# ARLINGTON FIRE RESCUE

*FIRE MARSHAL'S OFFICE*

# CONSTRUCTION GUIDE
# FIRE SPRINKLER SYSTEMS
## 2021 IFC Edition

**Updated March 2025**

# ARLINGTON FIRE RESCUE

***Fire Marshal's Office***

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# ARLINGTON FIRE RESCUE

*Fire Marshal's Office*

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# GENERAL FIRE PERMIT INFORMATION

The goal of the Fire Prevention Division is to assist its customers in understanding our submittal, plan review and inspection process and policies, as they pertain to new construction and finish outs. Familiarity with and adherence to these guidelines can greatly assist you in compliance with local codes, ordinances and inspections.

This guide does not replace, nor supersede any adopted codes and/or ordinances adopted by the City of Arlington, or determinations and positions of the Fire Chief or Fire Marshal.

To expedite the plan review and inspection processes, please refer to the information below:

1. **All permits shall be submitted online through the Arlingtonpermits.com.(https://ap.arlingtontx.gov/AP/sfjsp?interviewID=SignOn)**

2. All steps in the plan review and inspection process must be followed. Deviation from the requirements may result in delays and possible rejection of plans or inspection delays.

3. All inspections require a permit and a set of approved plans on the job site.
   - Failure to maintain the approved drawings and permit on-site may result in a failed inspection and re-inspection fees.

4. The contractor is responsible for ensuring that the system(s) being installed or serviced are in compliance with all current locally adopted codes – including, but not limited to the 2021 International Fire Code (IFC), 2021 International Building Code (IBC), most current NFPA Standards, and City of Arlington Ordinance #22-056.

5. All Fire Sprinkler permit submittals must include a copy of the TDI license for the company (SCR) and the plans designer (RME-G) or Texas Professional Engineer

6. All calculations must be signed by a TDI Licensed RME-G or TX professional engineer.

7. All submitted plans must be digitally signed and stamped by a TDI Licensed RME-G or professional engineer / fire protection engineer.

8. Any approval issued by the Fire Prevention Division does not release the contractor or property owner from the responsibility of full compliance with all applicable codes and ordinances relating to the construction project.

9. All installations must concur with the approved plans. Any deviation from the approved plans requires a re-submittal to the Fire Prevention Division.

10. The Fire Inspector will provide documented results after each inspection.

11. All water-flow test results must be within 12 months of permit application

It is the goal of the Fire Prevention Division to complete your plan review within the shortest possible time. **We strive to complete your plan review within 10 business days from receipt of the plan submittal package.** Please be advised that revisions, changes, or an incomplete submittal package may delay your final plan approval. We do not offer an expedited plan review process.

# FIRE SPRINKLER SYSTEMS (FSS) – ABOVE GROUND

These guidelines are to be followed when a business, facility, or organization proposes to install or modify an automatic fire sprinkler system within the City of Arlington. These guidelines are not to be interpreted as to contain all data required for proper design, installation, or approval.

All automatic sprinkler systems for the purposes of this guideline and any other guidelines or requirements of the City of Arlington shall conform to the 2021 IFC, as adopted and amended by the City of Arlington Ordinance #22-056 and the most current edition of all NFPA standards.

## Arlington Specific Fire Sprinkler Requirements

**An Automatic Fire Sprinkler System Shall Be Installed In:**

- ALL self-service storage facilities.
    - For the purpose of this provision, firewalls shall not define separate buildings.
- All Group I, H & R occupancies are sprinklered regardless of total square footage.
- Group A-2 occupancies where ONE of the following conditions exists:
    - The fire area exceeds 5,000 square feet
    - The fire area has an occupant load of 100 or more
    - The fire area is 2 stories or more in height (including basements)
    - The fire area contains a multi-theater complex.

**High-Piled Storage / Warehouses / Strip Malls / Spec Buildings**

- Any building exceeding 6,000 sq. ft. with an inside clear height above 12 feet, making it possible to store higher than 12 feet, shall be considered to be high-piled storage.
    - When a specific product cannot be identified, a fire protection system shall be installed for Class IV commodities, to the maximum pile height.
- Sprinkler systems for all strip retail centers, multiple tenant buildings, speculative warehouses, or any other multiple tenant building, regardless of ceiling height, shall be designed to provide a minimum of Ordinary Hazard Group 2 for Class IV commodities.
- **Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, ONLY manual smoke and heat vents or manually activated engineered mechanical smoke exhaust systems shall be required within these areas.
- Automatic Smoke/Heat vents are PROHIBITED with ESFR Fire Sprinklers.

**Pre-Action & Dry Systems**

- Dry-system air compressors shall be hard-wired and pass a 24-hour air leak test.
- Pre-action system solenoids shall be wired for alarm activation upon current loss.

**Fire Sprinkler Valves and Drains**

- All valves controlling the water supply for automatic sprinkler systems and water-flow switches on all sprinkler systems and standpipe systems, with the exception of fire department hose connections, shall be electronically supervised.
- Approved, supervised, indicating control valves shall be provided at the point of connection to the riser on each floor in multi-floor buildings.
- At least one inspection test valve shall be located at the remote system area.
- Inspector test connections, drains, and ball-drips shall be piped directly to the exterior and labeled as such.

**Water-Flow Switch - Time Delay**

- Time delay on water flow switches must be set to a delay of 45-90 seconds.

**13R Systems**

- Installer shall provide calculations required for “Domestic Use” in 13R Systems

**Prohibited Areas for Fire Sprinklers**

- Automatic Sprinklers shall not be installed in:
    - Elevator machine rooms / elevator machine spaces
    - Elevator hoistways, other than pits where such sprinklers would not necessitate shunt trip requirements under any circumstances.

**Fire Sprinkler System Documentation**

- A stamped set of “AS BUILT” plans shall be posted in approved labeled document box.
    - Installation/fabrication/construction of system requires approved plans & permit on site.
        - All Fire Dept forms & permits shall be kept on the jobsite until final inspection.

## Riser Room Requirements

- Sprinkler system risers providing protection for buildings with multiple tenant spaces must be located in a ground floor room directly accessible from the exterior.
- Riser rooms shall be permanently heated, and such heating appliances shall be hardwired to the building electrical distribution system.
- Riser Rooms shall be large enough to accommodate maintenance and testing
    - Riser Rooms shall be no smaller than 6 ft. by 6 ft,
    - Riser Rooms shall be at least 8 ft x 8 ft if DCDA & devices are installed inside.
    - Fire Pump rooms shall be even larger.
- Riser rooms shall have two approved, labeled document boxes.
    - 1 for the Fire Alarm System
    - 1 for the Fire Sprinkler System
- All fire sprinkler valves shall be properly marked in accordance with NFPA 13.
- **Hydraulic Calculation Placards shall be on metal signs with the details**
- **machine engraved or laser etched into placard.**
    - Handwritten/Hand scribed details or stickers on placards are prohibited.
- **Riser Room Door** shall be labeled with a 12-inch x 12-inch sign.
    - Sign shall have **WHITE** lettering on a RED background
    - Sign shall be ASTM D4956-13 – Grade VIII retro-reflective standard or higher.
        - (Commonly known as 3M Diamond Grade or Avery T-7500 MVP)
    - All signs shall be a minimum of 0.063 inch thick solid aluminum substrate
    - Some locations will require address on sign. (At the discretion of the Fire Official)
    - Sign shall be mechanically fastened to the door
- ***E-mail design proof for each sign to Fire Systems for approval prior to ordering.***

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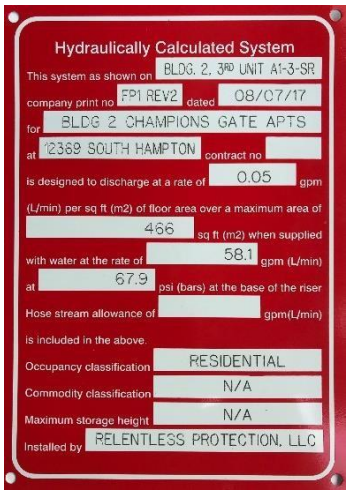
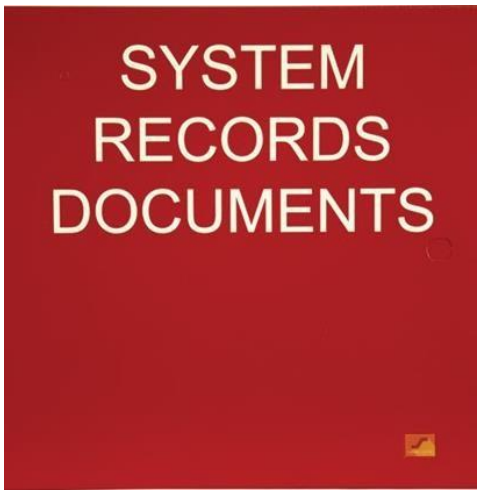
**Riser Room Sign**




**Hydraulic Calc. Plate**




**Approved Document Box**

## Fire Department Connection (FDC) Requirements

- The FDC must be within 100 ft. of a fire hydrant as a fire hose lays.
- The FDC shall be clear and unobstructed with a minimum clearance of a 3 ft radius
- The FDC shall be installed between 40 - 48 inches above grade.
- Locking Knox “plugs” are required on FDCs for new construction and missing or damaged caps on existing construction.
- FDC shall be located on any side of the building that has a fire lane.
- FDC(s) shall have approved threaded 4” Storz connections only.
- FDC prefered to be attached to the building.
- Approved, audible/visual device shall be connected to every automatic sprinkler system
    - It shall be weatherproof & mounted outside above the FDC at 7 feet above grade

## FDC Sign Requirements

- Sign shall have **WHITE** lettering on a **RED** background
- Sign shall be 12-inches x 12-inches minimum
- Printed on minimum 0.063 solid Aluminum substrate
- FDC letters shall be minimum 4 inches tall
- Building address below in 1.5-inch letters/numbers (unless otherwise approved)
- Sign shall meet ASTM D4956-13 – Grade VIII retro-reflective standard or higher.
    - *(Commonly known as 3M Diamond Grade or Avery T-7500 MVP)*
- It shall be posted 9 feet above grade
- Sign shall be mechanically fastened to the wall

*** ***E-mail design proof for each sign to fire systems for approval prior to ordering*** ***

## Class 1 Standpipe / Fire Hose Valve (FHV) Requirements

- Standpipes & FHV's shall be installed in accordance w/ 2021 IFC & 2019 Ed. NFPA 14.
- Class 1 Automatic Wet Systems shall be installed when standpipes/FHV's are required.
- Locking Knox "caps" are required on all Standpipes and Fire Hose Valves
- Manual dry standpipe systems (if approved by Fire Marshal) shall be supervised with
    - (Low alarm) Minimum 10 psig and (High Alarm) maximum of 40 psig air pressure
- In addition to the requirements of IFC, Class I standpipes shall also be required on all occupancies in which the distance from accessible points for the Fire Department ingress to any point in the structure exceeds two hundred feet (200') along the route that a fire hose laid as measured from the fire lane.
- When required by this Code, Fire Hose Valve connections shall be placed adjacent to all required exits to the structure and at two-hundred foot (200') intervals along major corridors thereafter with an individual water-flow device.
- Hose valves shall be 2.5" with a locking Knox cap & 40 - 48 inches above finished floor.
- Hydraulic calculations shall be provided on form sheets that include a summary sheet, detailed work sheets and a graph sheet.

## Submittal Requirements for Above Ground Fire Sprinkler System

The plans will be reviewed based on the requirements in the 2021 IFC, NFPA 13 (2019 Ed.) and City of Arlington Ordinance #22-056.

**Each submission shall contain a total of 2 PDF documents uploaded through the portal**

1. One set of digitally signed plans
2. One set of data/spec sheets and all other supporting documentation

**Data submittal booklet shall be one continuous PDF containing:**

- Scope of Work Summary
- Copy of Contractor's Texas Department of Insurance License (**SCR and RME-G**)
- Data specifications sheets for all equipment shall be provided
    - Specific materials on data sheets shall be identified by arrow or highlighter
    - Data Sheets for all Knox-Box, Knox-Caps, Knox Plugs
    - Data Sheets for Document Box
- Hydraulic system calculation sheets
    - Signed by RME-G or TX Licensed P.E.
    - Provide graphic representation of the water flow analysis
    - Fire protection systems shall be designed with a 10 psi safety factor
- Design Specifications for ALL Signage (FDC, Riser Room, etc)

**Plan Size and Clarity:**

- Plans shall be clear & legible.
- All sheets shall be in a common and appropriate scale (minimum 1/8" = 1'0").
- Submittals done on electrical, lighting, or other "busy" plans are not acceptable.
- Shall contain sufficient detail to enable plan reviewer to accomplish a complete review.

**The following information shall be provided on the plans:**

- Scaled copy of approved site plan to include fire hydrants, fire lanes, fire service lead-in
- North Arrow
- Scale with graphic reference
- Sprinkler riser diagram and riser/fire pump room size
- Notes shall state:
    - System meets current edition of NFPA 13, 2021 IFC, City of Arlington local amendments and the Fire Marshal's Office Procedures & Specifications
    - List the responsible party regarding freeze protection
- The title block shall contain the following:
    - Business name and address of the installation
    - Name, complete address, phone number and e-mail of the installing company
    - Licensing information
    - Digital signature of the RME or TX Licensed P.E.
    - Drawn by & Date
    - AHJ as City of Arlington
- A legend shall be provided to include:
    - Symbol, sprinkler description, manufacturer, model # & quantity for each device
    - Pipe and fittings type
- Location and details of the Fire Department Connection (FDC)
- Hydrant Flow test data, as witnessed by the Arlington Fire Inspector (Date & Data)
- Description of the design area (Hazard Classification)

- Hydraulic calculations for each design area including area of coverage per head, design density, and specific commodity protected (Clearly indicate each remote area)
- Floor plan of building(s) with all walls and doors shown w/Use of each room identified
- Square footage of building (or area within scope of work)
- Occupancy classification and Occupant Load
- Complete full-height cross section of the building & total area protected by each system
- Capacity of the dry system *(if applicable)*
- Elevations of sprinkler lines and node points
- Hanger details and locations
- Inspectors test connection and Auxiliary drain details
- Size, location and details of hose valves and/or standpipes (if applicable)
- 24" x 36" floor plan, with color coded Zones for all systems with two (2) or more risers shall be laminated or framed w/non-breakable plastic cover in riser room

## Installing DCDA In Riser Room

- If applying to have double-check detector assembly installed in riser room instead of
- underground vault, then installation shall meet City of Arlington's General Design
- Standards and show all details on plans.
    - DCDA must have a backflow preventer and ¾ inch bypass meter
    - An approved port must be provided in Riser Room wall to read bypass meter
    - Bypass meter port shall be labeled "FIRE RISER METER"
- DCDA can only be approved if all criteria are met and approved by Arlington FMO.

## Aboveground Hydrostatic & Visual Inspection

- Knox-Box, Knox FDC caps, document box & hydraulic calculation plate shall be installed prior to requesting hydro/visual inspection
    - Knox-Box 3200 for Single Tenant // 4400 Series w/Single Key for Multi-Tenant
- Sprinkler piping & hangers shall not be covered/concealed by any means prior to being inspected and approved by a Arlington Fire Inspector.
    - If ceiling is blocking view, the inspection automatically results in a failure.
    - The resulting re-inspection will incur a fee as outlined in Ordinance #22-056
- Test will be at 200 psi, or 50 psi above normal pressure if greater than 150 psi
- Test shall be a minimum of two hours with no pressure drop or gain allowed
- Hydro. test is required for all new installations & alterations with > 20 heads Riser Main Flush: Upon completion of the hydrostatic test, system will be drained and returned to normal working pressure in the presence of a Arlington Fire Inspector.
- 24" x 36" floor plan, with color coded Zones for all systems with two (2) or more risers shall be laminated or framed w/non-breakable plastic cover in riser room

## Aboveground Fire Sprinkler Final

- Inspection shall be conducted when all sheet rock and mill work is completed.
- This inspection is to verify that coverage is adequate with no shadow areas.
- Sprinkler heads must be clean and free from paint, construction debris, or other conditions that would affect the proper operation.
- A printed set of "AS BUILT" plans shall be posted in the Riser Room in an approved
- labeled document box.
- No sprinkler heads <12" from Diffusers. All heads >12" but <30" must be intermediate.

# FIRE SPRINKLER - TENANT FINISH-OUT/BUILDING ALTERATION

These guidelines are to be followed when a business, facility or organization proposes to modify an existing automatic fire sprinkler system within the City of Arlington.

These guidelines are not to be interpreted as containing all data required for proper design, installation, or approval. All automatic sprinkler systems for the purposes of this guideline and any other guidelines or requirements of the Fire Marshal's Office shall conform to the 2021 IFC as adopted and amended by City of Arlington Ordinance #22-056 and NFPA 13 (2019 Ed.)

## Installation & Testing Requirements

- Please see the Guidelines for Automatic Fire Sprinkler Systems. To expedite the plan review and inspection processes, please refer to the information listed below.

## Submittal Requirements for Tenant Finish-Out/Building Alteration

**Each submission shall contain a total of 2 PDF documents uploaded through the portal**

1. **One set of digitally signed plans**
2. **One set of data/spec sheets and all other supporting documentation**

**Each submittal packet shall be one continuous PDF containing:**

- Cover Sheet with Scope of Work Summary
- Copy of Company's **SCR** License
- Copy of **RME-G** or **State of Texas P.E. License**
- Data specifications sheets for all equipment shall be provided
  - Specific materials on data sheets shall be identified by arrow or highlighter
- Photos of the following items from the existing system:
  - Hydraulic Calculation Plate (or invoice for new one on order)
  - Riser Room Sign (or Design Proof for approval if missing)
  - FDC Sign (or Design Proof for approval if missing)
  - Fire Department Connection
  - Document Box(s) in Riser Room
  - Current Fire Sprinkler System inspection tag (front and back)
- Water flow test (Flow test must be within 12 months of permit application)
- Hydraulic calculations will be required for all permits adding 10 heads or more and/ or where the modifications proposed create a higher hazard classification

❖ If the tenant finish-out/remodel requires <10 heads to be added/relocated, a SOW letter signed by a RME may be submitted in lieu of plans. (At Fire Plan Review discretion)

- Letter shall state: How many heads to be added/altered, their location, reason for the work, proof/statement that current fire sprinkler system will support the additional heads.
- ***SOW shall also document hydraulic details from sprinkler placard.***

**Plan Size and Clarity:**

- Plans shall be clear & legible.
- All sheets shall be in a common and appropriate scale (minimum 1/8" = 1'0").
- Submittals done on electrical, lighting, or other "busy" plans are not acceptable.
- Plans shall contain sufficient detail to enable reviewer to accomplish a complete review.

**The following information shall be provided on the plans:**

- Site Plan to indicate where in the building the modification is to be performed.
  - Cloud area or otherwise indicate
- Floor plan with use of each room clearly identified (All walls and doors shall be shown)
- Scale with graphic reference
- Square footage
- A minimum of one (1) set of hydraulic calculations shall be provided on the plans
- A photo of the existing Hydraulic Calculation Plate shall be included on the plans
- Hydrant Flow test data, as witnessed by the Arlington Fire Inspector (Date & Data)
  - Required if adding 20 or more heads to the existing system
- Provide notes to indicate the following design standards
  - IFC Occupancy Classification per the City of Arlington (B, S-1, A-3, M, etc)
  - NFPA 13 hazard classification (Light, Ordinary, Extra)
  - Scope of Work.
- Type of sprinkler heads and area of coverage per sprinkler head
- Elevation of sprinkler lines and node points
- Hanger details & locations
- The title block shall contain the following:
  - Location of the installation
  - Name and complete address of the business
  - Name and complete address of the installing company
  - Licensing information
  - Date
  - Drawn by
  - Digital Signature of RME
  - Authority Having Jurisdiction
  - Scale
- An equipment legend shall be provided to include:
  - Symbol, sprinkler description, manufacturer, model number, and quantity for each device
  - Pipe and fittings type
  - Indicate which sprinkler heads are new, existing and relocated
- Indicate what piping is new and existing
- See NFPA 13 for additional plan submittal requirements.
- Installation or fabrication of the system is prohibited without approved plans and permit.
- All installations and/or operations must concur with the approved plans.
  - **Any deviation from the approved plans will require a re-submittal to the FMO.**
- All stamped plans and permits shall be kept on job site until final inspection is complete.
- Plans approved by the City of Arlington, Fire Prevention Division, give authorization for construction and/or operation. Final approvals are subject to field verification.
- Any approval issued by the Fire Prevention Division does not release the contractor or property owner from the responsibility of full compliance with all applicable codes and ordinances relating to the construction project.
- An approved set of “AS BUILT” plans shall be posted at FACP, each Fire Riser and Fire Pump regarding both the Fire Sprinkler and the Fire Alarm systems, if altered.
- These shall be placed in an approved labeled document box.
- If the current Fire Sprinkler System does not have approved metal hydraulic placards with the details engraved or etched into it, then they shall be installed prior to calling for any inspection.

# FSS ABOVE GROUND INSPECTION REQUESTS & PROCEDURES

## Required Procedures When Requesting an Inspection

- All inspection requests shall be coordinated by emailing Firesystems@arlingtontx.gov.
- Contact your inspector at least 48 hours in advance of the requested inspection.
- A representative of the requesting company must be present at time of inspection who can effectively communicate and answer any questions from the Fire Inspector.
- City of Arlington Fire Marshal's Office approved, stamped, and signed plans and
- permits must be kept on the job site and presented to the inspector upon request.

## New Fire Sprinkler System - Hydro/Visual inspection requests:

- **Subject Line of e-mail shall contain:**
  - Type of inspection -Address of installation -Permit #
  - (i.e., Hydro/Visual Inspection Request – 1234 Any Street – Permit #202101120)
- **Body of e-mail shall contain:**
  - Name, complete address, phone number and e-mail of installing company
  - Name, cell number and e-mail of lead technician at the acceptance test
  - Photo of Hydraulic Calc Plate Installed
  - Photo of Riser Room & FDC Signs (shall be present on-site)
  - Photo of Knox FDC Plugs installed
  - Photo of Knox Caps installed on FHV and/or Standpipes (if applicable)
  - Photo of the properly mounted Knox Box (5 feet above finished grade)
  - Photo of approved and installed Document Box
  - Photo of approved FSS Zone Map (All Systems with 2 or more Risers)

## New Fire Sprinkler System - Final inspection requests must include:

- **Subject Line of e-mail shall contain:**
  - Type of inspection -Address of installation -Permit #
  - (i.e., Fire Sprinkler Final Request – 1234 Any Street – Permit #202101120)
- **Body of e-mail shall contain:**
  - Name, complete address, phone number and e-mail of installing company
  - Name, cell number and e-mail of lead technician at the acceptance test
  - Photo of Riser Room Sign Installed
  - Photo of properly installed FDC Sign

## Existing Fire Sprinkler System – ALL inspection requests must include:

**Subject Line of e-mail shall contain:**

- Type of inspection - Address of installation - Permit #
- (i.e., Hydro/Visual Inspection Request – 1234 Any Street – Permit #202101120)

**Body of e-mail shall contain:**

- Name, complete address, phone number and e-mail of installing company
- Name, cell number and e-mail of lead technician at the acceptance test
- Photo of Fire Sprinkler System and Fire Alarm System inspection tags
- Photo of Hydraulic Calc Plate
- Photo of approved and installed Document Box
- Photo of Riser Room and FDC Signs