CARROLLTON
FIRE RESCUE

FIRE MARSHAL'S OFFICE



CONSTRUCTION GUIDE FIRE SPRINKLER SYSTEMS 2022 Edition

Updated February 2022



CARROLLTON FIRE RESCUE

Fire Marshal's Office

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CARROLLTON 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 Carrollton, 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 CityServe Portal.
- 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 Carrollton Ordinance #4044.
- 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 15 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.

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 Carrollton. 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 Carrollton shall conform to the 2021 IFC, as adopted and amended by the City of Carrollton Ordinance #4044 and the most current edition of all NFPA standards.

Carrollton Specific Fire Sprinkler Requirements

An Automatic Fire Sprinkler System Shall Be Installed In:

	ALL self-service storage facilities.
	ALL buildings over 6,000 square feet.
	 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.
Hi	gh-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 <i>smoke and heat vents</i> or manually activated engineered mechanical smoke exhaust systems shall be required within these areas.
	Automatic Smoke/Heat vents are PROHIBITED with ESFR Fire Sprinklers.
Pr	e-Action & Dry Systems
	Dry-system air compressors shall be hard-wired and pass a 24-hour air leak test.
_	Pre-action eyetem colonoide shall be wired for alarm activation upon current loss

Fii	re 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.
W	ater-Flow Switch - Time Delay
	Time delay on water flow switches must be set to a delay of 60-90 seconds.
13	R Systems
•	Installer shall provide calculations required for "Domestic Use" in 13R Systems
Pr	ohibited 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.
Fii	re Sprinkler System Documentation
•	A stamped set of "AS BUILT" plans shall be posted in approved labeled document box
	Installation/febrication/construction of avatam requires approved plane 2 parmit on site

- ☐ Installation/fabrication/construction of system requires approved plans & permit on site.
 - $\circ\quad$ 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 hard-wired to the building electrical distribution system.
- □ Riser Rooms shall be large enough to accommodate maintenance and testing
 - o Riser Rooms shall be no smaller than 6 ft. by 6 ft,
 - o 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
 - o 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
 - o 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 inspector for approval prior to ordering.



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 hos	e lays
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- ☐ 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 the addressed street side of the building and fully visible from the Fire Department access.
- FDC(s) shall have approved threaded 2 ½" connections only.
 - o "Storz" connections are prohibited.
- FDC must be attached to the building (Remote/yard FDC's are prohibited)
- ☐ 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 lett	ering on a F	RED background
- 3		- 3	

- ☐ 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 inspector for approval prior to ordering ***



Class 1 Standpipe / Fire Hose Valve (FHV) Requirements

• Standpipes & FHV's shall be installed in accordance w/ 2021 IFC & 2022 Ed. NFPA 14.

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- 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
 - o (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 (2022 Ed.) and City of Carrollton Ordinance #4044.

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

Da	ata submittal booklet shall be <u>one continuous PDF</u> containing:
	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)
Pla	an 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.
	Chair contain camerain actain to chable plan forther to accomplish a complete review
Th	ne 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 Carrollton local
	amendments and the Fire Marshal's Office Procedures & Specifications Guide
_	List the responsible party regarding freeze protection
Ц	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 District and the BME of TYLLine and IRE
	 Digital signature of the RME or TX Licensed P.E.
	Drawn by & Date All Lag City of Correllton
_	AHJ as City of Carrollton
Ц	A legend shall be provided to include:
	 Symbol, sprinkler description, manufacturer, model # & quantity for each device
\Box	 Pipe and fittings type Location and details of the Fire Department Connection (FDC)
	Location and details of the Fire Department Connection (FDC) Hydrant Flow test data, as witnessed by the Carrollton Fire Inspector (Date & Data)
	Description of the design area (Hazard Classification)

	Capacity of the dry system (if applicable) Elevations of sprinkler lines and node points Hanger details and locations
<u>Insta</u>	Illing 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 Carrollton's General Design Standards and show all details on plans. O DCDA must have a backflow preventer and ¾ inch bypass meter O An approved port must be provided in Riser Room wall to read bypass meter O Bypass meter port shall be labeled "FIRE RISER METER"
	DCDA can only be approved if all criteria are met and approved by Carrollton FMO.
Abov	veground Hydrostatic & Visual Inspection
	Knox-Box, Knox FDC caps, document box & hydraulic calculation plate shall be installed prior to requesting hydro/visual inspection o 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 Carrollton Fire Inspector. o If ceiling is blocking view, the inspection automatically results in a failure. The resulting re-inspection will incur a fee as outlined in Ordinance # 3702.
	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 Carrollton Fire Code Official 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
Abov	veground 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
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

• No sprinkler heads <12" from Diffusers. All heads >12" but <30" must be intermediate.

labeled document box.

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 Carrollton.

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 Carrollton Ordinance #4044 and NFPA 13 (2022 Ed.)

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

	ch 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
п	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) Riser Room Sign (or Design Proof for approval if missing)
	FDC Sign (or Design Proof for approval if missing) Fine Paragraph Comparation
	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 Inspector's discretion)
	o 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.
Pla	an 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.

ın	e following information shall be provided on the plans:
	Site Plan to indicate where in the building the modification is to be performed. O 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 Carrollton Fire Inspector (Date & Data)
ш	Required if adding 20 or more heads to the existing system
П	Provide notes to indicate the following design standards
	 IFC Occupancy Classification per the City of Carrollton (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
	o Date
	Digital Signature of PME
	Digital Signature of RMEAuthority 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 Carrollton, 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 placerds.
	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
	with the details engraved or etched into it, then they shall be installed prior to calling for any inspection.
	any moposition.

FSS ABOVE GROUND INSPECTION REQUESTS & PROCEDURES

Required Procedures When Requesting an Inspection

- ☐ All inspection requests shall be coordinated by contacting the inspector on your permit.
 - □ 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 Carrollton 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 #
- o (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
- o Name, cell number and e-mail of lead technician at the acceptance test
- Photo of Hydraulic Calc Plate Installed
- o 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)
- o 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 #
- o (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
- o 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

<u>Existing Fire Sprinkler System – ALL inspection requests must include:</u>

Subject Line of e-mail shall contain:

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

Body of e-mail shall contain:

- o Name, complete address, phone number and e-mail of installing company
- o 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