Contractor's Guiding Principles

New Construction Inspection Procedures

Office of the Fire Marshal
Kellie M. Krujaick, Fire Marshal

January 2023


OSCEOLA COUNTY
62
LADDER
62
EMERGENCY
PARAMEDICS

New Construction Inspection Procedures

Guiding Principle

To ensure consistency throughout the inspection process for all fire protection systems and building designs, Osceola County Fire Marshal's Office has compiled a checklist outlining the **minimum** inspection benchmarks required to be met prior to scheduling a fire inspection.

Procedures

Fire Safety During Building Construction (NFPA 1/NFPA 241)

1. Fire department access is provided.
    A. Stabilized all-weather capable surface.
    B. Clear width through fences, gates, and arid roadways.
    C. Turnarounds are provided for permanent or temporary dead-ends >150'.
2. Fire extinguishers are provided in accordance with NFPA 10 (current edition).
3. Fire hydrants and water distribution system(s) completed prior to going vertical with construction and/or storing combustibles on site.
4. NFPA 101, Life Safety Code compliant stairs with lighting when above the first floor.
5. A standpipe system, either permanent or temporary, shall be installed and extended up with each floor and shall be securely capped. The standpipe shall be provided with conspicuously marked and readily accessible fire department connection(s) on the outside of the building at the street level and shall have at least one standard 2.5-inch hose inlet.
6. FD access door leading to the interior of the building is within 50' of FD access road; 150' around the perimeter (450' for buildings equipped with an automatic sprinkler system).
7. Ensure no cooking devices are being used inside the construction area

Building Fire Final

1. Confirm shop drawings are approved and permit and permit card are on the job site.
2. General Building Features
    Verify:
    A. Fire department access is provided to the building.
    B. Monitored FD lock box is installed within 10 feet of the publicly recognized main entrance/exit access point to the building between 4 feet to 6 feet AFF.
    C. Building is adequately addressed with signage.
    D. All hydrants, valves, FDCs, and appurtenances have proper clearance/striping/signage.
    E. Underground mains and hydrants are installed, approved, and in service.
    F. Fire extinguishers are provided in accordance with the plans.
    G. Fire hydrant(s) > 40' from the building it serves.
    H. In Building Public Safety Radio Enhancement System requirements have been met through a "Passing" Radio Frequency (RF) Study by a licensed engineer (unless exempt by F.S. 633).
3. Collect Contractors' paperwork for all Fire permits after approval.

New Construction Inspection Procedures

Osceola County Department of Fire Rescue and Emergency Medical Services
Office of the Fire Marshal
1 Courthouse Square, Kissimmee, Florida 34741
Phone: 407-742-6700 Email: osceolafiremarshal@osceola.org

Fire Alarm System (NFPA 72)

1. Confirm that the shop drawings are approved.
2. Verify panel is online and clear.
3. Call dispatch (407-348-8688) with your location and status.
4. For new flow switches and tamper switches, verify operation.
5. Verify that County dispatch has received an alarm signal.
6. Place the alarm system in “Test Mode” to prevent further signals to dispatch.
7. Conduct Fire Alarm Operations Test.
8. FD lock box is monitored by the fire alarm system and a Fire Department Access permit has been obtained and finaled out.

Sprinkler System (NFPA 13)

1. Confirm that the shop drawings are approved

Verify:

a. Sprinkler system fire permit is finaled.
b. Sprinklers are correctly installed, as shown on the approved plans.
c. All escutcheon plates are correctly installed.
d. Hydraulic nameplates are installed on each riser.

Building Life Safety Systems (NFPA 101)

1. Confirm that the plans are approved.

Verify:

a. Travel distances/common paths are in accordance with NFPA 101.
b. Changes in the level in the means of egress by ramp/stair.
c. Trip hazards.
d. Handrails/Guardrails for elevation changes.
e. Obstructions to clear the width of doors/corridors/exits.
f. Exit signs are visible and legible within 100’ of all points in exit access.
g. Exit signs at each exit.
h. Exit tactile signage is provided at each exit.
i. Exit stair identification sign provided for buildings > 4 stories.
j. Exit stair construction is rated, continuous, and enclosed.
k. Exit stairs/ramps contain handrails and guardrails.
l. Exit stair tactile and stair identification signage is provided.
m. Panic hardware is provided on Assembly, Educational, and Day-Care exit doors.

Building Fire Final (Cont'd)

a. All fire-rated doors are auto-closing, latching, and listed.
b. Door opening forces (30 lbf to start; 15 lbf to open).
c. Exit discharge to a public way.
d. Fire-rated construction has listed assemblies.
e. Fire command center is 1 hr. rated; controls and status indicators.
f. Emergency generator system meets NFPA 110.
g. Automatic transfer to emergency power < 10 seconds.
h. Emergency lighting is provided in the means of egress.
i. Illumination at floor level of egress path is at least 1 ft-candle; max contrast 40:1, no less than 0.2 ft-candle with outage.
j. Illumination outside the building extends to the public way.
k. Occupant load signs have been placed near the main exit and each area in assembly occupancies; they must match approved plans
l. Access control systems meet LSC.
m. Elevator lobbies have a means of egress.
n. Finish materials to meet LSC.
o. Furniture layout meets to plan for all assemblies.

Fire Alarm Operational Test (NFPA 72)

1. Confirm shop drawings are approved, and permit on the job site.
2. Compare permit to approved plans.
3. Verify panel is online and clear.
4. Verify device types and locations match approved plans:
    A. End-of-line resistors.
    B. Circuitry components, conductors, junction boxes (low-voltage ELE permit req.).
    C. Power supply and alarm panels.
    D. Notification appliances:
        i. Strobes.
        ii. Horns.
        iii. Speakers.
    E. Initiation devices:
        i. Manual pull stations.
        ii. Smoke detectors.

Fire Alarm Operational Test (NFPA 72, cont'd)

iii. Heat detectors.
iv. Beam smoke detectors.
v. Sprinkler flow switches.
vi. Flame detectors.

Verify:

1. Date on batteries within three years.
2. Zone map is available.
3. Control panel legend and signage.
4. Phone numbers for emergency contact persons.
5. Account numbers.

5. Call dispatch (407.348-8688) with your location and status.
6. Conduct operational test:
   a. Test initiation devices and verify response by County dispatch.
   b. Place the system in "Test Mode" with the central station.
   c. Test all initiation devices (10% for recert.) for appropriate signals and description

Verify:

1. Operation of trouble and ground faults on initiation and notification loops (200 sec to trigger and restore).
2. Supervisory tamper switches on control valves operate.
3. Sound level using dB meter exceeds 15 dB over ambient.
4. Visual notification devices produce at least 75 candelas except in corridors.
5. Visual notification device within 15' of the end of corridors.
6. Shut down of AHU on local smoke detection activation.
7. Monitoring of new subsystems to building fire alarm system (90 sec.).
8. Monitoring of fire pump arid emergency generator supervision.
9. Access control systems release in the means of egress.
10. Fire-rated doors on auto-closers or door hold-opens close release.
11. Operation of elevator recall upon activation of the elevator lobby, machine room, or shaft smoke detector.
12. Access control devices release on egress components.
13. Smoke damper detectors activation closes the damper.
14. Voice evacuation is audible/intelligible.
15. Interface with audio/visual effects shunts to eliminate confusion.
16. Elevator recall service.

7. Contractor's NFPA 72 Record of Completion forms collected at BLD Fire Final.

Operational Test - Kitchen Hood Dry/Wet Chemical Agent Suppression System (NFPA 17/17A)

1. Confirm shop drawings are approved, and permit on the job site.
2. Compare the permit to the label on the back sheet of approved plans.
3. Verify appliance types and locations match approved plans.
4. Verify proper nozzle installation (height, orientation, placement).

    Perform manual pull station test:

    a. Activate the gas or electric supply of the cooking equipment.
    b. Activate the exhaust and supply fans.
    c. Pull the manual alarm station.

    Verify:

    1. The agent (or test gas) discharges from the nozzles.
    2. The gas or electric source is interrupted.
    3. Supply fan stops and exhaust fan operates.
    4. Activation of building fire alarm.
    5. Activation of local (audible or visual) notification device.

6. Perform link test:

    a. Deactivate supply and exhaust fans.
    b. Ready fusible link or heat detector above systems with a single nozzle.
    c. Ready suppression system.
    d. Manually break the fusible link or trigger the heat detector.

    Verify:

    1. The agent (or test gas) discharges from the nozzles.
    2. The gas or electric source is interrupted.
    3. Exhaust fan activates.
    4. Activation of building fire alarm.
    5. Activation of local (audible or visual) notification device.

7. Contractor's system certification forms collected at BLD Final.
8. Witness the contractor tagging the equipment.

Operational Test — Alternate Gaseous Suppression Agent (NFPA 12/NFPA 2001)

Verify:

1. Plans; Permit
2. Enclosure
3. Nozzles
4. Agent release/storage
5. Fire alarm pre-signal/notification
6. Communication with building FACP

Operational Test — Fire Pumps (NFPA 20)

1. Confirm shop drawings are approved, permit on Jobsite.
2. General Inspection:
   - A. Pump manufacturer, engine manufacturer, controller manufacturer, and transfer switch manufacturer (or their respective representatives) shall be present during the test.
   - B. A copy of the fire pump acceptance test data paperwork must be received before the fire pump inspection request.
   - C. All electrical wiring to the fire pump motor, including controllers, emergency power supply, and jockey pump, must be completed, inspected, and approved.
   - D. The manufacturer shall provide a certified pump test characteristic curve for comparison to acceptance test results.
   - E. The fire pump shall be operated for at least 1-hour cumulative time during the acceptance testing.
   - F. The fire pump or controlling equipment shall not experience overheating, excessive vibration, or overcurrent during the acceptance testing.
   - G. Alarm conditions shall annunciate locally and through the building fire alarm system for the fire pump, controller, and control valves (phase or power loss, phase reversal, pump running, transfer switch in an emergency).
   - H. The fire pump must have a nameplate, suction and discharge gauges, and a suitable means to discharge and calibrate flow during a flow test (exterior test header with hose outlets as specified by NFPA 20, Table 5.25).
   - I. The fire pump must have a pump bypass configuration.
   - J. Reducers on the pump suction must be eccentric.
   - K. Elbows installed in the parallel plane of a horizontal split-case pump shall be placed at least 10 supply pipe diameters in the distance from the pump suction.
   - L. A check valve is required in each fire and jockey pump discharge assembly.
   - M. All flow meters and arid gauges must be calibrated within the past 12 months.
   - N. The jockey pump must stop at the fire pump churn pressure plus the minimum City static supply.
   - O. The jockey pump must start at the jockey pump stop pressure — 10 psi.
   - P. The fire pump must start at the jockey pump stop pressure— 5 psi.
   - Q. The fire pump will return to normal state at the rated pressure plus the minimum City static. A timed automatic shutoff is permitted once the pump returns to its normal state, and a runtime of 10-minutes for electric and 30-minutes for engine driven is complete.
   - R. Contractor's Certification paperwork collected at BLD Fire Final.
3. Fire Pump Protection and Enclosure
   - A. The fire pump must be separated by 2-hour fire-rated construction from all areas of the building (1 hour if the building is not a high-rise and fully sprinkler protected) or separated from the structure by at least 50 feet.

Operational Test — Fire Pumps (NFPA 20, cont'd)

1. The fire pump must be secured against unauthorized personnel.
2. The enclosure must reliably maintain at least 40°F but not exceed 120°F.
3. The fire pump room must have emergency lighting.
4. The fire pump room must have ventilation.
5. The fire pump room must have drainage and an elevated pad at least 12" high for all electrical components.
6. An entrance must be at least 24" wide and 6'-6" high for access.
7. All electrical equipment must have at least 30" clear in front.
8. Diesel-driven fire pumps must have a fuel tank capacity based on 1 gallon per bhp of the pump plus an additional 10%.
9. Flow Test
    a. Start the pump (simultaneously testing alternate power or batteries).
    b. Regulate flow vary discharge, obtaining at least the churn, 100% capacity, and 150% capacity flow points. (Do not allow the suction side to drop below 2Opsi. The system should not fail for not achieving 150% capacity. However, the system should minimally exceed the highest demand of the fire protection system. Most pumps are sized to accomplish this between 90% and 150% capacity.)
10. Record the following information for each flow point:
    a. Pump RPM.
    b. Suction pressure.
    c. Discharge pressure.
11. Number and sizes of hose nozzles (obtain the GPM via pitot or flow meter).
12. Volts.
13. Plot pump characteristic curve

P pump = P discharge – P supply

Flow Test Point (% Rated Capacity)	Min Total Head (% Rated P)	Max Total Head (% Rated P)
0	100	140 (or shutoff)
100	100	140 (or shutoff)
150	65	140 (or shutoff)

14. Electric-Driven Fire Pumps
    A. Loads Start Test – Start the pump and bring it up to the rated speed under discharge equal to the peak load
    B. Phase Reversal Test – Test for phase reversal under normal and alternate power supplies.

15. Controller Acceptance Test

Operational Test — Fire Pumps (NFPA 20, cont'd)

16. Perform at least 6 automatic and 6 manual operations during the acceptance testing.
17. Operate the driver at full speed for at least 5 minutes per operation.
18. Automatic operations must include testing from all provided starting features (pressure switches or remote starting signal).
19. Divide operations between both sets of batteries for engine-driven pumps.
20. Start the fire pump from each power source for electric-driven pumps.
21. Half of the operations must be performed with the fire pump connected to the alternate source. (Switch over to the alternate source must occur within 10 seconds, with the peak flow established within 20 to 30 seconds.)

Underground Main – Visual (NFPA 24)

1. Confirm that the shop drawings are approved, and permit on the job site.

Verify:

1. Materials are consistent with approved plans and can resist 200-psi hydro.
2. All metallic joints and restraints are corrosion-resistant.
3. All pipes and joints are correctly restrained.
4. Depth of cover is at least 30", 36" under driveways, and 48" under railroads.
5. Hydrants:
    a. Are connected to at least a 6" main.
    b. Are no closer than 50' from the building of service.
    c. Are within 40' of the fire department connection.
    d. Are installed within 5' of a fire department access road.
    e. Have a center hose outlet not less than 18" ABOVE FINAL GRADE.
    f. Do not have obstructions within 7'-6" of side ports and 4' to the rear.

2. Backflow prevention devices are consistent with the approved plans.
3. Control valves:
    a. Are consistent with the approved plans.
    b. Contain electronic supervision if a fire alarm system is installed.
    c. Include a post-indicating valve from every connection to a building.
    d. Are not provided in the path of a fire department connection.

Underground Main – Flush (NFPA 24)

1. Confirm that the shop drawings are approved, and permit on the job site.
2. Provide a suitable location for the discharge of water.
3. Restrain all piping to prevent damage.
4. Open valves to generate flow according to the following table:

Nominal Pipe Size (in.)	Flow Rate (GPM)
4	390
6	880

Underground Main – Flush (NFPA 24, cont'd)

8	1560
10	2440
12	3520

1. Continue flushing operation until the foreign matter is cleared.
2. Close the control valves.

Underground Main – Hydro (NFPA 24)

1. Confirm that the shop drawings are approved, and permit on the job site.
2. Backfill the trench between joints to prevent movement.
3. Verify that the contractor has maintained a pressure of 200 psi for at least 2 hours.
4. No loss of pressure allowed.
5. Relieve all pressure and observe the gauge for proper operation.
6. Contractor certification paperwork collected at BLD Final.

Above-ground Hydro – Sprinkler (NFPA 13)

1. Confirm that the shop drawings are approved, and permit on the job site.
2. Verify that the contractor has maintained pressure of 200 psi or 50 psi above the system pressure (churn pressure available for fire pumps) for at least 2 hours.
3. Determine the applicable sprinkler standard (NFPA 13, 13R, or 13D).
4. Verify that location and materials are consistent with the approved plans:
    a. Piping
        i. Risers.
        ii. Cross mains.
        iii. Branch lines.
    b. Fittings
    c. Valves
    d. Gauges
    e. Sprinklers
        i. Types.
        ii. Temperatures; RTI.
        iii. Spacing.
    f. Corrosion Prevention
5. Verify piping exposed to temperatures below 40°F nominal is protected against freezing (dry heads, dry-pipe system, heat trace on mains, ethylene-glycol).
6. Verify that piping is restrained correctly in accordance with the following chart:

Pipe Diameter (in.)	1	1 1/2	1 1/2	2	2 1/2	3	4+
Steel pipe (except threaded lightwall)	12'	12'	15'	15'	15'	15'	15'

Above-ground Hydro–Sprinkler (NFPA 13, cont'd)

Threaded lightwall	12'	12'	12'	12'	12'	12'	15'
Copper tube	8'	8'	10'	12'	12'	12'	15'
CPVC	6'	6'6"	7'	8'	9'	10'	N/A

7. Verify hangers are provided in other locations:
    a. Every segment of a branch line.
    b. Within 36' of an end sprinkler for 1" pipe.
    c. Within 48" of an end sprinkler for 1 ¼" pipe.
    d. Within 60" of an end sprinkler for 1 ½" or larger pipe.
    e. Within 12" of an end sprinkler where the maximum pressure exceeds 100 psi at the sprinkler head (generally if connected to a fire pump).
8. For dry pipe and pre-action systems, an air pressure leakage test at 40 psi is conducted for 24 hours.
    a. Maximum leakage allowed is 1 ½ psi.
    b. Hydrostatic pressure at least 200 psi or 50 psi above system pressure is required if connected to an FDC.
9. Relieve all pressure and observe the gauge for operation, the gauge at the lowest point on the system.

Operation Test – Sprinkler/Standpipe (NFPA 13/14)

1. Confirm that the shop drawings are approved, and permit on the job site.
2. For sprinkler systems:
    a. Verify that all alarm and supervisory devices are monitored:
        i. Water Flow switches.
        ii. Pressure switches.
        iii. Control valve supervisory switches.
        iv. Alarm valves.
        v. Local notification (for systems > 20 heads).
    b. Verify the operation of the system:
        i. Flow from inspector's test connection – alarm in less than 5 min. And water.
        ii. Delivered from a dry pipe within 60 sec. (for dry pipe systems, more than 750 gallons).
        iii. Trip each pressure switch.
        iv. Open the main drain valve and record static and residual pressure.
3. Obstructions to sprinkler discharge eliminated.
4. Sprinkler distance to the ceiling.
5. Hydraulic nameplates on each system riser.
6. Contractor's NFPA 13 system certification paperwork collected at BLD Final.

Operation Test – Sprinkler/Standpipe (NFPA 13/14, cont'd)

7. For Standpipes
    A. Verify fire hose valves are accessible.
    B. Verify that each standpipe control valve is supervised and works properly.
    C. Verify that a suitable means for discharge is provided (3" drain riser or exterior access for flow test and drain).
    D. Verify two 2-1/2" outlets are provided at the most remote riser.
    E. Verify each additional riser has a 2 ½ riser at the roof if access is not provided or an outlet at the top of the stairs that access the roof.
    F. Verify pressure-reducing hose valve inlet and outlet pressures static; residual; flow using the approved device.
    G. Verify through flow test:
        A. 500 GPM @ 100 psi at the roof manifold from the most remote riser.
        B. 250 GPM @ 100 psi for two successive remote risers up to 1000 GPM for a combined system.
8. Hydraulic nameplates on each system riser.
9. Contractor's NFPA 14 system certification paperwork collected at BLD final.

If you have any questions or comments regarding the information contained within, or if you need assistance interpreting these requirements, please contact:

Osceola County Fire Rescue and Emergency Services
Office of the Fire Marshal
1 Courthouse Square, Kissimmee, Florida 34741
Phone: 407-742-6700
osceolafiremarshal@osceola.org

Office of the Fire Marshal
Kellie M. Krujaick, Fire Marshal
January 2023