

V. Inspection Processes with Checklist

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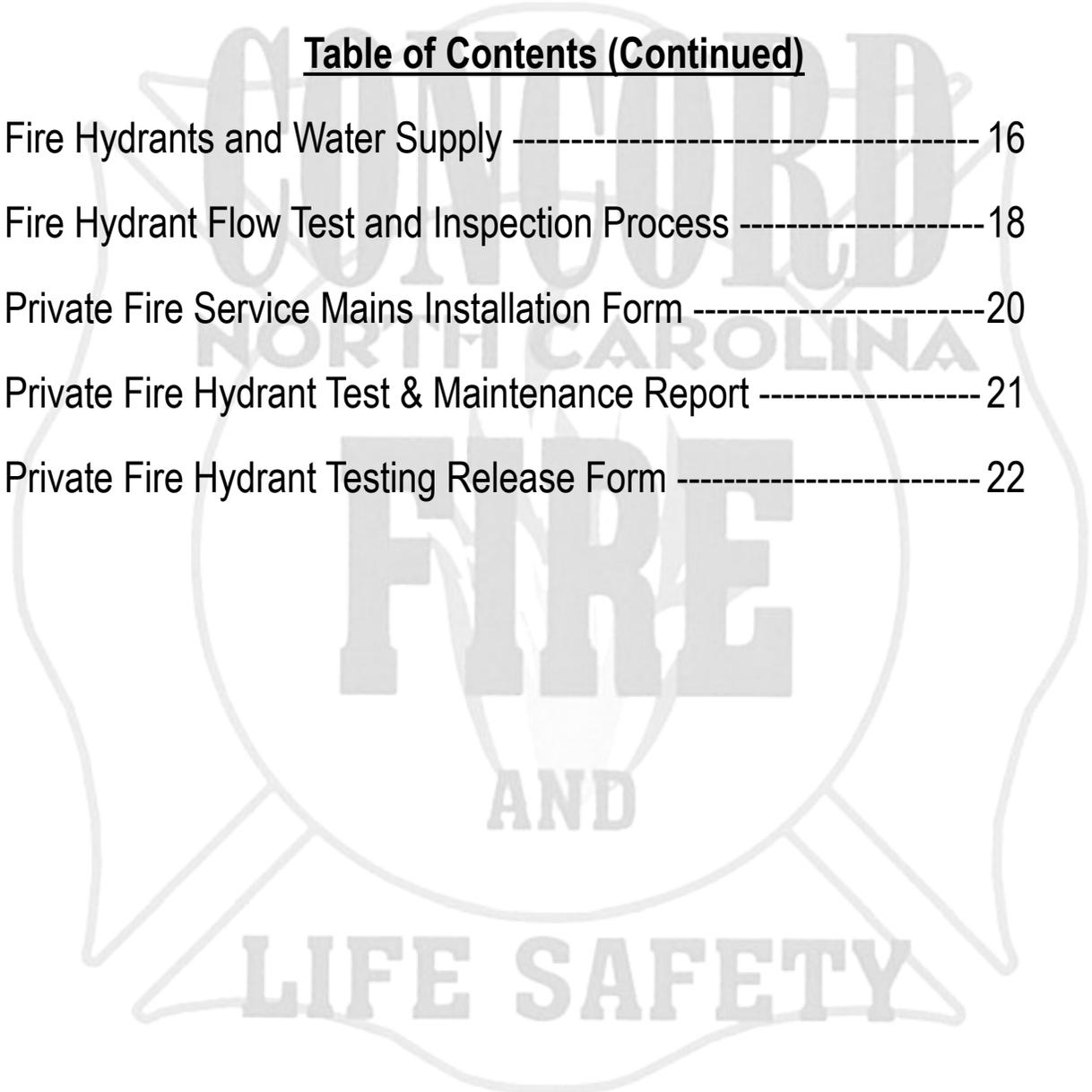
A large, light gray watermark logo for Waterford Fire and Life Safety is centered on the page. The logo features a Maltese cross with a fire hydrant in the center. The text "WATERFORD" is at the top, "NORTH CAROLINA" is below it, "FIRE" is in large letters in the center, "AND" is below that, and "LIFE SAFETY" is at the bottom.

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Underground Fire Line and FDC Inspection & Flush

1. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
2. Provide Underground Contractor's Material and Test Certificate. Certificate shall be provided prior to flush inspection. Flush inspection shall not be conducted without this documentation.
3. Consult the approved plans.
4. Verify;
 - a. Size of piping.
 - b. Type of piping.
 - c. Depth of piping.
 - d. Proper pipe configuration of;
 - i. Thrust blocks and pipe bracing.
 - ii. Protective wrap (polywrap) of piping. (Applies to ductile only.)
 - iii. Direction changes.
 - iv. Location of;

Backflow Device.

Proper Size.

Correct Direction.

Monitored tamper switches installed on OS&Y control valves.

If in aboveground vaults, verify heater device installed.

Remote Fire Department Connection.

Remote Fire Department Connection shall be located a minimum of twenty-five feet and on same side of a fire hydrant.

Remote Fire Department Connection shall be located a minimum of forty feet from building.

If Fire Department Connection services only one building, then paint supply piping red and stencil the address with 3-inch white letters.

If Fire Department Connection serves more than one building, then provide a 12-inch by 18-inch red background sign with the addresses the Fire Department Connection serves in 3-inch white letters.

Verify three-foot diameter clearance around Fire Department Connection.

Fire Department Connection shall be installed between 18 and 48 inches above finish grade and the 2.5-inch ports shall face fire lane.

Verify National Standard Fire Hose Threads (NST) Installed.

Verify that the 2.5-inch break away caps are installed.

Verify that swing check valve is installed as close to Fire Department Connection as possible and its installed in correct direction.

Fire hydrants.

The large (4.5 inch) port must be facing directly towards the Fire Lane.

Center of 4.5-inch port shall not exceed 18 inches above finish grade.

Three foot diameter clearance around hydrants.

Verify all valves are open in the system (including fire hydrant sectional valves).

Observe hydrostatic test of all piping at 150 psi for 2 hours or 50 psi in excess of system working pressure which ever is greater.

Relieve pressure after hydrostatic test and confirm the test gauge returns to zero.

(A gauge that does not return to zero could be an indication that the gauge was pegged.)

Observe flushing of all piping with city water until clear.

Rough Fire Sprinkler Piping Inspection

1. The fire sprinkler contractor shall schedule inspection.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
3. Consult the approved plans.
4. Verify;
 - a. Proper type of piping.
 - b. Backflow device (if installed in building) for size, type, and direction.
 - c. Confirm the installation of the piping does not have excessive change of directions that are not indicated on approved plans. (Excessive use of extra fittings, such as elbows may effect hydraulic calculations).Proper size of piping.
All piping penetrations through fire rated assemblies have been properly sealed by an approved method.
 - e. Proper piping hangers and supports with correct spacing.
 - f. Sway bracing is installed per NFPA Code requirements. Sway bracing is required at top of fire riser, turn of directions, and every forty feet on main piping only.
 - g. Proper type and temperature of sprinkler heads.
 - h. Proper clearance of sprinkler heads from obstructions.
 - i. Check for correct distances between sprinkler heads, off of walls, maximum coverage per sprinkler heads, suspended ceilings and distance below roof deck.
 - j. Check for installation of orifice in inspector's test. (Orifice shall be the same size as the smallest orifice installed in the system.)
 - k. Check to ensure fire sprinklers are not painted. Painted fire sprinklers shall be replaced, they shall not be cleaned.
 - l. All control, auxiliary, and inspector's test valves shall not be located more than seven feet above finish floor or grade.
 - m. Minimum 12" x 36" Access panels shall be provided for all valves located inside a wall or concealed space. Signage shall be provided on the outside of access panel indicating type of valve that is concealed within.
5. The standpipe contractor shall provide all hose, gauges and associated equipment to perform all tests.
6. Observe hydrostatic test of all piping at 200 psi for 2 hours or 50 psi in excess of system working pressure which ever is greater. Testing shall include all FDC piping.
7. Relieve pressure after hydrostatic test and confirm the test gauge returns to zero. (A gauge that does not return to zero could be an indication that the gauge was pegged.)
8. Verify all signage is in place. (Examples: control valves, inspectors test, and main drain.)
9. Verify that spare sprinkler head cabinet is installed in an area that will not exceed 100 degrees Fahrenheit and has inside the correct number of spare sprinkler heads, sprinkler wrench, and NFPA 25.
10. Verify the following when the Fire Department Connection located on building:
 - a. Fire Department Connection shall be within one hundred feet of a fire hydrant.
 - b. Fire Department Connection shall be located on address side of building or located on the building in the fire access approach.
 - c. Signage for fire department connection shall be per NFPA 13 and City of Concord code requirements.
 - d. Fire Department Connection shall be installed between 18 and 48 inches above finish grade. Verify that swing check valve is installed as close to Fire Department Connection as possible and is installed in correct direction.Verify that National Standard Fire Hose threads are installed.
Verify that the 2.5-inch break away caps are installed.
Verify Fire Department Connection is not blocked by any outside obstructions. (Example: electrical transformers.).
Verify FDC Sign has been installed to City of Concord Code requirements.

Final Fire Sprinkler Inspection

1. The fire sprinkler contractor shall schedule inspection.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
3. Fire sprinkler contractor shall provide an Above Contractor Material and Test Certificate for each system installed. Final fire inspection shall not be conducted without this documentation.
4. Consult approved plans.
5. Verify proper components are installed and functioning on the sprinkler system riser.
 - a. Tamper switch.
 - b. Water flow switch.
6. The standpipe contractor shall provide all hose, gauges and associated equipment to perform all tests.
7. Observe a main drain test and verify the residual pressure at the base of the riser meets or exceeds the required the system demand pressure listed in the approved hydraulic calculations.
 - a. Test shall be performed at peak water demand.
 - b. Test must flow for at least two minutes.
8. Document static and residual pressures listed on the "calc" plate.
9. Verify proper signage on riser components.
 - a. Main drain.
 - b. Access panels shall be provided for all valves located inside a wall or concealed space. Signage shall be provided on the outside of access panel indicating type of valve that is concealed within.
 - c. Control valve.
 - d. Inspectors test.
 - e. Hydraulic "Calc" Plate. (If sign is on a fire riser located outside or in an area exposed to corrosion then sign shall be metal and engraved or stamped.)
10. Verify that spare sprinkler head cabinet is installed in an area that will not exceed 100 degrees Fahrenheit and has inside the correct number of spare sprinkler heads, sprinkler wrench, and NFPA 25.
11. Verify floor is sealed where riser penetrates the building.
12. Walk through building to verify;
 - a. Proper placement, type, and temperature of sprinkler heads.
 - b. Sprinkler heads are free of obstructions by building elements (i.e. light fixtures, ceiling fans, decorations, etc.)
 - c. Check to ensure fire sprinklers are not painted. Painted fire sprinklers shall be replaced, they shall not be cleaned.
 - d. Check to ensure fire sprinklers escutcheons are properly installed.
13. Observe activation test of fire alarm notification appliances, including electric bell on fire sprinkler system water flow through inspector's test valve. Alarms shall activate in 90 seconds or less with the flow switch adjustment setting on or greater than "B". Document time alarms activated.

Rough Standpipe Piping Inspection

1. The standpipe contractor shall schedule inspection.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
3. Consult the approved plans.
4. Verify;
 - a. Proper type of piping.
 - b. Backflow device (if installed in building) for size, type, and direction.Confirm the installation of the piping does not have excessive change of directions that are not indicated on approved plans. (Excessive use of extra fittings, such as elbows may effect hydraulic calculations).
Proper size of piping.
All piping penetrations through fire rated assemblies have been properly sealed by an approved method.
Proper piping hangers and supports with correct spacing.
Sway bracing is installed per NFPA Code requirements. Sway bracing is required at top of fire riser, turn of directions, and every forty feet on main piping only.
Proper type of discharge outlets (2½, 1½ with caps) and National Standard Hose Threads.
5. The standpipe contractor shall provide all hose, gauges and associated equipment to perform all tests.
6. Observe hydrostatic test of all piping at 200 psi for 2 hours or 50 psi in excess of system working pressure which ever is greater. Testing shall include all FDC piping.
7. Relieve pressure after hydrostatic test and confirm the test gauge returns to zero. (A gauge that does not return to zero could be an indication that the gauge was pegged.)
8. Verify all signage is in place. (Examples: control valves, drains and main drain.)
9. Verify the following when the Fire Department Connection located on building:
 - a. Fire Department Connection shall be within one hundred feet of a fire hydrant.
 - b. Fire Department Connection shall be located on address side of building or located on the building in the fire access approach.
 - c. Signage for fire department connection shall be per NFPA 13 and City of Concord Code requirements.
 - d. Fire Department Connection shall be installed between 18 and 48 inches above finish grade.Verify that swing check valve is installed as close to Fire Department Connection as possible and is installed in correct direction.
Verify that National Standard Fire Hose threads are installed.
Verify that the 2.5-inch break away caps are installed.
Verify Fire Department Connection is not blocked by any outside obstructions. (Example: electrical transformers.).
Verify FDC Sign has been installed to City of Concord Code requirements.

Final Standpipe Inspection

1. The standpipe contractor shall schedule inspection.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
3. Standpipe contractor shall provide an Above Contractor Material and Test Certificate for each system installed. Final fire inspection shall not be conducted without this documentation.
4. Consult approved plans.
5. Verify proper components are installed and functioning on the standpipe system.
 - a. Tamper switch.
 - b. Water flow switch.
6. The standpipe contractor shall provide all hose, gauges and associated equipment to perform all tests.
7. Test of Manual Standpipes:
 - a. For a manual standpipe, a fire department pumper or portable pump of a capacity to provide required flow and pressure shall be used to verify the system design by pumping into the fire department connection.
 - b. A flow test shall be conducted at each roof outlet to verify that the required pressure is available at the required flow.
 - c. The maximum flow to be demonstrated from a single hose connection shall be 946 L/min (250 gpm) for a 65-mm (2-in.) connection and (379 L/min) 100 gpm for a 40-mm (1-in.) connection.
8. Testing of Automatic- and Semiautomatic-Dry Systems.
 - a. Automatic- and semiautomatic-dry systems shall be tested by initiating a flow of water from the hydraulically most remote hose connection.
 - b. The system shall deliver a minimum of 946 L/min (250 gpm) at the hose connection within 3 minutes of opening the hose valve.
 - c. Each remote control device for operating a semiautomatic system shall be tested in accordance with the manufacturer's instructions.
9. Verify floor is sealed where riser penetrates the building.
10. All valves, pressure-regulating devices and associated equipment shall be tested to ensure proper working order. Pressure and gravity tanks shall be filled and tested for leakage and proper flow. Pumps shall be tested and deliver the system's intended flow and pressure.
11. Observe activation test of fire alarm notification devices. Alarms shall activate in 90 seconds or less with the flow switch adjustment setting on or greater than "B". Document time alarms activated.
12. All flow pressures including fire department pump pressures shall be documented.
13. The installing contractor shall provide the owner with the following:
 - a. All literature and instructions provided by the manufacturer describing the proper operation and maintenance of equipment and devices installed
 - b. A copy of NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.

Rough Fire Alarm Inspection

1. Must be scheduled by the fire alarm contractor.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
 - a. Installation of fire alarm systems includes pulling wire, installing conduit, placement of fire related boxes (pull stations, horn strobes, detectors, etc.)
3. Consult approved plans.
4. Verify the following:
 - a. Proper wire type.
 - b. Proper wire gauge.
 - c. Verify that a Class "B" loop has been installed. All fire alarm systems installed in the City of Concord shall be a minimum Class "B".
 - d. Verify support of all conduit and back boxes, including protective bushings in conduit.
 - e. Verify support of all wiring is per NFPA 72 and National Electrical Code (NEC).
 - f. Verify location of all fire alarm system devices.
 - g. Location of fire alarm control panel.
 - h. Location of annunciator panel or annunciator strip pad if required.
 - i. Proper separation of wiring. (A minimum of four feet separation between wiring on the horizontal runs and one-foot separation on vertical runs shall be provided.)
5. Verify that fire alarm wiring has not been painted or damaged during installation.
6. Duct detectors are required for units that exceed 2000 cfm or units that share an area that exceed 2000 cfm collectively. When duct detectors are required the shall provide the following:
 - a. Unit shut down on activation of the duct detector.
 - b. On activation of the duct detector a fire alarm signal shall be sent to the fire alarm control panel.
 - c. A ceiling remote annunciator shall be installed with a LED at ceiling level that will light up when the duct detector is activated.
 - d. All devices shall be marked with their appropriate zone indicator.
7. Verify hood fire suppression system wiring has been installed from kitchen exhaust hood system to fire alarm control panel "FACP".

Final Fire Alarm System Inspection

1. Provide NFPA 72 Report. Report shall be completed and faxed to Fire Marshal's Office at 704-782-3488 prior to scheduling final fire alarm inspection. Final fire inspection shall be conducted without this documentation.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
3. Consult approved plans.
4. Verify the proper location and type of all fire alarm devices.
5. Observe fire alarm system functional tests of all fire alarm devices, including duct detectors.
6. Observe activation test of fire alarm notification appliances, including electric bell on fire sprinkler system water flow through inspector's test valve. Alarms shall activate in ninety seconds or less with the flow switch adjustment setting on or greater than "B".
7. Observe activation test of fire sprinkler control valve tamper switches. On activation of the tamper switch a supervisory signal shall be sent to the fire alarm control panel.
8. Observe activation test of fire alarm notification appliances on kitchen hood suppression system activation, if applicable.
9. Verify the following from all tests:
 - a. Measure decibel reading of notification appliances. Decibel reading shall be 15 dB above ambient noise level.
 - b. Verify proper voltage drop, if required.
 - c. Verify a Class "B" fire alarm system is installed.
 - d. Verify the proper size of the batteries.
 - e. Verify duct detectors provide the following; HVAC unit shuts down on activation of the duct detector, on activation of the duct detector, an alarm signal shall be sent to the fire alarm panel and a ceiling remote annunciator is installed with a LED provided at ceiling level that lights up when the duct detector is activated.
 - f. Observe a twenty-four stand by battery power test. Electrical breaker that provides power to the fire alarm control panel shall be turned off twenty-four hours prior to this test. At the end of the twenty-four hours an audible test shall be conducted for five minutes.
 - g. Verify that all signals are received at the fire alarm control panel.
 - h. Verify that all signals are received at the annunciator, if applicable.
 - i. Verify that all signals were received at the off-site monitoring agency.
 - j. Monitoring report shall be faxed to Fire Marshal's Office at 704-782-3488 after completion of final testing. Monitoring report shall include twenty-four hour battery power fault.
10. Fire alarm Zone maps shall be located at each FACP and if necessary, at all remote annunciator locations. Maps shall include:
 - Floor plan of the occupancy being protected by the Fire Alarm.
 - All detection device locations.
 - Indicate type of detection device.
 - Indicate detection device zone assignment or "Address".
 - The map shall be properly mounted to the wall and measures shall be taken to protect the map from damage or vandalism.
11. Fire Official shall place an "In The Event Of Fire Alarm Activation" sticker on fire alarm panel or at remote annunciator location.

Kitchen Hood Suppression System Inspection

1. The kitchen hood suppression system contractor shall schedule inspection.
2. Verify the installing contractor has a valid City of Concord business license. No fire inspections will be conducted until license is obtained.
3. Consult approved plans.
4. Verify the following;
 - a. Location of manual pull stations.
 - b. Signage of manual pull stations.
 - c. Location, size, and type extinguishing agent.
 - d. Proper pipe size.
 - e. Proper pipe support.
 - f. Proper nozzle type.
 - g. Nozzle location.
 - h. Observe air movement through all system nozzles.
 - i. Observe test of fusible link.
 - j. Observe activation of manual pull stations.
 - k. Observe deactivation of all fuel sources under hood during all tests (Electric and Gas).
 - l. Observe deactivation of "make up air" on test activation of system (Exhaust air shall remain working).
 - m. Observe activation of fire alarm notification appliances on kitchen hood suppression system activation on all tests and verify that signal is received at the fire alarm panel.
 - n. Verify proper placement of Class "K" fire extinguisher. Class "K" fire extinguisher shall be located within thirty feet of cooking equipment.

Indicate total number of flow points per system and flow points used.

Verify 3-inch system numbers installed at pull station(s), firing cabinet and hood locations to coordinate system component locations.

If applicable, verify HVAC unit shut down.

Final Fire Building & Site Inspection

1. Verify building address size and location.
6" minimum letters/numbers required.
Address characters shall be visible from street or road fronting the property and if required, on all fire department approaches.
2. Verify proper location of Knox Box(s).
Knox boxes shall be installed approximately sixty inches above finish grade.
Keys to all doors and pad locks shall be placed inside Knox Box at final inspection.
Call 704-920-5517 to lock up keys when locks are changed "every time".
3. Verify the placement of fire extinguishers
Verify correct type (Example: 5# ABC 10 BC)
Proper location. Fire extinguishers shall be installed a maximum travel distance of every seventy-five feet.
All fire extinguishers shall be installed a maximum of five feet to the top of the fire extinguisher above finish floor or grade and shall be unobstructed from access or view. Provide signage as required.
4. Verify building door signage.

Provide the letters "FACP" on all unobvious doors that give access to the fire alarm control panel. This can be accomplished with self-adhesive letters, stencil, or a sign with minimum three-inch high letters in contrast to the door colors.
Provide the letters "RISER ROOM" on all doors that give access to riser. This can be accomplished with self-adhesive letters, stencil, or a sign with minimum three-inch high letters in contrast to the door colors.
Provide the letters "FACP" and "RISER ROOM" on all doors that give access to the fire alarm control panel and fire riser. This can be accomplished with self-adhesive letters, stencil, or a sign with minimum three-inch high letters in contrast to the door colors.
Provide on the suite front doors the "SUITE NUMBER OR LETTER". This can be accomplished with self-adhesive characters, stencil, or a sign with minimum six-inch high characters in contrast to the door colors.
Provide on the suite back or side doors the "SUITE NUMBER OR LETTER" and "BUILDING ADDRESS NUMBERS". This can be accomplished with self-adhesive characters, stencil, or a sign with minimum six-inch high characters in contrast to the door colors.
5. Verify fire lanes are appropriately marked.
Where designated, fire lanes shall not be less than twenty (20) feet wide at any point, and curves and corners shall be wide enough to permit the passage or operation of all fire equipment owned by the city. The surface of the fire lanes shall be an all-weather surface and shall be of sufficient strength to support all firefighting apparatus used by the fire department.
All fire lanes and access roads must be maintained by the property owner, which includes painting pavement and placing permanent (NO PARKING FIRE LANE) signs.
Outlining or painting the fire lane on the roadway surfaces shall be done in red with white letters that read "FIRE LANE" at fifty (50) foot intervals or as otherwise directed by the fire department.
Fire lanes shall be marked with permanent "NO PARKING FIRE LANE" signs.
Signs shall be placed along the fire lane at intervals not to exceed one hundred (100) feet.
Signs shall measure twelve (12) by eighteen (18) inches; have red letters on a white reflective background.
Signs must be metal construction only, plastic or wooden signs are not acceptable.
Mounted at a minimum height of four (4) feet to a maximum of seven (7) feet.

FIRE LANES INSPECTION CHECKLIST

- ___ Where designated, fire lanes shall not be less than twenty (20) feet wide at any point, and curves and corners shall be wide enough to permit the passage or operation of all fire equipment owned by the city. The surface of the fire lanes shall be an all-weather surface and shall be of sufficient strength to support all firefighting apparatus used by the fire department.

- ___ All fire lanes and access roads must be maintained by the property owner, which includes painting curbs and placing permanent (NO PARKING FIRE LANE) signs.

- ___ Fire lanes shall be marked with permanent "NO PARKING FIRE LANE" signs.

- ___ Signs shall measure twelve (12) by eighteen (18) inches; have red letters on a white reflective background.

- ___ Signs must be metal construction only, plastic or wooden signs are not acceptable.

- ___ Mounted at a minimum height of four (4) feet to a maximum of seven (7) feet.

- ___ Signs shall be placed along the fire lane at intervals not to exceed one hundred (100) feet.

- ___ The fire lane curbing shall be painted red with three (3) inch white lettering to read "FIRE LANE NO PARKING" at one hundred (100) feet intervals.

- ___ Outlining or painting the fire lane on the roadway surfaces shall be done in red with white letters that read "FIRE LANE" at one hundred (100) feet intervals or as otherwise directed by the fire department.

Gate Inspection

1. Plans and specifications for electric gate systems shall be submitted to the City of Concord Fire & Life Safety Fire Marshal's Office for review and approval prior to scheduling gate inspection. For review permit questions please call 704-920-5517.
2. All gates limiting access will be required to provide emergency access controls for Fire Department entry.
3. The gates shall be designed so that the access roadway or turning radius 55 feet shall not be obstructed by the operation of the gate. Minimum set back from the public streets shall be a distance determined by the City Engineer and allow the emergency vehicle the ability to safely operate the lock box or panel. Turning radius from the public street shall be 55 feet.
4. Clear width of the roadway shall be a minimum of twenty feet clear width on all entrances. Exit roadways shall be a minimum of sixteen feet clear width or larger on all exits. Unless otherwise approved by the fire department.
5. Sub-divisions may have a divided entrance and exit gates. The entrance side shall have a clearance of twenty feet clear width, the exit side sixteen feet clear width.
6. Access controls shall be exterior to the gate and located for activation by the vehicle operator without dismounting from the vehicle. The height of the lock box/control panel shall be sixty-six inches, measured from the finished grad line of the street.
7. The lock box, padlock or key switch must be an approved model utilized by the Concord Fire & Life Safety Fire Marshal's Office and ordered through them as well. Call 704-920-5517.
8. Traffic Preemption opening device shall be on all motorized gates. Opening devices shall be of an approved type. Specifications shall be submitted to the FMO prior to installation.
9. Gates must fully open with fifteen seconds of activation and remain in the open position until closed by operation of the electrical control device.
10. The control pedestal must be identified with a minimum six inch by ten-inch sign with red letters on a white background. This sign must be securely fastened to the pedestal and legible from the approaching vehicle. "EMERGENCY FIRE DEPARTMENT ACCESS".
11. Battery backup for all motorized gates is required, unless the gate fail safe (open) in the event of a power failure.
12. Secondary "EXIT ONLY" gates shall be set up for Fire Department emergency accesses. Exit only gates, which are not motorized, shall be installed per City of Concord Fire & Life Safety detail. Details are available at the City of Concord Fire & Life Safety Fire Marshal's Office by calling 704-920-5517. Exit only gates shall have a minimum clearance of twenty (20) feet clear width and be posted with a sign that states "CAUTION GATE OPENS OUT". The ground shall be painted with a yellow strip showing the depth of the gate swing.
13. Operation at the gate shall be by preemption device and key switch, code or audible.

Fire Hydrants and Water Supply

05.02

Needed Fire Flow shall be determined by IFC Appendix B or the ISO Method

Sec. 34-90. Code requirements for fire service water mains, fire hydrants and fire connections on private property.

- (a) Fire service water mains.
 - (1) Fire service water mains shall be installed in accordance with approved plans and the city engineering and water resources department requirements and specifications for water main construction. Fire service mains shall also be installed in accordance with the National Fire Protection Association standard for the installation of Private Fire Service Mains and Their Appurtenances, NFPA 24, 1992 edition. Conflicting provisions of the city engineering and water resources department specifications and NFPA 24 requirements should be reported to the city fire prevention bureau.
 - (2) Fire service water mains, water meters and other appurtenances shall be designed to provide at least 80 percent of the minimum required fire flow at 20 pounds per square inch residual pressure at the hydraulically most difficult fire hydrant.
 - a. It is assumed that other fire hydrants, if provided, will provide a greater quantity of water at the same residual pressure.
 - b. When all residential buildings in a multifamily complex are provided with approved residential fire sprinklers, the required fire flow will be reduced 65 percent.
 - (3) The required fire flow will be determined utilizing the insurance services office publication, Guide for Determination of Required Fire Flow, 1980 edition.
- (b) Fire hydrants. Fire hydrant coverage shall not exceed 500 feet to the most remote point of any buildings.
 - (1) For proper measurement, start at the fire hydrant and measure along the same path of travel as a fire truck would use. Do not measure according to the term "as the crow flies."
 - (2) Fire hydrants should not be placed at more than 1,000-foot intervals.
 - (3) The approach route of firefighting apparatus should be kept in mind as fire hydrant locations are determined. Fire hydrants should be located so that the fire apparatus will not have to go past the fire to catch a fire hydrant, then double back to the fire.

- (4) Fire hydrants shall be installed and painted according to the city engineering and water resources department specifications.
 - (5) Each fire hydrant must be readily visible and within six feet of the curblineline. No obstructions are permitted between the hydrant and the curblineline.
 - (6) Fire hydrants should be a minimum of 50 feet from the protected building.
 - (7) All obstructions, such as fences, trees, shrubs, signs, etc., shall be at least three feet from the fire hydrant in all directions. The city shall have the right to cut, trim or remove obstructions to the extent and for the purpose of correcting such hazards.
 - (8) The 4 1/2-inch connection of the fire hydrant shall always face the curb.
 - (9) The nut of the 4 1/2-inch hydrant cap shall be no less than 18 inches nor more than four feet above grade.
- (c) Fire department connections. The fire department connections for standpipe or sprinkler systems are important supplements to normal water supplies. Under fire conditions, these devices permit the fire department to increase the water supply and pressure to fire protection systems which may be materially reduced by a larger number of sprinklers operating or by the use of hose streams from standpipe risers.
- (1) Minimum size pipe shall be four-inch diameter.
 - (2) All fire department inlet pumper connections shall have, at least, 2 1/2-inch female swivel connections with National Standard threads and protective caps.
 - (3) The fire department connections at buildings provided with more than two standpipe risers shall have one 2 1/2-inch female swivel connection with National Standard threads, for each additional standpipe riser.
 - (4) All fire department connections shall be located not less than 18 inches, nor more than five feet above finished grade.
 - (5) All fire department connections shall be provided a clear space of ten feet horizontally and vertically in all directions.
 - (6) All fire department connections shall be readily visible and not more than 50 feet from a street, fire lane or similar area providing access to fire department apparatus. The area between the connection and vehicular access shall be free of obstructions.
 - (7) There shall be an approved pumper fire hydrant within 200 feet of the fire department connection measured along an approved path of travel for the fire apparatus.
- (Code 1987, § 6-55)

Fire Hydrant Flow Test Inspection Process

05.03

The proper method of conducting a fire hydrant flow test is to use two hydrants in the vicinity of the property. The static pressure should be measured on the hydrant in front of or nearest to the property and the water allowed to flow from the hydrant next nearest the property, preferably the one farthest from the source of supply if the main is fed only one way. The residual pressure will be that indicated at the hydrant where water is not flowing.

Test Scheduling and Process

1. All flow tests shall be conducted during the “peak” water demand times. Peak water demand for the City of Concord has been determined by the Water Department to be Monday thru Friday between the hours of 7:00 AM and 7:00 PM.
2. Call (704) 920-5517 to schedule all fire hydrant flow tests. An inspector will schedule your test for the first available date.
3. All necessary precautions shall be taken to avoid any damage that the flow test may incur. It is the responsibility of the individuals whom are conducting the flow test to cleanup and or repair any damage that occurs.
4. Open a 2.5-inch discharge outlet and flow water from the hydrant. Flow hydrant until the water is clear.
5. Attach a gauge to the 2.5-inch discharge outlet on the hydrant in front of or nearest to the property.
6. Ensure all non-used caps on fire hydrant are tight and secure before opening any fire hydrant.
7. Fully open the hydrant to obtain static pressure.
8. Attach an approved flow test diffuser* to one of the 2.5-inch discharge outlets of the flow hydrant.
** Flow test diffuser – An approved flow test diffuser is a special tool that is specifically designed for conducting fire hydrant flow tests. It has a built-in pilot tube and pressure gauge. By diffusing the water flowing from the hydrant it minimizes water damage. Because this device is firmly affixed to the flow hydrant it will produce a more accurate reading of the pitot pressure than that of old conventional hand held methods of flowing testing. In short, a very accurate and dependable test result is produced when the flow test diffuser is used to conduct the fire hydrant flow test.*
9. Completely open the flow hydrant and read and record the pressure at both hydrants.
 - a. When flow hydrant is completely opened read the gauge of the hydrant in front of or nearest to the property to obtain and record the residual pressure.
 - b. When flow hydrant is completely opened read the gauge of the flow hydrant to obtain the pitot pressure. The pitot pressure will be used to compute the gallons per minute of water flowing.
10. Upon completion of the test, fax a computer-generated report indicating gallons that will flow at 20 psi after fire hydrant flow test has been completed. Fax the report to (704) 782-3488 to the attention of the fire inspector whom witnessed the flow test.
11. A fifty-dollar (\$50.00) fee will be required prior to conducting the fire hydrant flow test if the test is conducted by Fire Marshal’s Office personnel.

2. Upon being contacted the inspector shall:
 - a. Observe all underground piping to insure items such as Thrust Blocks, Restraint Collars and any other installation items have been properly installed. It shall be the responsibility of the inspector to permit the burying of piping. Any piping found to be buried shall be excavated and inspected.
 - b. All underground piping between the OS&Y valve at the backflow prevention devices and the base of the sprinkler/standpipe riser(s) shall be pressure tested to a minimum pressure of 150 psi. This pressure shall be maintained for at least two (2) hours. The inspector shall witness the initial pressure. At the end of the test, the inspector shall witness the ending pressure. In order for a test to be successful there shall be no pressure drop between the initial and ending pressure. Any underground piping failing the above test criteria shall be repaired and retested.
 - c. An inspection report shall be filled out and submitted after the inspection.

PRIVATE FIRE SERVICE MAINS

Project Name _____ **Contractor** _____
Dates _____ / _____ / _____ **Witness Initials** _____ / _____ / _____

All private fire service mains shall be installed in accordance with NFPA 24 and the State of North Carolina regulations.

All work has been completed, or supervised, by a State Licensed Fire Sprinkler Contractor.

Name of the sprinkler contractor _____

Public mains supplying private fire service mains are at least 6-inches in diameter.

At least one listed control valve has been installed between the public main and the private main.

The top of the pipe is buried not less than 1-foot below the frost line. Depth of bury is _____ ft.

All bolted joint accessories have been cleaned and thoroughly coated with asphalt or other corrosion-retarding material approved for the application.

All tees, plugs, caps, bends, and hydrant branches have been restrained against movement.

If thrust blocks are used, there is enough bearing to ensure adequate resistance for the thrust encountered. If other method is used, please describe _____

Does this meet NFPA 24 standards? _____

Mains and lead-in connections to system risers have been flushed thoroughly for _____ minutes @ maximum flow rate available.

Trench has been backfilled between the joints before hydro-test, to prevent movement of pipe.

The private fire service main has been hydrostatically tested @ not less than 150 psi for 2 hours, and the amount of leakage does not exceed the limits stated in NFPA 24, sections 9-2.3.2 and 9-2.3.3

No additives, corrosive chemicals (such as sodium silicate), brine, or other chemicals have been used during hydro testing, or for stopping leaks.

~~~ COMPLETE THIS SECTION AFTER ALL ABOVE ITEMS HAVE BEEN CHECKED OFF AND WITNESSED BY A MEMBER OF THE FIRE PREVENTION BUREAU ~~~

To the best of my knowledge, the information I provided is true and correct. This private fire service main has been installed in compliance with NFPA 24 and the State of North Carolina regulations.

INSTALLER'S SIGNATURE **DATE** _____

CITY REPRESENTATIVE (WITNESS) **DATE** _____

Test & Maintenance Report – PRIVATE FIRE HYDRANT

Business/Property Information

Business/Owner Name: _____
 Contact Person: _____ Phone No.: _____
 Address: _____ City, State & Zip: _____
 Type of Business: _____
 Hydrant No.: _____ Location: _____

Please be advised that we (owner/contractor) have made the following maintenance and test of the fire hydrant in accordance with the Statewide Fire Prevention Code, National Fire Protection Association NFPA 291. This form must be completed for each hydrant located on the premises.

24 HOURS PRIOR TO FLOWING ANY PRIVATE FIRE HYDRANT, NOTIFY THE FIRE DEPARTMENT PREVENTION BUREAU OFFICE Phone 704-920-5517

Report of private fire hydrant service condition (new installation, annual and 5-year flow test):

Criteria	Status (Pass/Fail)	Corrective Action (identify)
Accessibility (clear/unobstructed space all around private fire hydrant shall be not less than three feet)		
Leaks in outlets or at top of hydrant (no leakage allowed)		
Proper drainage from hydrant barrel		
Cracks in hydrant barrel/flange		
Tightness of outlets (wrench tight)		
Worn nozzle threads		
Worn hydrant operating nut		

IF THE PRIVATE HYDRANT IS FOUND NOT SERVICEABLE, IMMEDIATELY NOTIFY THE FOLLOWING CITY DEPARTMENT: Dept. of Public Utilities Operations &/or Call Center Phone (704) 920-5555

Barrel Flow Test (new installation or annual):

Hydrant fully opened? Y N All foreign material cleared? Y N Flow duration greater than one minute? Y N
 Full drainage from barrel in less than 24 hours? Y N
 (Observed from 4 1/2" outlet) Pump out required? Y N

Maintenance (new installation or annual):

Weeds and obstructions cleared from within three feet of hydrant? Y N Hydrant caps and threads inspected? Y N
 Rust and scale removed? Y N Lubricated? Y N
 Painted? (Bonnet – Royal Blue #7727), (Caps – Royal Blue #7727 or Lemon Yellow #7743 if hydrant opens counter-clockwise)
 (Barrel – Regal Red #7765) **All paints shall be Rust-Oleum brand, or equal**

Flow Test (new installation and once every five years thereafter): (Use 2 1/2 # outlet for testing)

Apparatus used this test: _____ Pitot Reading PSI: _____ GPM: ____
 Flow available @ 20 PSI: _____ Residual Pressure: _____ Static Pressure: ____

Certification: I hereby certify the foregoing data to be correct and the statements to be true.

Test Company: _____ Phone No.: _____ Fax No.: ____
 Address: _____ City, State & Zip: _____
 Tester's Name (Print): _____ Tester's Signature: _____
 Test Date: _____ Contractor's Lic. #: _____

NEW INSTALLATION, THIS FORM IS TO BE SENT TO: City of Concord P O Box 308 Permit & Inspections Concord, NC 28025-0308 Engineering Department (704) 920-5401	EXISTING INSTALLATION, THIS FORM IS TO BE SENT TO City of Concord Fire Prevention P O Box 308 Bureau Chief's office Concord, NC 28025-0308 Attn: Cindy (704) 920-5517
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CABARRUS COUNTY

SETTLEMENT AGREEMENT AND RELEASE

NORTH CAROLINA

This SETTLEMENT AGREEMENT AND RELEASE ("Agreement") is entered into this the _____ day of _____, 20____, by and between the CITY OF CONCORD ("Concord"), a North Carolina municipal corporation and _____, (hereinafter "Releasee(s)");

WITNESSETH

WHEREAS, the Releasee(s) own _____; and

WHEREAS, Concord _____; and

WHEREAS, Concord inadvertently _____.

Now, therefore, in consideration of the mutual obligations and undertakings hereinafter set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. Release of Claims Against Concord. In consideration of the amounts paid hereunder and promises herein agreed to by Concord, the other parties hereto, for themselves and their heirs, assigns, successors, representatives, agents and attorneys, hereby irrevocably and unconditionally RELEASES, ACQUITS, AND FOREVER DISCHARGES Concord and its officers, elected officials, employees, agents and representatives, and the heirs, successors and assigns of all such persons or entities and all persons acting by, through, under, or in concert with any of them (collectively "Releasees"), or any of them from any and all charges, complaints, claims (whether in law or equity or whether under statutory or common law of the United States or any state thereof), Liabilities, controversies, actions, causes of action, suits, judgments, demands, costs, losses, debts, interest, damages (of any kind whether actual, punitive, compensatory, double, treble or nominal), and expenses (including attorney's fees and costs actually incurred), which the parties or any of their heirs, representatives or assigns ever had, now have, or which may later appear or accrue, for any losses, injuries or damages, whether anticipated or unanticipated, resulting from, arising out of or connected directly or indirectly with any action or omission of the Releasees arising out of any transactions with the Releasee(s) prior to or as of the date of this Agreement and specifically including _____. The parties hereby represent that they have not assigned to any third party any claim they might have against the Releasees. All parties hereby covenant and agree that they will not initiate any lawsuit or proceeding against any of the Releasees with respect to any of these released claims and agrees to indemnify the Releasees from any expense, cost or damage incurred in connection with any action initiated by any party in violation of the covenants contained in this paragraph.

As Consideration for this Agreement, Concord hereby agrees to pay to the Releasee(s) the sum of _____ Dollars and _____ Cents (\$ _____)

3. No Liability Admitted. This Agreement shall not in any way be construed as an admission of any liability by any party to any other party, it being expressly acknowledged that all allegations at issue have been and continue to be sharply disputed. The parties are entering into this Agreement merely to avoid further litigation and buy their peace.

4. No Disparaging Remarks. The parties hereby agree that they will not make any disparaging remarks to anyone about Concord, of its elected officials or employees, at anytime hereafter, regarding any of the events leading up to the date of this Agreement. Concord similarly agrees that its elected officials and management employees will not make any disparaging remarks to anyone about the parties regarding any of the above events, at any time hereafter.

5. Costs and Fees. All parties hereto will bear their own respective costs, if any, relating to all disputes between the parties prior to the date of this Agreement, including attorneys' fees, and no party shall be liable to any other party for any costs or attorneys' fees.

6. Voluntary Agreement. The parties warrant that they have had ample time to consider this Agreement and they understand its provisions. The parties represent that they enter into this Agreement voluntarily.

7. Entire Agreement. This Agreement contains the entire Agreement and understanding between the parties with respect to the subject matter hereof and supersedes all preexisting and/or oral agreements between them respecting the subject matter hereof. All representations and promises made by a party to another party whether in writing or orally are understood by the parties to be merged into this Agreement. This Agreement may only be modified or amended in writing and shall not be subject to oral modification. If any portion of this Agreement is held by any court of competent jurisdiction to conflict with any federal, state or local law, and as a result, such portion or portions are declared to be invalid, all remaining portions of this Agreement shall otherwise remain in full force and effect as if the invalid portions had not been contained herein. This Agreement shall be governed and construed in accordance with the laws of the State of North Carolina.

8. Time of the Essence. Both parties specifically acknowledge and agree that time is of the essence in the execution and performance of this agreement. Both parties do further agree that this agreement is null, void and of no effect if not fully executed by both parties by 5:00 PM on _____, 20__.

THE UNDERSIGNED HAVE READ THE FOREGOING SETTLEMENT AGREEMENT AND RELEASE AND REPRESENT TO EACH OTHER THAT THE FULLY UNDERSTAND IT AND INTEND TO BE BOUND BY IT.

Signed and sealed in duplicate originals and delivered this the _____ day of _____, 20__.

THE CITY OF CONCORD, NORTH CAROLINA

By: _____
Brian Hiatt, City Manager

ATTEST:

Vickie Weant, City Clerk

Approved as to Form:

Albert M. Benschhoff, City Attorney

This instrument has been preaudited in the manner required by the "Local Government Budget and Fiscal Control Act."

Joyce Allman, Finance Director

(SEAL)

(SEAL)

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public in and for said county and state, do hereby certify that _____ personally appeared before me this day and acknowledged the due execution of the foregoing Agreement.

WITNESS my hand and seal, this ____ day of _____ 20__.

Notary Public

My commission expires: _____