

Cleveland Fire Department



Cleveland Fire Department
Submittal Requirements for:
Architects and Engineers
Approved July 1, 2022:
Chris Bates
Fire Marshal

Executive Summary

“The Mission of the Cleveland Fire Department is to serve the citizens and guests of the City of Cleveland by protecting life, property, and the environment from incidents involving fire, rescue, hazardous materials, and other emergencies, both manmade and natural. This will be accomplished through code management, public education, and professional emergency management.”



The Cleveland Fire Department’s Fire Prevention Division plays a large part of this mission by the enforcement of the adopted fire codes. Part of this enforcement comes from a progressive approach to new construction. The following manual will describe the minimum requirements of the Cleveland Fire Department that are in addition to the requirements of the Building Division of the City of Cleveland Development and Engineering Services Department.

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General

The Cleveland Fire Department, in accordance with the City Municipal Code and the State of Tennessee, has adopted the 2018 edition of the International Fire Code (IFC) and its references. All designs should start from this code. This fire code is the compliment to the city adopted building codes.

All submittals are digital and through the building division, so there is no need to submit to more than one place. Shop drawings are submitted directly to the fire department by the contracted professionals.

The following sections will be reviewed by the Fire Prevention Division:

- Civil
- Life Safety
- Portable Fire Extinguishers
- Automatic Sprinklers
- Fire Alarms
- Alternative Suppression Systems
- Other Fire Protection and Life Safety Features



The fire protection portions of the plans will be reviewed by members of the Fire Prevention Division and then Approved, Approved with Stipulations, or Returned for Resubmittal.

A written report will be given to the submitter regarding each section reviewed.

All fire protection designs (not including civil and life safety) shall be included in a separate section labeled as Fire Protection (FP).

Civil

There are several reasons why the Cleveland Fire Department reviews Civil Drawings. The Cleveland Fire Department requires the following information to be included in these drawings:

- Water Supply
 - Fire Protection
- Fire Hydrants
 - Existing Locations
 - Proposed Locations
- Fire Department Connections
- Fire Lanes and Access Roads

Life Safety

Both the IFC and the International Building Code (IBC) include the same chapters that cover egress. Both the Fire Prevention Division and the Building Division review the submitted Life Safety plan in order to maintain a high degree of safety for building occupants. Illumination and signage regarding egress is also reviewed by the Fire Prevention Division. There is no special illumination and signage submittal requirement. This is reviewed in the normal lighting/electrical sections.

Portable Fire Extinguishers

Portable fire extinguishers are required in most occupancies. The locations of each fire extinguisher are to be designed by the architect in order to ensure compliance. **This is not to be left up to fire extinguisher vendors or fire department personnel to decide.** The design shall include travel distances, heights, and any other pertinent information.

Automatic Sprinklers

Automatic fire sprinklers are an important life safety component in buildings. The Cleveland Fire Department has taken the same “standard of care” used for submittals to the State of Tennessee. Therefore, the Fire Prevention Division requires all buildings under review that are required to have a sprinkler system within the jurisdiction of the Cleveland Fire Department, **include a design concept of the sprinkler system by a professional engineer (P.E.) or architect licensed by the State of Tennessee.** From time to time a P.E. is not required. The table on the following page is a guide to determine when a P.E. is or is not required to submit a design concept.

Condition	P.E. Required	P.E. Not Required
New construction or addition of over 5000 square feet.	X	
Occupancy change Classification	X	
Renovation of existing fire sprinkler system with no occupancy change of classification.		
Light Hazard	226 Heads	Up to 225 heads
Ordinary Hazard	226 Heads	Up to 225 heads
Extra Hazard	226 Heads	Up to 225 heads
High Piled Storage	401 Heads	Up to 400 heads
Upgrading of existing fire sprinkler system with no occupancy change of classification.		
Light Hazard	226 Heads	Up to 225 heads
Ordinary Hazard	226 Heads	Up to 225 heads
Extra Hazard	226 Heads	Up to 225 heads
High Piled Storage	401 Heads	Up to 400 heads
Non-sprinklered Existing Building where code does not require the installation of and automatic fire sprinkler system.		
Light Hazard	226 Heads	Up to 225 heads
Ordinary Hazard	226 Heads	Up to 225 heads
Extra Hazard	226 Heads	Up to 225 heads
High Piled Storage	401 Heads	Up to 400 heads

When a P.E. is required, the following shall be included in the design concept:

- Provide flow test information.
 - Name of person who conducted the flow test.
 - Date and location of test.
 - The test must be less than six months old. If reliable or current information is not available, the engineer should supervise the performance of the new flow test and/or will verify the accuracy of a new flow test during preliminary design.

- Provide preliminary hydraulic calculation results. Provide the following calculations based on NFPA 13 Chapter 11, NFPA 13R Chapter 7, or NFPA 13D Chapter 8:
 - Identify the hydraulically most demanding area of the building.
 - Provide preliminary flow (gpm) and pressure (psi) demand calculations for the greatest demand area. Include the required sprinkler head pressure, sprinkler system piping elevation loss, and friction loss (including device friction loss such as backflow preventers and isolation valves). NFPA 13 Chapter 11.
 - NFPA 13: Density/Area Concept, duration is based upon occupancy hazard.
 - NFPA 13R: 4-head design, 30-minute duration.
 - NFPA 13D: 2-head design, 10-minute duration.
 - Provide a graph plotting the water supply curve (static psi at zero gpm flow and residual psi at gpm flow) and system demand (preliminary calculated point of residual psi at gpm flow) to show that the water supply (fire hydrant test) exceeds sprinkler system water demand for the building.
- Provide details of the system as applicable:
 - Total area protected on each floor.
 - Pipe type and schedule of wall thickness.
 - Type and nominal K-factor of sprinklers.
 - Calculation of loads for sizing, details of sway bracing.
 - Temperature rating of any high-temperature sprinklers.
 - Give the size and location of all risers and mains.
 - Give the location of any small enclosures in which no sprinklers are to be installed.
 - Give the location of any areas where sprinklers are omitted by exceptions of NFPA 13 or 13R.
 - Location of pre-action or deluge valves if applicable.
 - Size and location of standpipe riser and hose outlets.
 - Indicate type of restraints used for underground directional changes. If left up to the sprinkler contractor, list available types and indicate the length, width, depth of thrust blocks.
 - Indicate heat source(s) to protect sprinkler pipe from freezing in non-climate controlled areas.
- Specify that all system gauges and valves must be accessible for operation, inspection, and maintenance. NFPA 13, 8.1.2.
- Provide intent for all supervisory, tamper, and flow monitoring switches.
- Indicate separate electric bell for audible flow alarm.
- Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with section 903.3.1 IFC and their listings in accordance with IFC 903.3.2:
 - Light-hazard occupancies as defined in NFPA 13.
- Specify seismic restraints for sprinkler piping and specify flexible couplings at flexure joints per NFPA 13, 9.3.2.1. Cleveland is designated as a Class C.

- Show clearance around piping passing through concrete floors and concrete/CMU walls and foundation where required. NFPA 13, 9.3.4 and NFPA 13R 6.13.
- Show typical seismic bracing details, locations of 4-way bracing, longitudinal and latitudinal bracing, line restraint bracing, and the clearance required around sprinkler pipe based on pipe size.

Shop Drawings

Shop drawings and calculations should be submitted to the **engineer of record** prior to the submittal to the Cleveland Fire Department. The engineer of record will document the review of the shop drawings, calculations, and manufacturer's cut sheets using a review stamp. This is an engineer's acceptance, acceptance as noted, rejection, or revise and resubmit, etc. of the shop drawings. This is based on review of the shop drawings against the design concept identified in the preliminary plans. The engineer should never place his/her P.E. seal on the sprinkler contractor's drawings or calculations unless he actually prepared them or supervised their preparation. Other items required on the shop drawings are:

- State required contractor information
 - Certificate number of the contractor
 - Date of preparation of shop drawings; and
 - Signature and license number of the responsible managing employee (RME).
- Hydraulic Calculations
- Noted Calculation Area(s)
- Sprinkler Head Locations
- Riser Details
- Product Cut Sheets
- Hot Box Details as required by Cleveland Utilities
- FDC Details
- Seismic bracing details
- Type of underground restraints to be used and the length, width, and depth of thrust blocks according to the design intent.

If a P.E. is not required, the Fire Marshal shall be consulted as to what type of work is being done. As a general rule, shop drawings will be required for the addition of 10 or more heads. Shop drawings are required for renovations where heads will be moved or added due to construction changes. These drawings will be generally used to determine proper head placement. In most cases hydraulic calculations, cut sheets, etc., will not be required for small modifications.

Underground Installation

In some jurisdictions it may be acceptable for plumbers or other contractors to install the underground of a fire protection system. The State of Tennessee rule 7800207.01(g) requires that all underground work exclusively used for fire protection must be installed by a licensed

Tennessee Fire Sprinkler Contractor. This work may not be subcontracted to an unlicensed sprinkler contractor unless the sprinkler contractor's RME is present **at all times** during the installation.

Fire Alarms

Fire alarms are an important life safety component in buildings. To ensure proper installation and compliance, the fire prevention division requires shop drawings of proposed fire alarm systems. Items required with the shop drawings include:

- TN Contractor license
- FACP Location
- Component Locations
- Wiring Plan
- Battery Calculations
- Manufacturer's specifications for all materials used

Alternative Suppression Systems

Alternative fire suppression systems are becoming more common. Any proposed alternative fire protection such as kitchen suppression for grease laden vapors, clean agent systems, water mist systems etc. must be designed by an approved design professional and included in the plans.

Other Fire Protection Features and Needs

Many of the occupancies built in Cleveland will only require general fire protection needs. However, special circumstances may arise that require the design professional to pay careful attention to other features not normally encountered such as high-piled storage or hazardous processes. If it is determined that these types of special needs exist, but are not designed, the fire department will require a resubmittal.

Elevations

Often overlooked in plans submittals are legible, visible street numbers. A detail of street numbers is required on the building elevation plan. Also, to be included is the location(s) of the Knox® rapid entry key box. The Cleveland Fire Department requires a Knox® box on all new buildings.

Fire Stopping

The Cleveland Fire Department requires that any penetrations through rated assemblies be of a listed design in order to properly maintain the designed rating. The details of these designs must be included in the submitted plans. All penetrations will be subject to destructive inspection to ensure workmanship is completed according to design. Third party listed designs are acceptable.

High-Piled Storage

High-piled storage must meet the requirements of Chapter 32 of the IFC 2018. Special attention must be paid to **Table 3206.2**. It should be noted that high-piled storage has more requirements than just an automatic sprinkler system.

