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.
- Failing foam systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.
- Prior to connecting foam systems to main water supply, all underground mains and lead-in connections shall be flushed in the presence of a Fire Systems Inspector with the appropriate documentation on site to confirm test results. In addition, piping between fire department connection and the check valve in the inlet pipe shall be flushed prior to the completion of the system and prior to the installation of the fire department connection.
- Prior to connecting foam systems to main water supply, all underground mains and lead-in connections shall be hydrostatically tested in the presence of a Fire Systems Inspector.
- All foam system piping shall be flushed after installation using the systems normal water supply with foam-forming materials shut-off, (unless the hazard cannot be subjected to water flow), in the presence of the Fire Protection Systems Inspector. Where flushing

cannot be performed, the interior of the pipe shall be visually examined for cleanliness and made clean if not.

IV. Testing Procedure:

General

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.

Visual Inspection

- Visually inspect all above ground and below ground system components to ensure appropriate materials, fittings, joining / support methods, pipe dimensions and locations are as specified in the approved plans.
- Verify nozzle or head coverage and spacing, and correct type of nozzle or head has been installed.
- Check for conditions not clearly indicated on plans that could compromise nozzle or head coverage such as columns, beams, girders, bar joists, truss webs, light fixtures, soffits, ductwork and bulkheads.
- Confirm that no other items, systems, materials, or components are attached or supported by the piping.
- If used, note locations of test blanks, plugs, or blinds on approved plans and inspection report and ensure they are removed at the completion of the inspection and test.
- Inspect all proportioning devices, accessory equipment, and tanks or storage container for proper installation.
- Inspect all valve locations, control, gauges, vapor seals for accessibility and proper installation.
- Verify all fixed discharge outlets equipped with frangible seals are accessible for inspection and maintenance.
- Verify all strainers are clean and properly positioned.
- Verify all identification signs for control valves and operational valves are permanently attached indicating function and what is controlled.
- Verify all warning signs are permanently attached and visible to personnel who could be in contact with the foam products.
- Verify each fire department connection has at least two 2½-inch internal threaded swivel fittings protected with caps or plugs meeting National Hose Standard.
- Verify that a permanently marked weather-resistant metal sign has been installed to clearly identify the use for the fire department connection.
- Verify fire department connection is not more than 100 feet from the nearest fire hydrant and is not less than 18 inches nor more than 42 inches above the level of the adjoining ground, sidewalk, or grade surface.
- Verify the contractor has provided and installed hydraulic design information signs at the alarm, dry, deluge, or pre-action valve that are permanently marked, weatherproof, metal, and secured with corrosion-resistant wire, chain, or other approved means.
- Verify all normally dry horizontally piping is correctly pitched for proper drainage.

Main Drain Test

- Flow water from the main drain to ensure an adequate and unobstructed water supply.
- Record static and residual pressure readings for future reference.
- Verify system drains are piped to an exterior location or interior drain that can handle the discharge of water in a manner that will not cause flooding or damage at the location of discharge.

Hydrostatic Test

- All foam system piping including the fire department connection and except piping handling expanded foam for other than subsurface application, shall be hydrostatically tested for two hours at 200 psi or at 50 psi in excess of the maximum static pressure, whichever is greater.
- All hydrostatic pressure shall be measured by a gauge at the low elevation point of the individual system or zone being tested.
- The foam system piping shall not show any visible leakage or lose any pressure.
- At the completion of the hydrostatic test, the pressure shall be released and all gauges shall return to zero.

Operations Test

- For systems supplied through a dry pipe / deluge valve, confirm all operating devices and equipment including dry pipe / deluge valve is ready for service and witness operation for proper function.
- Verify all

Discharge Test

- Where conditions permit, witness the flow test of all systems to ensure the hazard is fully protected as specified in the design.
- Record the following data for review and verification: Static water pressure, residual water pressure at the control valve, and at the remote reference point in the system. Actual discharge rate, Consumption rate of foam-producing material, Foam quality (expansion and ¼ drain time) or foam discharge shall be conducted, or the form discharge shall be visually inspected to ensure that it is satisfactory for the purpose intended.
- Foam Concentration shall have on of the following proportions: Not less than the rated concentration. No more than 30 percent above the rated concentrate, or 1% point above the rated concentration (whichever is less)
- After completion of acceptance tests, the system shall be flushed and restored to operational condition

WET AND DRY CHEMICAL SUPPRESSION SYSTEMS
All Testing Shall Conform to NFPA 17A, 2013 Requirements

I. Personnel:

- One Fire Protection Systems Inspector
- One Contractor
- One Mechanical
- One Plumbing Contractor

II. Time Required:

- One Hour – Per System

III. Pre-Testing Conditions and Policies:

- Prior to the start of the inspection and test, all tanks, manual pull stations, nozzles, and fusible links shall be in place.
- Prior to the start of the inspection and test, all associated mechanical systems, duct work, and clean outs shall be installed and approved by the mechanical inspector.
- Prior to the start of the inspection and test, all associated cooking appliances shall be in place and approved by the plumbing inspector.
- All hood suppression systems shall be pre-tested and the contractor shall provide a Certificate of Completion to the Fire Protection Systems Inspector before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspector before the acceptance test is started.
- All systems shall be tested through automatic and manual means to ensure proper operation of the suppression system.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.
- Failing hood suppression systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

General

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.

Visual Inspection

- Visually inspect all system components to ensure appropriate materials, fittings, joining / support methods, pipe dimensions and locations are as specified in the approved plans.
- Verify location of all associated mechanical systems and cooking appliances and check for conditions not clearly indicated on plans that could compromise nozzle coverage.
- Verify appliances are as specified in approved plans and confirm all appliance dimensions.
- Verify coverage, height, spacing, and correct type of nozzle has been installed.
- Verify location of manual pull station, fusible links, control panels, and tanks to ensure no condition exists that could interfere with the proper operation of the suppression system.
- Verify manual pull station, control valves, and operational valves are properly identified with the appropriate signage permanently attached indicating function and what is controlled.
- Verify fusible links are the appropriate temperature and type.
- Verify the suppression system bears the label of an approved agency

Performance Test

- Secure receptacles at each discharge nozzle to gather discharge product.
- Turn on all appliance utilities, under the protective hood system and place exhaust fans in normal ("on") position.
- Activate hood suppression system by activating an automatic fusible link.
- Upon completion of testing discharge, measure captured air and determine if a enough amount has been expelled.
- Verify all utilities (fuel and power) shut off upon activation of suppression system.
- Verify appropriate exhaust fan operation and make-up air.
- Verify operation of alarm device(s) upon activation of hood suppression system.
- Reset hood suppression system and place all systems and appliances in normal operational condition.
- Repeat test using the manual pull station and confirm functional operation of suppression system, utilities, and mechanical systems.
- At the conclusion of all inspection and testing, ensure systems have been restored to normal ready service.

V. Special Requirements:

- All multiple suppression systems shall be appropriately identified and permanently labeled.

- Provide an audio/visual fire alarm device attached to system if there is no building fire alarm system available.
- Where persons will be exposed to a system discharge, warning signs and discharge alarms shall be provided.

GAS-BASED SUPPRESSION SYSTEMS

All Testing Shall Conform to the 2015 VCC and NFPA 2001 Requirements

I. Personnel:

- One Fire Protection Systems Inspector
- One Contractor
- One Mechanical Contractor
- One Electrical Contractor

II. Time Required:

- One Hour – Per System

III. Pre-Testing Conditions and Policies:

- Prior to the start of the inspection and test, all tanks, manual emergency release, nozzles, piping, fusible links, or other automatic release devices shall be in place.
- Prior to the start of the inspection and test, all associated mechanical and electrical systems shall be installed and approved by the appropriate inspector.
- All suppression systems shall be pre-tested and the contractor shall provide a Certificate of Completion to the Fire Systems Inspector before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspectors before the acceptance test is started.
- All systems shall be tested through automatic and manual means to ensure proper operation of the suppression system.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Systems Inspectors shall not serve to develop a punch list.
- Failing suppression systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

General

- Prior to beginning the test, all Fire Protection System Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.

Visual Inspection

- Visually inspect all system components to ensure appropriate materials, fittings, joining / support methods, pipe dimensions and locations are as specified in the approved plans.
- Verify location of all associated mechanical, electrical, and fire detection system devices and check for conditions not clearly indicated on plans that could compromise nozzle coverage.
- Verify installation and devices are as specified in approved plans and confirm all conditions and configurations closely inspecting for unclosable openings and sources of agent loss.
- Verify coverage, height, spacing, size, and correct type of nozzle has been installed.
- Verify all fire detection system devices are the correct type and in the correct location.
- Verify location of manual emergency release, fusible links, operating devices, control panels, and tanks to ensure no condition exists that could interfere with the proper operation of the suppression system.
- Verify manual emergency release, control valves, and operational valves are properly identified with the appropriate signage permanently attached indicating function and what is controlled.
- Verify nameplate data on the storage containers are as specified.
- Verify fusible link is the appropriate temperature and type.
- Verify the suppression system bears the label of an approved agency.

Performance Test

- Witness local application test of a full system discharge via automatic means.
- Verify design quantity to ensure effective coverage of the hazard for the full period required by the design calculations.
- Verify all pressure-operated devices function as intended.
- Verify operation of alarm device(s) upon activation of suppression system.
- Reset suppression system and place all systems in normal operational condition.
- Witness total flooding test of a full system using the manual emergency release and confirm functional operation of suppression system to ensure effective coverage of the hazard for the full period of time required by the design calculations.
- Note: Manufacture's approved "test agents" shall be permitted in lieu of the actual agent if approved by the Director of Code Administration or designee.

V. Special Requirements:

- All multiple suppression systems shall be appropriately identified and permanently labeled.
- Provide an audio/visual fire alarm device attached to system if there is fire alarm system available.
- Where persons will be exposed to a system discharge, warning signs and discharge alarms shall be provided.

SMOKE CONTROL SYSTEMS
All Testing Shall Conform to the 2015 VCC Chapter 9 Requirements

I. Personnel:

- Two Fire Protection Systems Inspectors
- Two Contractors

II. Time Required:

- One Hour for Small Spaces – Spaces Less Than 60000 Cubic Feet
- Two Hours for Large Spaces – Spaces Greater Than 60000 Cubic Feet

III. Pre-Testing Conditions and Policies:

- Prior to the start of the inspection and test, all associated mechanical (including stairwell pressurization), electrical, and fire protection systems shall be installed and approved by the appropriate inspector.
- All smoke control systems shall be pre-tested and the contractor shall provide a certified Certificate of Completion and Operation stamped by a licensed professional fire protection or mechanical engineer to the Fire Systems Inspector before the acceptance test is started. The system certification report shall include the following items:
    1. Identify type(s) of smoke control activation signals(s), such a sprinkler waterflow, smoke detection, manual, etc., and associated smoke control system operation(s) that are activated by the signals.
    2. Identify building area(s) where maximum mechanical exhaust to the outside is implemented and supply air is not provided.
    3. Identify building area(s) where maximum air supply is implemented and exhaust to the outside is not provided.
    4. Identify fan(s), which shall be "On" as required to implement the smoke control system. If multiple-speed fans are used, the capacity at which the fans shall operate in the smoke control mode shall be identified.
    5. Identify fan(s), which shall be "off" as required to implement the smoke control system.
    6. Identify damper(s), which shall be "open" to implement he smoke control system.
    7. Identify smoke evacuation zones, footage, and calculating the volume of air exchange.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspector before the acceptance test is started.
- All systems shall be tested through automatic and manual means to ensure proper operation of the smoke control system.
- All doors to offices, stairways, and other rooms shall be in their normal position (closed).
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke generators, ample generating fluid. hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc.).

- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.
- Failing smoke control systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

- Verify all building smoke control, fire alarm, mechanical and electrical systems equipment are in the normal operating mode.
- Verify artificial smoke generators are in the center of the smoke zone. (In extremely large smoke zones, Inspectors shall be strategically placing the artificial smoke generators for optimum performance)
- Smoke generators shall be turned on.
- Verify artificial smoke has completely filled the smoke zone. (If a fire alarm device activates prior to the smoke zone being completely filled, the smoke control system shall be allowed to function in a normal condition).
- Verify that each initiating device, fan, damper and other required equipment is operational and performs to the limits and capacity required.
- Verify that correct control outputs are produced for a given control input for each control sequence specified by the system operation report.
- If standby power is required for the operation of the smoke control system, verify proper operation on both normal building power and back up power.
- Verify that the smoke heat vent is capable of being opened in a manner that does not require destructive testing.
- Once the artificial smoke is completely evacuated, normal electrical power shall be removed from the smoke control system. Secondary power (generators) shall be activated to supply emergency power.
- The artificial smoke generators shall be started a second time.
- Manual smoke controls shall be operated to prevent premature smoke evacuation. Once the artificial smoke has completely filled the smoke zone, manual override controls shall be activated to remove the artificial smoke.
- Verify egress lighting and signs are visible for at least 10 minutes.
- Approximately 90 percent of the artificial smoke shall be evacuated within 20 minutes.
- A trained representative or professional engineer who possesses the knowledge, tools, and means to measure the volume of air being exhausted through the smoke evacuation system during operations and who will verify the calculations and performance on site.

STAIRWELL PRESSURIZATION SYSTEMS

All Testing Shall Conform to Chapter 9 Of the 2015 VCC Requirements

I. Personnel:

- Two Fire Protection Systems Inspectors
- Two Contractors

II. Time Required:

- One Hour

III. Pre-Testing Conditions and Policies:

- Prior to the start of the inspection and test, all associated mechanical, electrical, and fire protection systems shall be installed and approved by the appropriate inspector.
- All stairwell pressurization systems shall be pre-tested and the contractor shall provide a certified Certificate of Completion and Operation stamped by a licensed professional fire protection or mechanical engineer to the Fire Systems Inspector before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspector before the acceptance test is started.
- All systems shall be tested through automatic and manual means to ensure proper operation of the stairwell pressurization system.
- All doors to offices, stairways, and other rooms shall be in their normal position (closed) and installed with approved closure devices and hardware.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke generators, ample generating fluid. hand tools, hoses, barrels, gauges, ladders, keys, pass cards, etc.).
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Contractor shall coordinate the test with all other affected trades (e.g. alarm, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.
- Failing smoke control systems will be assessed a re-inspection fee that shall be paid before any additional tests are conducted.

IV. Testing Procedure:

- Verify all stair doors in the closed position. (All door shall be pretested to verify opening force of 15 pounds to start and not exceed 30lbs of pressure as outlined in the 2015 VCC Section 1010.1.3)
- Verify manual activation of pressurization system under normal and emergency power.
- Record a minimum of three stairway readings in each stair tower (top, middle and bottom). Note: All pressure shall be between 0.15 inches of water and a maximum of 0.35 inches of water.

- Verify stairway doors operate properly by ensuring they open and close under pressure.
- If a stairway extension / corridor exists, the pressure shall also be checked in the corridor.
- Repeat pressurization test by automatic activation under normal and emergency power. Note: All pressure shall be between 0.15 inches of water and a maximum of 0.35 inches of water.
- Stair Pressurization test will not be considered complete until receipt of Test Report by the City of Alexandria Fire Protection Systems Inspector

DOOR LOCKING SYSTEMS

All Testing Shall Conform to Chapter 10 Of the 2015 VCC Requirements

I. Personnel:

- One Fire Protection Systems Inspector
- One Contractor

II. Time Required:

- Thirty Minutes

III. Pre-Test Conditions and Policies:

- All access control devices shall be pre-tested by the contractor before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Systems Inspector before the acceptance test is started.
- All test equipment, building access devices shall be on site, and available before the acceptance test is started. (Includes radios, smoke, hand tools, hoses, manometers, sound pressure level meter, multi-meter, heat gun, ladders, lifts, keys, pass cards, etc).
- All required Digital Alarm Communication Transmitters, phone lines, and Central or Remote Station signal receiving centers, circuits, and systems shall be in place, tested, and ready for service at least 24 hours prior to the start of the acceptance test if required.
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems and conspicuously post notices at all entrances and on all floors.
- Contractor shall coordinate the test with all other affected trades (e.g. sprinkler, elevator, mechanical, electrical), to ensure the appropriate trade representative is present during the witnessed test.
- Failing access control systems may be assessed a re-inspection fee that shall be paid before any additional tests are conducted.
- The Fire Protection Systems Inspectors shall not serve to develop a punch list.

V. Testing Procedure:

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- The Fire Protection Systems Inspector shall notify the Alexandria Fire Communications Center via radio or at 703-746-4444 to disregard all alarms and request the Communication Center notify the Fire Systems Inspector when the alarm signals are received.
- Once the Fire Systems Inspector is notified by the Alexandria Fire Communications Center, the contractor shall notify the central or remote station of the test and place the system in test mode.
- All new, replaced, and relocated access control system devices shall be visually inspected and operationally tested under actual operational conditions using the manufactures recommended procedures. All device types, locations, and functions shall be verified.

- If a new system and an existing system are interconnected, all existing devices known to be affected by the interconnection shall be tested through the new system.
- All Access Control Systems must conform to all requirements with the appropriate and approved code package, (Virginia Construction Code Section 1010).
- Access control devices shall be tested under normal power as directed by the Fire Protection Systems Inspector.
- All access control / electric door locking and release systems shall be tested under actual operational conditions.
- All elevator override and recall functions shall be tested under actual operational conditions.

PRESSURE REGULATING VALVE
All Testing Shall Conform to NFPA 14 2013 Requirements

III. Personnel:

- One Fire Protection Systems Inspector
- One Contractor

IV. Time Required:

- 15 minutes per valve

III. Pre-Test Conditions and Policies:

- All Pressure Regulating Valves shall be pre-tested by the contractor before the acceptance test is started.
- All approved plans, operation manuals, device specification sheets, and calculations shall be on site and available for review by the Fire Protection Systems Inspector before the acceptance test is started.
- Contractor shall notify all affected parties (e.g. building management and tenants), of the impending test to minimize disruption and to prevent interruption of any critical building systems.
- Prior to testing Pressure Regulating Valves, all piping shall be hydrostatically tested for two hours at 200 psi or at 50 psi in excess of the maximum static pressure, whichever is greater.

VI. Testing Procedure:

- Prior to beginning the test, all Fire Protection Systems Inspectors shall review all approved plans, operation manuals, device specification sheets, and calculations.
- The Fire Protection Systems Inspector shall notify the Alexandria Fire Communications Center via radio or at 703-746-4444 to disregard all alarms and request the Communication Center notify the Fire Protection Systems Inspector when the alarm signals are received.
- Once the Fire Protection Systems Inspector is notified by the Alexandria Fire Communications Center, the contractor shall notify the central or remote station of the test and place the system in test mode.
- Test will contain reading static and residual inlet pressures, static and residual outlet pressures and the flow rate.
- All pressure and flow readings shall be documented and provided to the building owner and the Department of Code Administration as a permanent record of device requirements. In addition, any tags or other factory information that is attached to pressure reducing /regulating devices shall be captured and retained for building owner's records.

REFERENCE

Introduction

Although the primary responsibility to manage construction activities falls to the City's Code Administration and Transportation and Environmental Services Departments, the Alexandria Fire Department's Fire Prevention and Life Safety Section (FPLS) frequently works with these agencies to ensure a safe environment. One of our main safety objectives is to evaluate job sites to ensure accessibility, order, and safety for the workers, occupants, inspectors, and fire department personnel should the need arise. In addition, FPLS members visit construction sites to ensure general fire prevention code requirements, some building code, and certain fire department related site plan requirements are being adhered to throughout the project.

To help all invested parities, the Alexandria Fire Department's Fire Prevention and Life Safety Section (FPLS) has put together this guide outlining some of the most commonly and frequently missed fire, building, and site plan requirements that are associated with fire department activities at construction sites. Some of the requirements are for initial construction, others remain in place until the job is complete, and some are for the life of the building. The information covers issues that are not always obvious and do not seem important but failure to implement could delay work, stop work, or even cause injury or death.

Many of the requirements are directly from the building and fire codes while others are mandatory through the site plan process. Code citations are included for reference. However, not all may be applicable to the construction project so if there are any questions regarding what is required or a need for clarification, please contact the Fire Prevention and Life Safety (FPLS) Unit at 703-746-4256.

Definitions

Throughout this document, you will find *italicized* words that have a specific meaning. Should you encounter an *italicized* word, please refer to this section for the definition.

Approved – Acceptable to the building or fire official.

Building Height – The vertical distance from grade plane to the average height of the highest roof surface.

Building Official – The person or other designated authority charged with administration and enforcement of the building code.

CAFPC – City of Alexandria Fire Prevention Code

Fire Official – The officer or other designated authority charged with administration and enforcement of the fire code.

Flight - A continuous run of rectangular treads, winders or combination thereof from one landing to another.

Listed / Labeled – Equipment, materials, or products that have a label, seal, symbol, or other identifying mark of a nationally recognized testing laboratory, inspection agency, or other recognized organization that inspects the labeled items that meet identified standards or are tested and found suitable for a specified purpose.

Means of Egress – A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a *public way*. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

Public Way - A street, alley or other parcel of land open to the outside air leading to a street, that has been deeded, dedicated or otherwise permanently appropriated to the public for public use and which has a clear width and height of not less than 10 feet.

Owner - A corporation, firm, partnership, association, organization and any other group acting as a unit, or a person who has legal title to any structure or premises with or without accompanying actual possession thereof, and shall include the duly authorized agent or attorney, a purchaser, devisee, fiduciary and any person having a vested or contingent interest in the premises in question.

Stairway - One or more *flights* of *stairs*, either exterior or interior, with the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one level to another.

SFPC – Virginia Statewide Fire Prevention Code

USBC – Virginia Uniform Statewide Building Code

General Requirements

The General Requirements section outlines many of the common hazards associated with a construction site. In this section, you will find information about the different processes and hazards but in some cases, there may be additional requirements not noted in this document. Therefore, it is the responsibility of the individual or company to perform their due diligence to ensure compliance. Most of these requirements are directly out of the fire prevention code and are basic, common sense issues but sometimes they are overlooked or not given proper attention. Contact the FPLS Unit if you have questions.

Fire Prevention Program Superintendent (CAFPC / VSFP Section 3308)

It is the *owner's* responsibility to designate a person to be the fire prevention program superintendent. The superintendent shall be responsible for the fire prevention program and ensure that it is carried out through completion of the project. The fire prevention program superintendent shall have the authority to enforce the provisions of the requirements contained within this document and other provisions as necessary to ensure a safe environment. Where guard service is provided, the superintendent shall be responsible for the guard service.

The fire prevention program superintendent shall develop and maintain an *approved* prefire plan in cooperation with the *fire official*. It is recommended that the plan including a site map, site contact information, evacuation plan, meeting point, type, quantity, and location of any hazardous materials, FDC location, and any other relevant information. It is recommended that the information be stored in a 4-inch weather tight PVC pipe painted red marked "Fire Department" located at the entrance to the site where it is readily visible and accessible. The *fire code official* shall be notified of changes affecting the utilization of information contained in such prefire plans.

Training of responsible personnel in the use of fire protection equipment (ex: fire hydrants and fire extinguishers) shall be the responsibility of the fire prevention program superintendent. The fire prevention program superintendent shall determine that all fire protection equipment is maintained and serviced in accordance with the City fire prevention code. The quantity and type of fire protection equipment shall be *approved***.**

The fire prevention program superintendent shall be responsible for supervising the permit system for hot work operations as required in the fire prevention code.

Building Address (CAFPC / SFPC Section 505)

As soon as construction starts, the site or building address shall be posted at the entrance to site. If site access is not located at the address side of the construction, a sign shall be posted to indicate where access to the site is available. As construction progresses and the building or buildings are erected, the building address shall be posted on the building. It is permissible for the posted addresses to be temporary but they must be the permanent, approved sign for the building final and occupancy inspection. Also, as soon as the permanently assigned address is known, it should be utilized and posted to avoid problems with emergency response and fire protection system monitoring.

Site Access (CAFPC / SFPC Section 3310)

Approved fire apparatus access roadways for firefighting and medical emergencies shall be provided to all construction or demolition sites. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.

Where sites are protected by fencing and gates, access to the site shall be provided either by a Knox® Padlock Model Number 3770 keyed to the Alexandria Fire Department pattern or a Knox Box® (any Model 3200 series) installed at the gate entrance with the contractor's padlock key or access device inside the box.

Site Management (USBC Section 3308)

Construction materials, equipment, fences, sheds or obstruction of any kind shall not be placed or stored so as to obstruct access to fire hydrants, fire department connection, standpipes, utility pole, fire or police alarm boxes, catch basins or manholes, nor shall such material or equipment be located within 20 feet of a street intersection, placed so as to obstruct normal observations of traffic signals, traffic signs, hinder the use of public transit loading platforms, or interfere with the passage of water in the gutter. Protection against damage shall be provided to such utility fixtures during the progress of the work, but sight of them shall not be obstructed.

Water Supply for Firefighting and Fire Protection (USBC Section 3313 - CAFPC /SFPC Section 3312)

An *approved* water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible material arrives on the site.

Means of Egress and Means of Egress Stairways (USBC Section 3310 - CAFPC / SFPC 3311)

Required means of egress shall be maintained at all times during construction, demolition, remodeling, or alterations and additions to any building.

Where a building has been constructed to a *building height* of 50 feet or four stories, or where an existing building exceeding 50 feet in *building height* is altered, at least one temporary lighted *stairway* shall be provided unless one or more of the permanent *stairways* are erected as the construction progresses. Required *means of egress* shall be maintained during construction and demolition, remodeling or alterations and additions to any building.

Smoking (CAFPC / SFPC Section 3304)

Smoking shall be prohibited except in *approved* areas. "No Smoking" signs shall be posted in

conspicuous locations throughout the structure. In *approved* areas where smoking is permitted, *approved* non-combustible ash trays or receptacles shall be provided.

Waste Disposal (USBC Section 3302 - CAFPC - SFPC Section 3304)

Combustible debris shall not be accumulated within buildings. Combustible debris, rubbish, and waste material shall be removed from buildings at the end of each shift of work. Combustible debris, rubbish, and waste material shall not be disposed of by burning.

Open Burning (CAFPC /SFPC Section 307)

Unless sanctioned by the *fire official* and the Department of Environmental Quality, open burning of any material is prohibited. If sanctioned, a fire prevention permit is required.

Spontaneous Ignition Materials (CAFPC/SFPC Sections 305 and 3304)

Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a *listed* disposal container.

Cutting, Welding, and Hot Works (CAFPC / SFPC Sections 3304 and 3504)

Any operation involving cutting, welding, and hot works requires a fire prevention permit and shall be performed in a clean area, shall not be performed around combustible or flammable materials, or near opening or cracks that could allow the passage of sparks or embers into adjacent areas. In addition, a minimum 2-A:20-B:C fire extinguisher shall be readily accessible within 30 feet of where the cutting, welding, and hot work is performed.

Fire Extinguishers (USBC Section 3309 – CAFPC / SFPC Section 3315)

Structures under construction, alteration, or demolition shall be provided with not less than one *approved* portable fire extinguisher. The fire extinguisher shall be the appropriate type for the materials, environment, and hazard, and appropriately sized for not less than ordinary hazard conditions. The minimum placement of the fire extinguishers is as follows:

- At each stairway on all floor levels where combustible materials have accumulated.
- In every storage and construction shed.
- Additional portable fire extinguishers shall be provided where special hazards exist including, but not limited to, the storage and use of flammable and combustible liquids.

Temporary Heating Equipment (CAFPC / SFPC Section 3303)

Fuel or gas fed temporary heating devices require a fire prevention permit and shall be *listed*, *labeled,* installed, maintained, and used in accordance with the terms of their listing or labeling. Clearance to combustibles from temporary heating devices shall be maintained in accordance with the *listed* / *labeled* equipment. When in operation, temporary heating devices shall be fixed in place and protected from damage, dislodgement, or overturning in accordance with the manufacturer's instructions.

Temporary Lighting (CAFPC / SFPC Section 3304)

Temporary lighting shall be installed in all work areas as soon as is practicable and shall comply with NFPA 70.

Flammable and Combustion Liquids (CAFPC / SFPC Section 3305)

The storage, use, and handling of flammable and combustible liquids at construction sites shall be in accordance with requirements found in the Virginia Statewide and City of Alexandria Fire Prevention Codes, Chapter 57.

Flammable and combustible liquid storage areas shall be maintained clear of combustible vegetation and waste materials. Such storage areas shall not be used for the storage of combustible materials. Class I and II liquids shall be kept in *approved* safety containers. Leaking vessels shall be immediately repaired or taken out of service and spills shall be cleaned up and disposed of properly.

Flammable Gases (CAFPC / SFPC Section 3306)

The storage, use, and handling of flammable gases at construction sites shall be in accordance with requirements found in the Virginia Statewide and City of Alexandria Fire Prevention Codes, Chapter 58.

Motorized Construction Equipment (CAFPC / SFPC Section 3316)

Internal-combustion-powered construction equipment shall be used in accordance with all the following conditions:

1. Equipment shall be located so that exhausts do not discharge against combustible material.
2. Exhausts shall be piped to the outside of the building.
3. Equipment shall not be refueled while in operation.
4. Fuel for equipment shall be stored in an *approved* area outside of the building.

Fire Prevention Permit Requirements (CAFPC Table 107.2)

There are many activities and conditions that require the general contractor or their subcontractors to apply for fire prevention permits. In addition, once the construction is near completion, there may be a need for the owner or occupant to obtain a fire prevention permit based on the use, a process, or a hazard.

Apply for a fire prevention permit in person at the Code Administration Office, 301 King Street, Suite 4200 or on-line by accessing the City of Alexandria webpage; *Government; Department and Agencies; Code Administration; Permit Center; Permit Center Process; Applications and Forms; Fire Prevention Permit Application* to access a pdf version of the application.

The following is a list of the most commonly required fire prevention permits related to construction. The second list is other fire prevention permits that might be required once a building is occupied.

Not all construction sites will have the need for all the listed permits but there will be situations that require the contractor to obtain a fire prevention permit that is not on the list. Some permits are needed at the beginning of the project, some are required throughout the project, and some will stay in place once the building is completed. If there are any questions, please contact the FPLC office.

Construction Related Fire Prevention Permits

Asphalt Kettles
Compressed Gas – Storage, Use, Handling
Corrosives – Storage, Use, Handling
Cutting, Welding, Hot Works, Sweating Pipe, Heat Guns, Open Flame
Explosives
Explosive Vehicle
Fire Hydrant Use
Flammable and Combustible liquids
Flammable Gases
Flammable Solids
Flammable Finish Application
Hazardous Materials
LP Gas – Storage, Use Inside and Outside
Open Burning

Occupancy/Use/Process/Hazard Related Fire Prevention Permits

Assembly
Education
Battery Systems
Combustible Dust

Combustible Fibers
Cryogenic Fluids
Dry Cleaning Plants
Indoor Exhibits, Trade Shows, and Special Amusement and Assembly Events
Highly Toxic Materials
High-piled Storage
Indoor Display of Vehicles or Equipment
Indoor Pyrotechnics
Industrial Ovens
Lumber Yards and wood working plants
Liquid and Gas Fueled Vehicles in Assembly Buildings
Combustible Storage
Organic Coating
Organic Peroxides
Oxidizers
Pyrophoric Materials
Pyroxylin Plastics
Repair Garage, Service Stations, Motor Fuel Dispensing Facilities
Spray / Dipping of Flammable Finishes (Includes Exterior Spraying Areas)
Scrap Tire and By-products Storage / Tire Rebuilding
Temporary Membrane Structures
Unstable Materials
Waste Material and Junk Yards

Fire Hydrant Use Requirements (CAFPC Section 4-2-18)

To use any public or private fire hydrant in the City of Alexandria, you must obtain a Fire Prevention Permit from the Alexandria Fire Department's Fire Prevention and Life Safety Section. In addition, the applicant must obtain and install a hydrant meter provided by the Virginia American Water Company. Virginia American Water Company (VAWC) hydrant meters are identified by a tag as shown in the picture **(Figure 1)**. Use of another water company's hydrant meter is prohibited and any found in use will be confiscated.

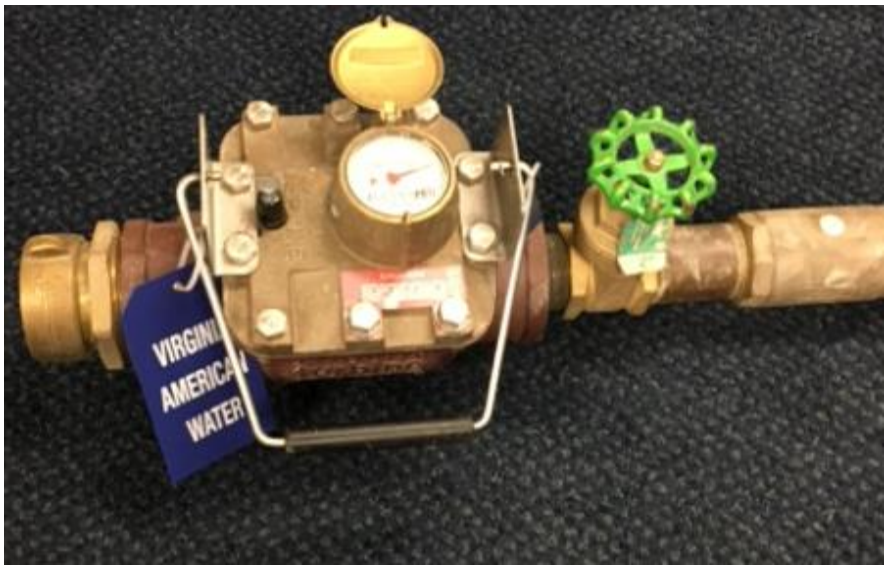


Figure 1 – VAWC Hydrant Meter with Identification Tag (Note: Some are painted red)

The process of obtaining the permit and hydrant meter involves the following steps:

Applicants must fill out a fire prevention permit application and submit it to the Department of Code Administration for processing. An application can be picked up at the Department of Code Administration located at 301 King St., Suite 4200, Alexandria, Virginia 22314 or online by accessing the City of Alexandria webpage; *Departments; Code Administration; Applications and Forms; Fire Prevention Permit Application* to access a pdf version of the application.

When filling out the application, provide all requested information except for the *"Permit Number FPP"*. The FPP number will be assigned by the Department of Code Administration staff. In *"The following permit(s) are applied for:"* section of the application, put in the following information – Section 506.5.7 Description Use of fire hydrant. Leave the fee section blank. Code Administration staff will calculate the permit fee. The permit fee is $143.00 plus administrative and other associated fees.

Once the application has been completed, submit application with payment for processing to the Department of Code Administration office. Payment can be made via check, money order, or credit card. The receipt issued will be required to obtain the hydrant meter from Virginia American Water Company (VAWC).

Applicants must also bring the hydrant wrench that will be used when opening or closing the hydrant to the Department of Code Administration office when submitting the application. Shown in **Figure 2** are examples of hydrant wrenches that are acceptable.

To obtain a hydrant meter, you must contact VAWC at 703-549-7080 or 1-800-452-6863 to schedule an appointment. You will be required to fill out a VAWC application and show the

receipt as proof of payment for the Fire Prevention permit. VAWC is located at 2223 Duke Street, Alexandria, Virginia 22314.

Once the application is processed by VAWC and the receipt is shown, the hydrant meter will be issued to the applicant.

Upon issuance of the hydrant meter, the applicant must contact the Fire Prevention and Life Safety Section (FPLS) of the Alexandria Fire Department at 703-746-4247 or 703-746-5227 so a Fire Marshal or Fire Inspector can meet the applicant and: (1) observe that the hydrant meter is installed and supported correctly, (2) observes that the applicant properly operates the hydrant, (3) ensure the location of the hydrant meter is not installed in a way that is hazardous or blocking any other critical functions in the area of use.

Once the Fire Marshal or Fire Inspector is satisfied that the applicant has met the requirements of the permit, the Fire Prevention Permit will be issued to the applicant. The permit must remain on site with the hydrant meter.

To keep a fire hydrant operational, the following instructions must be followed:

Operation of the fire hydrant requires an approved fire hydrant wrench **(Figure 2)** designed to fit the pentagonal (5 sided) operating nut on the bonnet (top) of the fire hydrant. When using the fire hydrant, it must be **FULLY OPEN** and when not in use, it must be **FULLY CLOSED**. Failure to follow these rules could undermine the hydrant and will result in the hydrant meter being confiscated, revocation of the fire prevention permit, and the permit holder paying for the repair of the hydrant and any other damage.

Figure 3 shows the proper method of supporting and connecting a hydrant meter assembly to a fire hydrant. In all cases, the hookup must be accomplished by using a control valve that is connected to the hydrant meter.

To avoid damage to the fire hydrant nozzle threads, the meter assembly must be properly supported at all times. Leakage at the couplings must be controlled using proper gaskets. Do not force or over tighten fittings on the fire hydrant nozzles.

The *fire official* or designee must authorize any variation from the requirement in writing. This authorization must be kept with the fire prevention permit at the actual site location.

Failure to comply with the conditions stated in this document, or any unauthorized device variations or use of a hydrant meter from another jurisdiction will result in confiscation of the meter assembly and revocation of the fire prevention permit.

Fire Marshals and Fire Inspectors will make periodic inspections to ensure the hydrant is completely on or off; the required valve is in place; the hydrant meter is properly supported; the permit is on site; and that the hydrant meter is the property of Virginia American Water

Company, not another water purvey in this area. This is validated by a Virginia American Water Company ID tag. Any other water purveyor's meter in use will be confiscated and returned upon obtaining a meter from VAWC.

Control Valve Blocking

Figure 2 – Approved Fire Hydrant Wrenches **Figure 3 – Proper Hydrant Meter Support**

<u>Private Fire Hydrant Paint Requirements</u> (CAFPC Section Appendix C Section C 101.1)

Fire hydrants **(Figure 4)** located on private property are owned by and the responsibility of the property owner. Responsibilities include annual inspection, testing, and maintenance including maintaining the paint colors and paint configuration approved for private fire hydrants in the City of Alexandria as follows:

- All private fire hydrant bodies and bonnets shall be painted Sherwin Williams "Safety Yellow" #B54YZ437.

- All private fire hydrant caps shall be painted Sherwin Williams "Pure White" #B54WZ401.

Figure 4 – Private Hydrant Paint Scheme

Temporary Standpipe Requirements (USBC Section 3311 – CAFPC / SFPC Section 3313)

In buildings required to have standpipes, at least one standpipe shall be provided for use during construction. Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes comply with the requirements as to capacity, outlets, and materials.

Standpipes shall be installed when the progress of construction is not more than 40 feet above or below the lowest level of fire department vehicle access. Standpipes shall be provided with fire department hose connections at accessible locations adjacent to usable stairs.

The temporary fire department hose connection shall be either the 4-inch Storz Quick Connect or two 2½ inch NST type. Where practicable, the fire department hose connection shall be brought as close to the street as possible and within 100 feet of an operational fire hydrant. The fire department hose connection shall have a temporary sign above the connection that can be clearly seen at street level without obstruction. Such standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring.

Standpipes shall be either temporary or permanent in nature, with or without a water supply, provided that the standpipes conform to the capacity, outlets, and materials requirements found in USBC Section 905.

<u>Fire Department Connection Requirements</u> (USBC Section 912)

All newly installed fire department connections and all replaced fire department connections on existing buildings where a single or multiple fire department connections are required will correspond to one of the following applicable configurations:

- Where new buildings require a minimum fire protection system demand of ***less than or equal to 250 gpm,*** contractors shall install a single 2-1/2-inch national standard thread fire department connection.

- Where new buildings require a minimum fire protection system demand ***greater than 250 gpm up to and including 1000 gpm,*** contractors shall install a single 4-inch Knox® StorzGuard® **locking cap** and 30° elbow adapter (Kit model number 5022 or 5023) at each fire department connection required on the building.

- Where new buildings require a minimum fire protection system demand ***greater than 1000 gpm,*** contractors shall install two, single 4-inch Knox® StorzGuard® **locking caps** and 30° elbow adapters (Kit model number 5022 or 5023) at each fire department connection required on the building.

Installation of a Knox® StorzGuard® adapter shall comply with the following requirements **(Figure 5)**:

- The Knox® StorzGuard® 30^{0} adapter shall connect to a corrosion resistant pipe incorporating national pipe thread (NPT). The top of the corrosion resistant pipe extending thru the exterior wall shall be a maximum of 48-inches above finished grade. All Knox® StorzGuard® adapters shall be angled at 30 degrees in a downward position. The bottom of the 4-inch Knox® StorzGuard® adapter after the 30-degree downward angle and cap shall be a minimum 18-inch above grade. (See attached detail).

- Each Knox® StorzGuard® adapter shall have a designated check valve.

- When installing more than one Knox® StorzGuard® adapter, each shall be a minimum of 18-inch and a maximum of 24-inches from center of outlet to center of outlet.

- A listed weatherproof audio / visual notification appliance, not less than 177 candelas, shall be mounted directly above any new Fire Department Connection at a minimum of 7’-0” to a maximum 10’-0” above grade. The dimension shall be measured from grade to the centerline of the device.

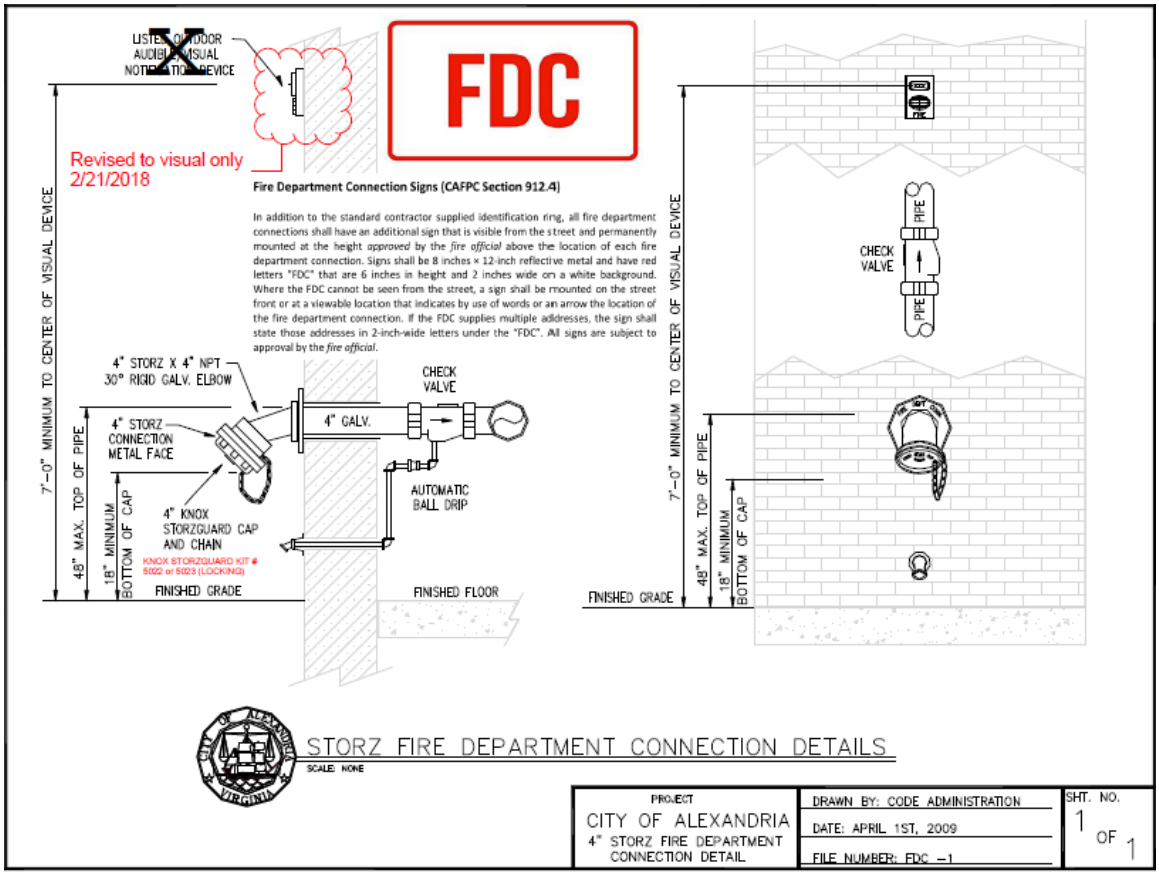


Figure 5 – Storz Installation Schematic

Pressure Reducing / Restricting / Regulating Fire Hose Valves

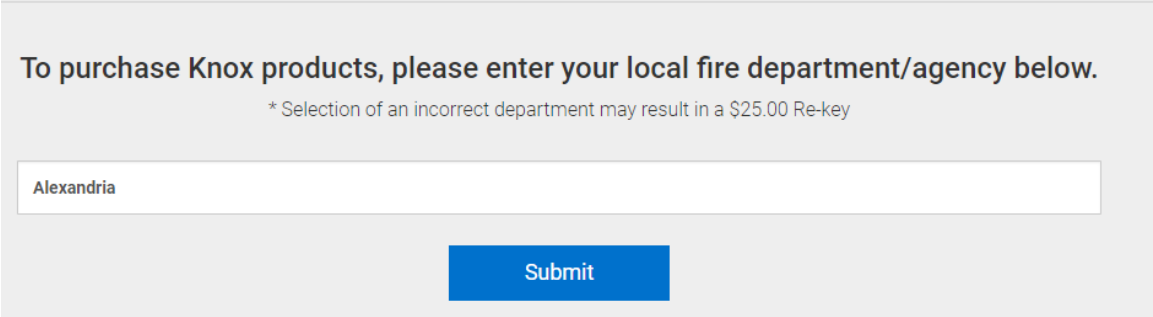
Due to the mechanical nature of pressure reducing, restricting, or regulating hose valves, problems with pressure and flow output can arise. Therefore, it is the request of the Alexandria Fire Department that if a building requires any type of pressure controlling hose valves, the design professional specify a type of hose valve that can be manually overridden by a firefighter without special tools, special knowledge, or effort. This is to provide full pressure and flow output from the valve should it be necessary during a fire event.

Ordering Components from the Knox® Company

- To avoid ordering problems, Contact Supervisor Jones at 703-746-4256 to discuss the number and type of boxes or accessories required for the building.

- Go to www.knoxbox.com

- Select the red **BUY** button and the following screen will display. Type in **Alexandria** and hit Submit.



- A list will show Alexandria locations that throughout the county. Hit the blue **Select Department** button associated with Alexandria Fire Dept Alexandria, Virginia 22314-1384.

- Once the product screen displays, scroll down to find the product you want to purchase and hit the **Select & Configure** or **Add To Cart** button under the product.

- If you are purchasing a Knox Box, you will select the color and whether you want surface mounted or recessed. Also, make sure you select "**No**" for the Tamper Switch.

- Once configured, hit the **Add To Cart** button and fill out all requested information. If you are purchasing more than one of the product, hit the **Save & Add Another** button. If you are only purchasing one, hit the **Submit** button.

- If you are purchasing other products, select the product and type in the requested information and hit **Submit**. If you are purchasing more than one of the product, hit the **Save & Add Another** button.

- Once you have completed your order, hit the Submit button. You will be at the checkout screen to confirm your order. If all is in order, hit the **Submit For eApproval** button.

- Complete the checkout process and once payment is made, an email will be sent to the Alexandria Fire Department for final approval.
- Once approved, the product will be shipped.

<u>Knox Box® and Key Requirements</u> (CAFPC / SFPC Sections 506 and 3310)

Section §506.1 of the City of Alexandria Fire Prevention Code requires a rapid entry system at new buildings where there is any type of fire protection system installed. The Alexandria Fire Department only uses the Knox Box® brand rapid entry system. The installation requirements are:

- The key boxes shall be located on the exterior of the building, within 5 feet of the main entrance and other entrances as determined by the fire official or designee.

- The key box center shall not be more than 5 feet or less than 4 feet above grade.

- Key boxes shall be of sufficient size to handle the number of key sets necessary to permit the fire department to operate during an emergency.

- The types and number of key boxes and the number of key sets, the required keys, or electronic access devices shall be determined by the fire official or designee. Typically, 3 complete sets will be required in the main 4400 Series Knox Box® and one set for all other 3200 Series Knox Box(es)®.

- Keys shall be labeled and coded **(Figure 6)** as follows:

  - Master Key (White)

  If individual Keys:

  - Main Entrance (Green)
  - Any additional entrance or exit points (Yellow)
  - Stairwell doors that are locked to prevent entry back on to a floor if an automatic override is not provided (Yellow)
  - Roof (Yellow)
  - Fire Control Room (Red)
  - Fire Alarm Reset (Red)
  - Sprinkler control pad lock(s) (Red)
  - Sprinkler Room (Red)
  - Elevator Firemen's Service (Red)
  - Elevator Machine Room (Blue)
  - Storage Room(s) (Orange)
  - Laundry Room(s) (Brown)
  - Mechanical Room(s) (Brown)

- Trash Room(s) (Brown)
- Electrical Room(s) (Purple)
- Apartment Master (Black)

Figure 6 – Key Labeling and Color Coding

<u>Sign Requirements</u> (CAFPC Appendix D Section 102)

Emergency Vehicle Easement Signs

Emergency vehicle easements shall be a minimum of 22 feet across the travel lane. The emergency vehicle easement shall provide access to strategic areas of the building and fire protection systems. Curbing and street components shall conform to the standards established by Transportation and Environmental Services and this document for emergency vehicle easements.

Emergency vehicle easement signs shall be metal construction, 12-inches wide and 18 inches in height. Provide red letters on reflective white background with a 3/8-inch red trim strip around the entire outer edge of the sign. The lettering shall say "NO PARKING," "FIRE LANE," "EM. VEH. EAS," and "City of Alex.," Lettering size shall be as follows: "NO PARKING" - 2 inches, "FIRE LANE" - 2½ inches. EM. VEH. EAS. - 1 inch, CITY OF ALEX. - ½ inch. Directional Arrows - 1 inch by 6 inches solid shaft with solid head - 1½ inches wide and 2 inches deep **(Figure 6)**. Signs shall be mounted with the bottom of the sign 7 feet above the roadway, and shall be properly attached to a signpost or other approved structure such as designated by the fire official. Posts for signs, when required, shall be metal and securely mounted. Signs shall be parallel to the direction of vehicle travel and posted so the directional arrows clearly show the boundaries and limits of the Emergency Vehicle Easement. In areas where emergency vehicle easements involve two-way traffic, double mounted signs shall be provided. The maximum distance between signs shall be 100 feet. Other special signs or modifications to emergency vehicle easement signs shall be approved by the fire official.

Where curbing is a component of the emergency vehicle easement, the curbing construction shall conform to weight and grade requirements for vehicular traffic. In no circumstances shall a raised curb be in the path of travel in an emergency vehicle easement. Where a mountable curb is provided as part of an emergency vehicle easement, emergency vehicle easement signs shall be posted at the point nearest the edge of the emergency vehicle easement, but in no case within the clear width of the emergency vehicle easement. Except for flush curbs, any fire department access points that require fire apparatus to mount a curb shall conform to the modified 3-inch curb design standard MOD CG-3 **(Figure 7)** or MOD CG-7 **(Figure 8)** design as shown.

Figure 6 – Emergency Vehicle Easement Signs

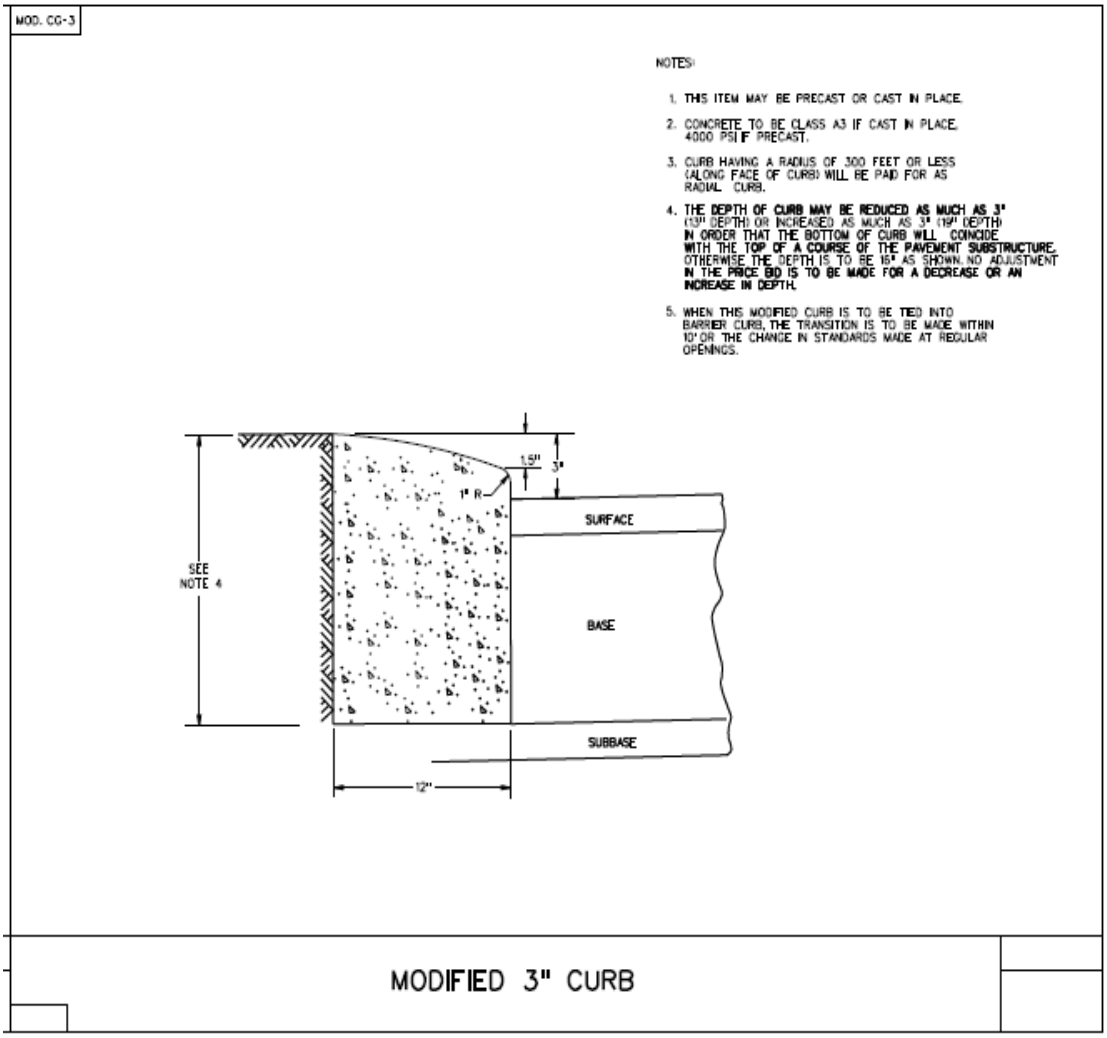


Figure 7 – Modified Curb – MOD CG-3

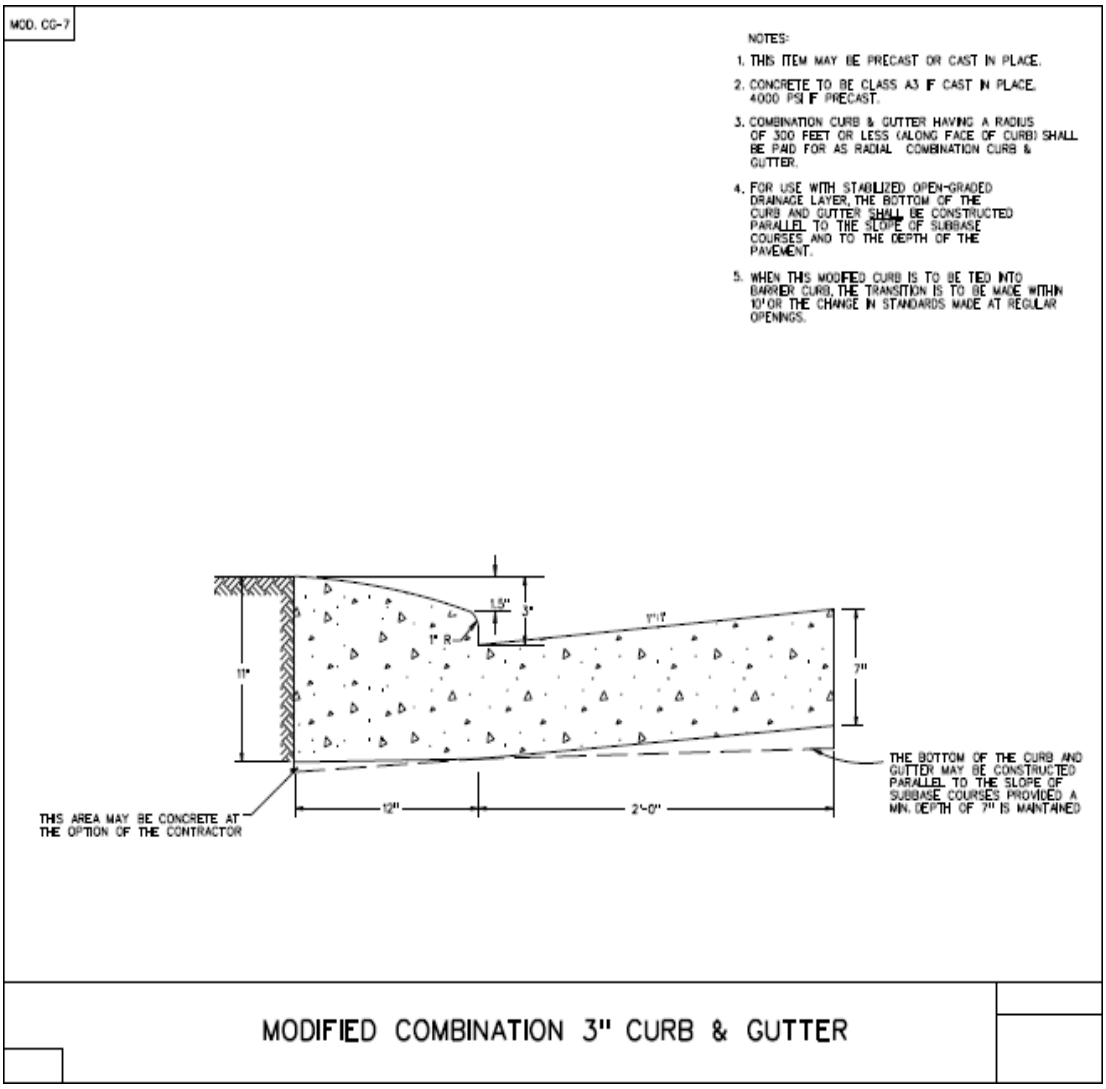


Figure 8 – Modified Curb – MOD CG-7

Stairway Signs (CAFPC Section 1022.9)

Provide Stairway Identification. Stairway identification signs **(Figure 9)** shall be provided at each landing in all interior exit stairways connecting more than three stories. Stairways shall be identified by letter designation starting next to the main entrance with "A" and continuing in a clockwise or left to right pattern using consecutive letters of the alphabet for each additional stairway. Two copies of the stairway signs shall be submitted to the fire official for approval before occupancy.

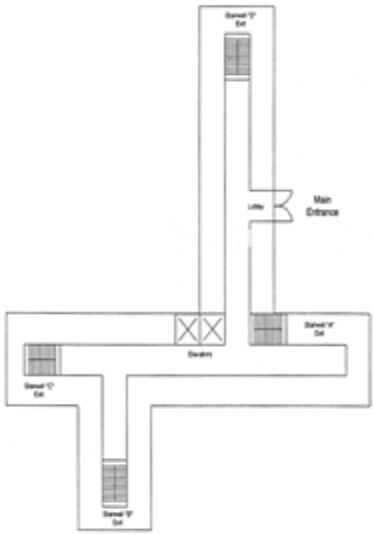
Stairway signs shall designate the stairway letter, state the floor level, the level of exit discharge, and if there is access or no access to the roof regardless if the access door or roof

hatch locks. The bottom of the sign shall be located five (5) feet above the floor landing in a position that is readily visible when the stairwell door is opened or closed. The signs must have lettering that is a minimum of 2 inches but no greater than 4 inches in height. This information may be stenciled directly onto the wall but all lettering must be of a color contrasting with the background stairway wall color.

In buildings greater than three stories where there is no graphic representation of the building footprint, a simplified building schematic must be display in the lobby **(Figure 10)**. The simplified building footprint shall be an overhead view of the building exterior and the general layout of the lobby of the first floor. Stairways shall be denoted by letter as required.

Ex. Stairway Identification Sign

Figure 9 – Stairway Identification Sign



Ex. Building Footprint Sign

Figure 10 – Footprint Sign

Special Building Identification / Address Signs in Stairways

Special building identification / address signs may be required to be installed in stairways that are part of a common vehicle garage where buildings with different addresses are constructed above the common vehicle garage. The purpose is to avoid confusion and ensure safety so that emergency responders know and can communicate their exact location in relation to the buildings above the common vehicle garage.

Fire Protection System Signs (CAFPC Sections 509)

Fire protection equipment including but not limited to fire alarm, fire sprinkler, fire suppression, fire pump systems, and fire control rooms shall be identified in an *approved* manner. *Approved* signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible. Where required by the *fire code official*, gas shutoff valves, electric meters, service switches, and other utility equipment shall be clearly and legibly marked to identify the unit or space that it serves. Identification shall be made in an *approved* manner, readily visible and shall be maintained.

Fire Department Connection Signs (CAFPC Section 912.4)

In addition to the standard contractor supplied identification ring, all fire department connections shall have an additional sign that is visible from the street and permanently mounted at the height *approved* by the *fire official* above the location of each fire department connection. Signs shall be 8 inches × 12-inch reflective metal and have red letters "FDC" that are 6 inches in height and 2 inches wide on a white background. Where the FDC cannot be seen from the street, a sign shall be mounted on the street front or at a viewable location that indicates by use of words or an arrow the location of the fire department connection. If the FDC supplies multiple addresses, the sign shall state those addresses in 2-inch-wide letters under the “FDC”. All signs are subject to approval by the *fire official*.

NFPA 704 Hazardous Materials Sign Requirements (CAFPC /SFPC Section 5003.6)

Where materials defined as hazardous are being dispensed, used, or stored that involves a physical or health hazard, a NFPA 704 sign **(Figure 11)** is required to be affixed to two exterior walls or enclosures containing a means of access to a building or facility, each access to a room or area, each principal means of access to an exterior storage area, and to any storage containers or above ground storage vessels. Signs shall be constructed of durable materials, permanently installed, and readily visible. The sign requirement applies during construction and for any building where hazardous materials will be used, dispensed, or stored.

Figure 11 – NFPA 704 Hazardous Material Identification Sign

<u>Vehicle Ingress Gate Requirements</u> (CAFPC Section 503.6.1)

All security gates that restrict automatic operation by the fire department and require special keys, tools, openers, or knowledge to override shall be fitted with two override functions including a yelp siren sensor and a manual key override (Knox® item number 3501) as approved by the *fire official*. Depending on the type of gate, but in most cases building, electrical, and fire protection system permits are required.

Radio Communication Requirements (Developmental Site Plan Requirement)

The applicant of any building or structure constructed greater than 10,000 square feet; or any building or structure which constructs an addition greater than 10,000 square feet shall contact the City of Alexandria Radio System Manager in the Department of Emergency Communications prior to submission of a final site plan. The proposed project shall be reviewed for compliance with the radio requirements of the City of Alexandria to the satisfaction of the City of Alexandria Radio System Manager prior to site plan approval. Such buildings and structures shall meet the following conditions:

The building or structure shall be designed to support a frequency range between 806 to 815 MHz and 851 to 860 MHz.

The building or structure design shall support minimal signal transmission strength of -95 dBm within 90 percent of each floor area.

The building or structure design shall support a minimal signal reception strength of -95 dBm received from the radio system when transmitted from within 90 percent of each floor area. Areas deemed critical by the City of Alexandria, such as fire control rooms, exit stairways, and exit passageways shall provide 99 percent coverage exceeding -95 dbm when transmitting or receiving.

The building or structure shall be tested annually for compliance with City radio communication requirements to the satisfaction of the Radio System Manager. A report shall be filed annually with the Radio System Manager which reports the test findings.

If the building or structure fails to meet the above criteria, the applicant shall install to the satisfaction of the Radio System Manager such acceptable amplification systems incorporated into the building design which can aid in meeting the above requirements. Examples of such equipment are either a radiating cable system or an FCC approved type bi-directional amplifier. A bi-directional amplifier or other powered equipment must consist of two power sources:

Primary Source: Dedicated branch circuit.
Secondary Source: Battery backup capable of powering the system for 12 hours at 100 percent

capacity.

Final testing and acceptance of amplification systems shall be reviewed and approved by the Radio System Manager. The Radio System Manager Eric Parker can be reached at 703-746-1863 or eric.parker@alexandriava.gov .

Note: In most if not all situations where firefighter emergency telephones would be required including elevators, the phones can be removed from the design if the applicant installs a radio system based on these requirements and submits a Code Modification request to the Director of Code Administration for review and approval.

Fire Alarm and Detection Systems Requirements

Annunciation Panel Display

To avoid any problems with the content and information displayed on any graphic type annunciation panel whether a drawing or electronic, and in addition to the Code Administration office review, it shall be reviewed and approved by the *fire official.*

Controlled Ingress and Egress Override (USBC Section 403.5.3)

In buildings where the stairway doors are looked from the side opposite the egress side but are openable from the egress side; where a building does not have a fire command center; and the stairway doors are not arranged in accordance with Virginia Uniform Statewide Building Code section §403.5.3, a Knox® Key Switch (Model #3501) shall be installed at the annunciation panel to facilitate unlocking of all locked stairway doors.

Fire Watch Requirements (CAFPC Section 901.7)

Impaired Systems

When a system becomes impaired or is unable to provide the proper protection for which it was designed, for short term and on a temporary basis, a fire watch shall be established in accordance with the following requirements to provide onsite observation, documentation, and notification in the event of a fire emergency.

When the establishment of a fire watch is ordered by the fire department operations personnel, the fire official, or is necessary due to system impairment, the owner or the owner's representative shall implement the following procedures and requirements for the duration

of the fire watch. The fire watch shall be maintained until such time the noted system(s) is returned to normal ready service and approved for use by the fire official.

A fire watch shall consist of a designated number of staff (minimum of two personnel) at all times and until the compromised system has been repaired, inspected, tested and certified to be placed back in service by the fire official. Each participating staff member shall be equipped with reliable two-way communications. One staff member shall always be stationed in an area or room equipped with a working telephone or cellular phone to report an alarm by dialing 9-1-1.

When dialing 9-1-1 from a cellular phone, some cellular phone systems may connect user with another jurisdiction's emergency communications center, therefore the caller should confirm they are speaking with the Alexandria Department of Emergency Communications. A walking tour of all areas of the building affected shall occur no less than every 10 minutes to observe for conditions where fire, smoke, or hazardous situations require fire department response, or a complete tour of the facility shall occur within a time frame prescribed by a representative of the fire department operation personnel, fire official, or designee and with the staffing level contingent upon the size of the facility and the type of occupancy.

If the building or property is of such size that two individuals cannot adequately perform the required fire watch, fire department personnel, or the fire official may require additional onsite personnel. Fire Department personnel or the fire official may permit one person to perform the fire watch if the building or property is of a size that one person can adequately perform the fire watch.

A legibly written log shall be kept on site at all times for review by any fire department operations personnel or the fire official, and it shall contain the following information: reason the fire watch was implemented; date and time the fire department was notified the fire watch was initiated and concluded; start and stop time of each building or property tour; key locations visited in the building(s) requiring the fire watch; name(s) of personnel conducting the fire watch; name(s) of personnel recording the information.

A tag shall be used to indicate that a system, or portion thereof, has been removed from service.

An all-weather tag shall be posted at each fire department connection, system, control valve, fire alarm control unit, fire alarm annunciator, and fire command center indicating which system or part thereof has been removed from service. The fire official shall specify where the tag is to be placed.

In all cases, the sole duty of personnel assigned to the fire watch shall be to perform constant patrols of the protected premises, to keep watch for fires, and if necessary to summon the fire

department. Personnel conducting the fire watch shall be: capable of performing patrol duties; reliable; not addicted to the use of or under the influence of intoxicants, narcotics, illegal drugs, and/or physically or mentally impaired by prescription drugs; able to clearly and accurately converse with fire department personnel in English, in the event of any emergency; able to remain awake and alert at all times.

If a fire is located, the fire watch staff shall not attempt to extinguish the fire. The fire watch staff shall immediately call 9-1-1 and report the location of the fire within the building. If possible, the fire watch staff shall sound the building alarm by activation of a manual station. If safe to do so, the fire watch staff shall begin the evacuation of the building starting on the fire floor, then above the fire floor, then below the fire floor.

When the fire sprinkler, alarm, detection or suppression system is back in service, the fire watch personnel shall contact the Department of Emergency Communications to place the system back in normal ready service.

Routine Inspection, Testing, Maintenance, and Repair Requirements (CAFPC Section 901.7.7)

The fire department and or fire official shall be immediately notified when a fire sprinkler, alarm, detection, suppression, or protection system is out of service for routine inspection, testing and maintenance. Any person or organizations performing any of these activities shall notify the Department of Emergency Communications and provide the name of the responsible person and organization, telephone number, and estimated time the system or systems will be out of service. If it is determined by the fire official that the inspection, testing, or maintenance of the system or systems presents an unacceptable level of risk for the period of the inspection, test, or maintenance, a fire watch shall be required by the fire official.

Upon completion of the inspection, testing, maintenance, or repair, the responsible party shall contact the Alexandria Department of Emergency Communications to place the system back in normal ready service.

Fire Department Occupancy Inspection Check List

The fire department has a role in the process that permits the building owner or tenants to gain temporary or permanent occupancy. There are several different exterior and interior components that must be in place to permit occupancy. Use the following check list as a basic guide for occupancy inspection issues. Some or all of the following items on the check list may

apply, therefore it is incumbent on the responsible party to ensure all applicable items are in place and completed at the time of inspection.

Exterior	**Yes**	**No**	**N/A**
All addresses posted?			
Fire department access unobstructed?			
Knox Box(s) installed and all required keys in box?			
Fire Department Connection(s) installed according to approved site plan, correct size, accessible, unobstructed, identified, required signage in place?			
Fire hydrants installed according to approved site plan, correct nozzle outlet size installed, accessible, protected, and correctly painted?			
Fire Sprinkler / Fire Alarm / Fire Control / Fire Pump room door labeled?			
Vehicle ingress gates functional or open?			
NFPA 704 signs installed?			
Emergency Vehicle Easement (EVE) signs installed?			
Exterior exit doors unobstructed to public way?			

Interior	**Yes**	**No**	**N/A**
All fire protection equipment identified / labeled and accessible?			
All access panels to fire protection equipment identified / labeled and accessible?			

All exit signs operational and in correct location?			
Is a Fire Prevention Permit required and issued?			
Fire doors labeled, operational, and positive latch?			
Fire door-hold open devices release?			
Egress not obstructed or obscured?			
Sensor release / magnetic locking / delayed egress operational?			
Emergency contact information provided?			
Storage / combustible storage properly managed?			
Is waste properly handled and accumulation managed?			
Ignition sources managed?			
Seating plans / occupancy loads posted?			
Safety Data Sheets / Hazardous Material Management Plan / Hazardous Material Inventory Statement provided?			
Stairway identification signs installed / accurate?			
Fire safety / evacuation plans provided?			
Interior finish flame spread ratings verified?			