



Fire Alarm Plan Submittal Guidelines

These guidelines are provided as an aid to successful prompt plan review and to insure the minimum information required to inform the extent and intent of the work proposed in the town of Prosper based on the documentation requirements of the adopted national standard NFPA 72. This document includes examples of information presented as figures, tables and best practice recommendations. These examples are not intended to establish the only forms by which this information may be presented.

The following are the codes & standards in force in the Town of Prosper Ordinance/Amendments

- International Fire Code 2015
- International Building Code 2015
- International Mechanical Code 2015
- Most current published edition of NFPA 72
- Manufactures Installation Instructions
- National Electrical Code 2017

Fall 2018

For additional information see our web page at www.prospertx.gov/fire-department/fire-marshal/

Prosper Fire Department ● 1500 E. First Street Prosper, Texas 75078
972-347-2424 ● Phone 972-347-3010 Fax ● www.prospertx.gov

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3rd Party Plan Review Policies

Bureau Veritas shall remain as the exclusive 3rd Party Plan Review firm for all “New and Remodel Commercial Construction Fire Service” related projects. (All related expenses are the responsibility of the contractor, owner, or designated agent).

Please contact Bureau Veritas at 817-335-8111 for document handling requirements.

System types shall include:

- Underground fire service
- Aboveground sprinkler suppression systems
- Fire Alarm systems
- Kitchen hood suppression systems
- Alternative suppression systems
- Controlled access systems (building and/or gates)

The permit shall be issued through the Prosper Fire Marshal’s Office at no charge when the stamped approved drawings, equipment data package and the approval review letter are received. Bureau Veritas will email our office with the approved submittal package. It is the contractor’s responsibility to assure through Bureau Veritas, we receive all of the documentation in the following manner:

- Stamped approved drawings in PDF format (as a separate attachment)
- Equipment data package in PDF format (as a separate attachment)
- Approval review letter in PDF format (as a separate attachment)

System types shall include:

- Underground fire service
- Aboveground sprinkler suppression systems
- Fire Alarm systems
- Alternative suppression systems
- Kitchen hood suppression systems
- Controlled egress doors and controlled access gate systems

Contact the Fire Marshal’s Office at 972-346-9469 regarding these requirements.

- The Fire Marshal’s Office must receive stamped and approved plans, data submittal package and the approval review letter in PDF format as three (3) separate attachments before permit issuance.

The policies & procedures established under the Prosper Fire Department Ordinance/Amendments for documentation collection shall remain unchanged.

Please consult the Fire Marshal’s web page @ www.prospertx.gov/fire-department/fire-marshal for further information & instructions.

This directive shall remain in effect until further notice.

Our goal is to provide a *complete and accurate review in the shortest possible time*. Our 3rd Party Plan Review Firm will strive to accommodate plan review requests within 10 working days for the first submittals, and 5 working days for interior finishes (less than 5 initiating and less than 10 notification appliances), including re-submittals.

Plan Submittal & Permitting Process

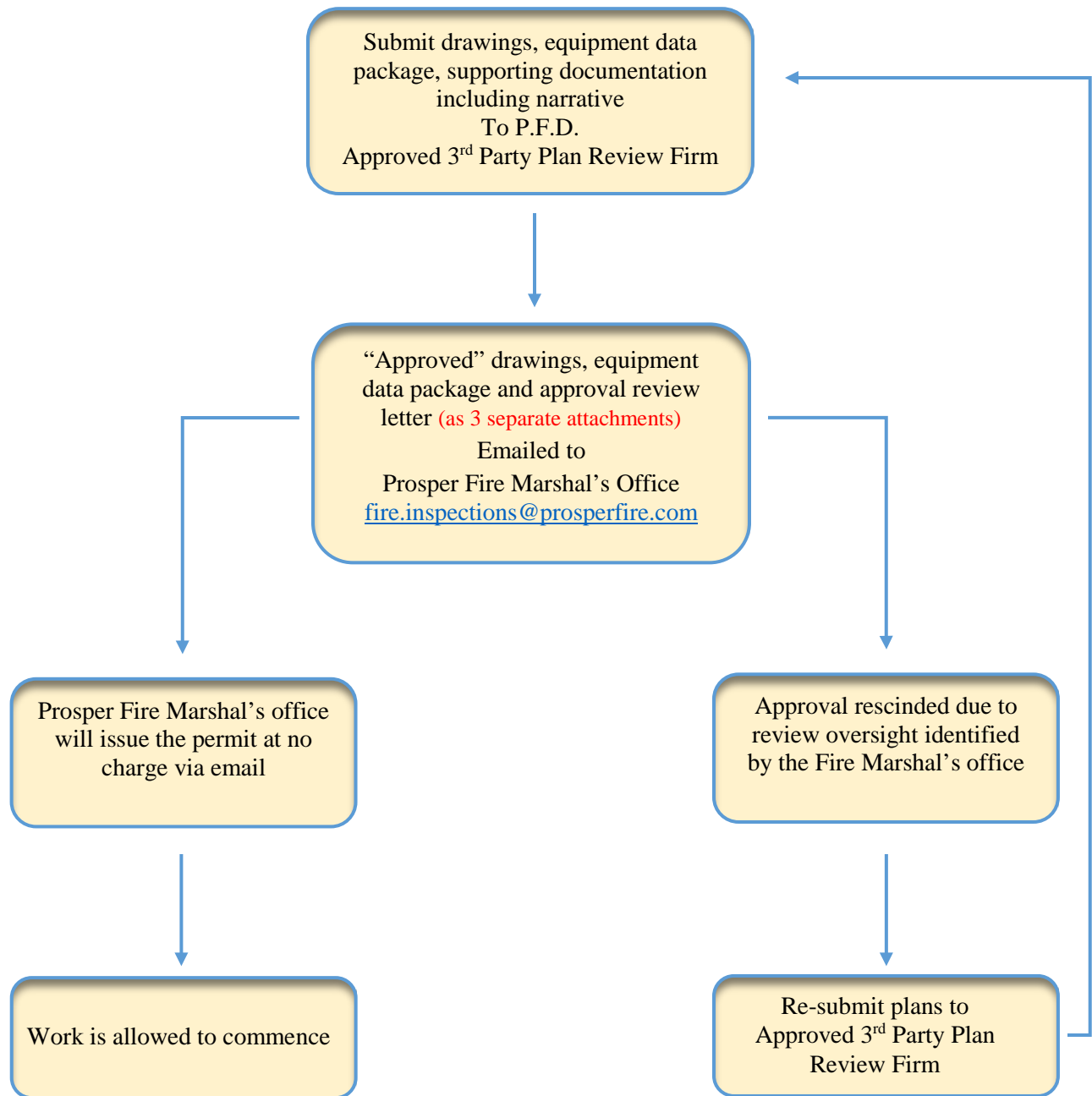


Figure 1

Submittal Check List

Does the submittal contain?

- Electronic scaled drawings in PDF Format
- Equipment submittal data package in PDF Format
- Full company information including, street address, city, state & zip, contact name, office number, cell number email address, State Registration number (ACR), APS electronic signature in contrasting color

Do the drawings contain?

- The prescribed Project Information located in the lower left corner with permit number
- The prescribed Design Information located in the center bottom
- System Designer stamp with electronic signature in contrasting color located in the lower right corner
- Site map inset showing adjacent street(s) lower right of the scale drawing
- North arrow and level/floor identification located under the scale drawing
- Device legend & project bill of materials located to the lower left of the scale drawing
- General notes to the far left of the scale drawing
- Riser diagram located to the upper left of the scale drawing
- Circuit legend located to the upper far left of the scale drawing
- All walls and doors
- All partitions extending to within 15 percent of the ceiling height (where applicable and when known)
- Room and area descriptions
- System devices/component locations
- Locations of fire alarm primary power disconnecting means
- Locations of monitor/control interfaces to other systems
- System riser locations
- Type and number of system components/devices on each circuit, on each floor or level
- Type and quantity of conductors and conduit (if used) for each circuit
- Identification of any ceiling over 10 ft. (3.0 m) in height where automatic fire detection is being proposed
- Details of ceiling geometries, including beams and solid joists, where automatic fire detection is being proposed
- Where known, acoustic properties of spaces
- Device wiring diagrams

Does the Submittal Data Package contain prescribed?

- Manufacturer's product information sheets marked with indicating arrows
- Battery manufacture data sheet/specifications marked with indicating arrows
- Wire manufacture data sheet/specifications marked with indicating arrows
- Primary power surge suppressor devices marked with indicating arrows

Do the Drawing Notes contain?

- Jurisdictional authority
- Designed-in-accordance-with codes, codes and local amendments
- Prescribed initiating circuit wiring description
- Describe all relevant operation and control functions
- Describe duct detector operation statement

This check list is provided as a submittal aid only and is not intended to cover every code requirement.

Figure 2

Shop Drawing (Installation Documentation) Elements

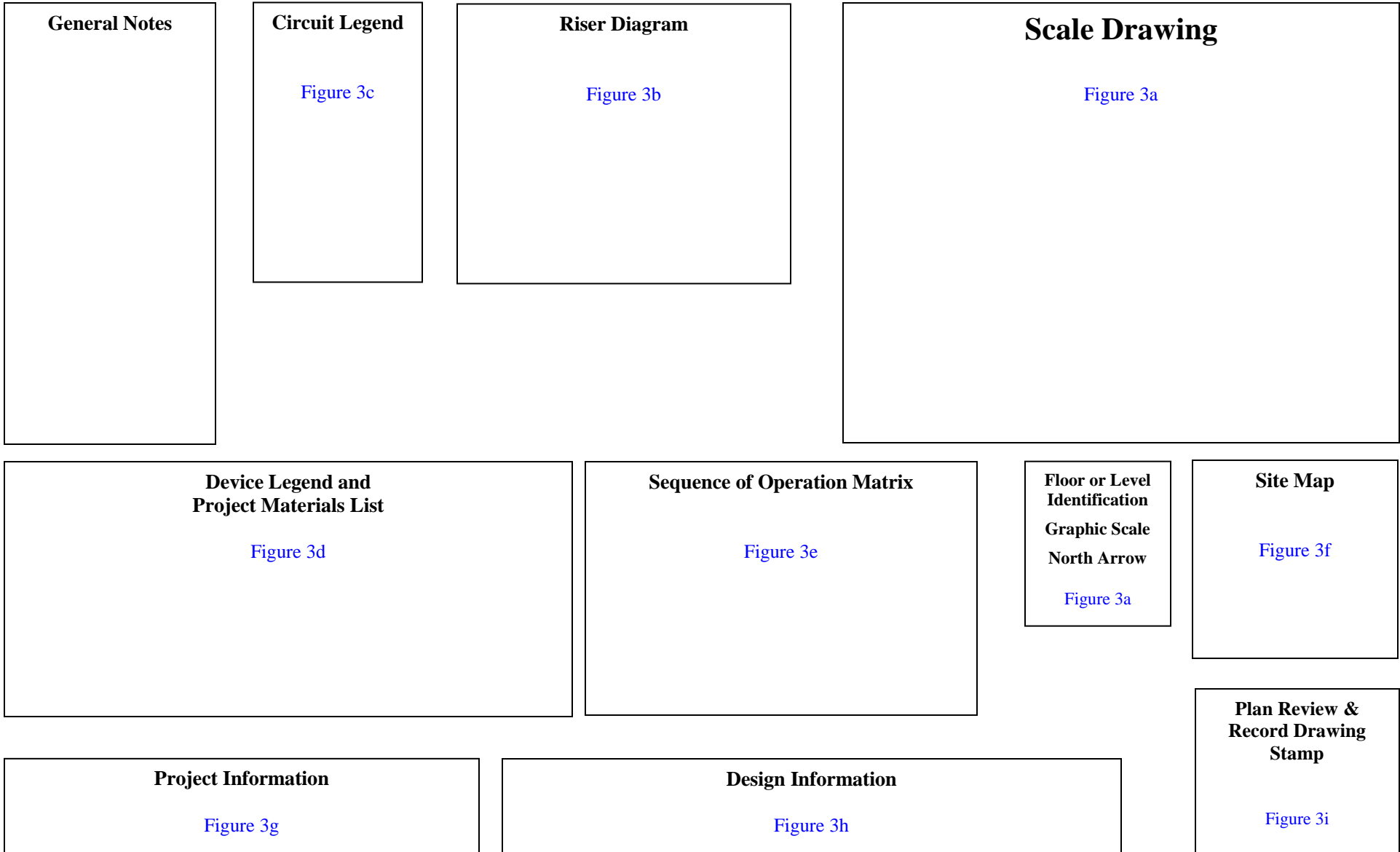


Figure 3

Scale Drawing

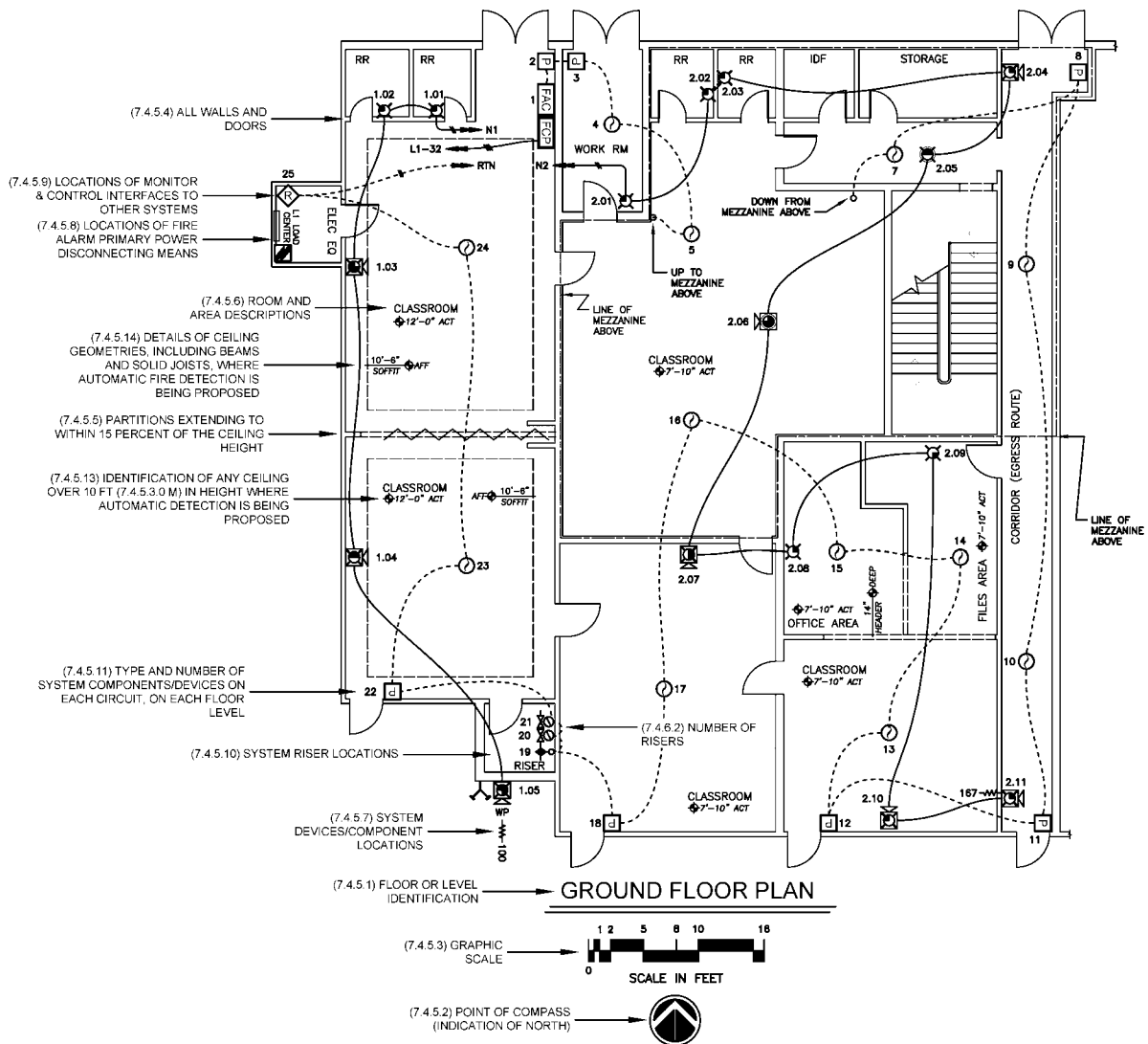


Figure 3a

Riser Diagram

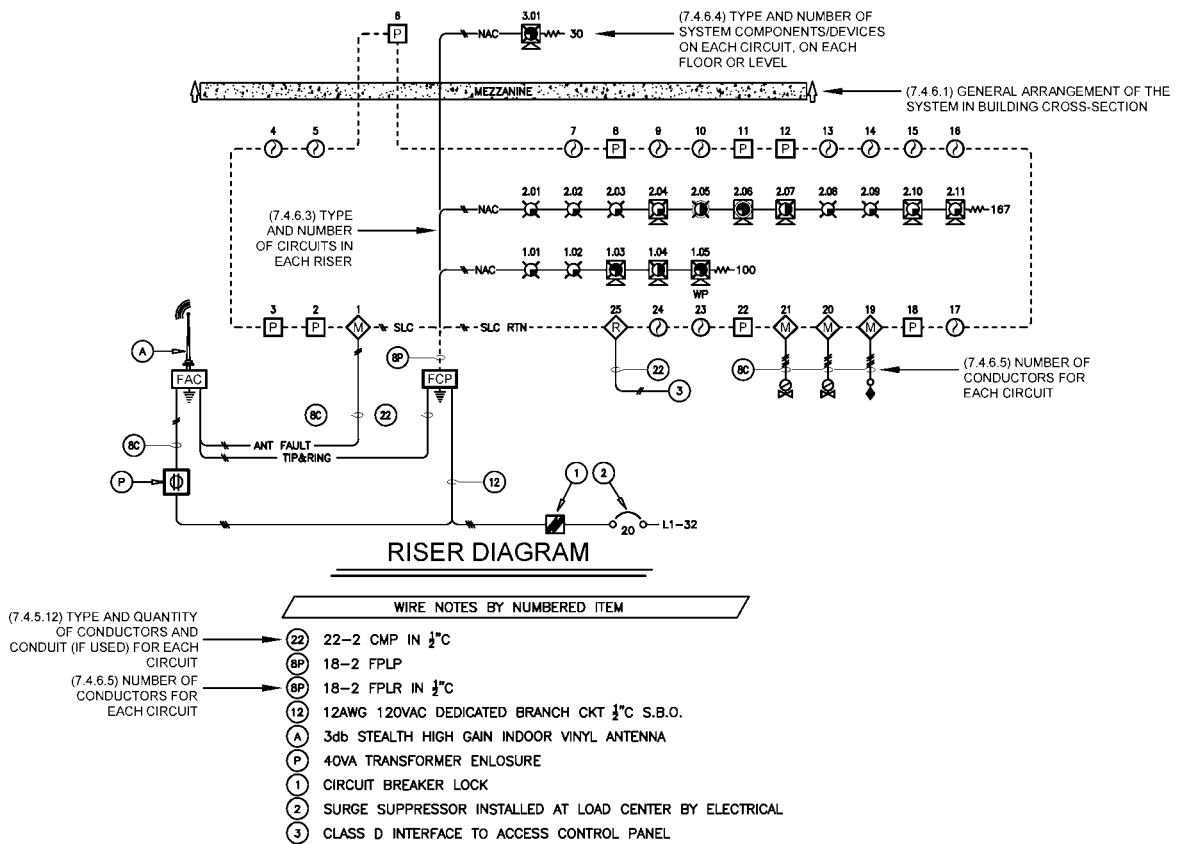


Figure 3b

Circuit Legend

- 7.4.6 System riser diagrams shall be coordinated with the floor plans and shall include the following information:
- (7.4.6.3) Type and number of circuits in each riser
- (7.4.6.4) Type and number of system components/devices on each circuit, on each floor or level
- (7.4.6.5) Number of conductors for each circuit

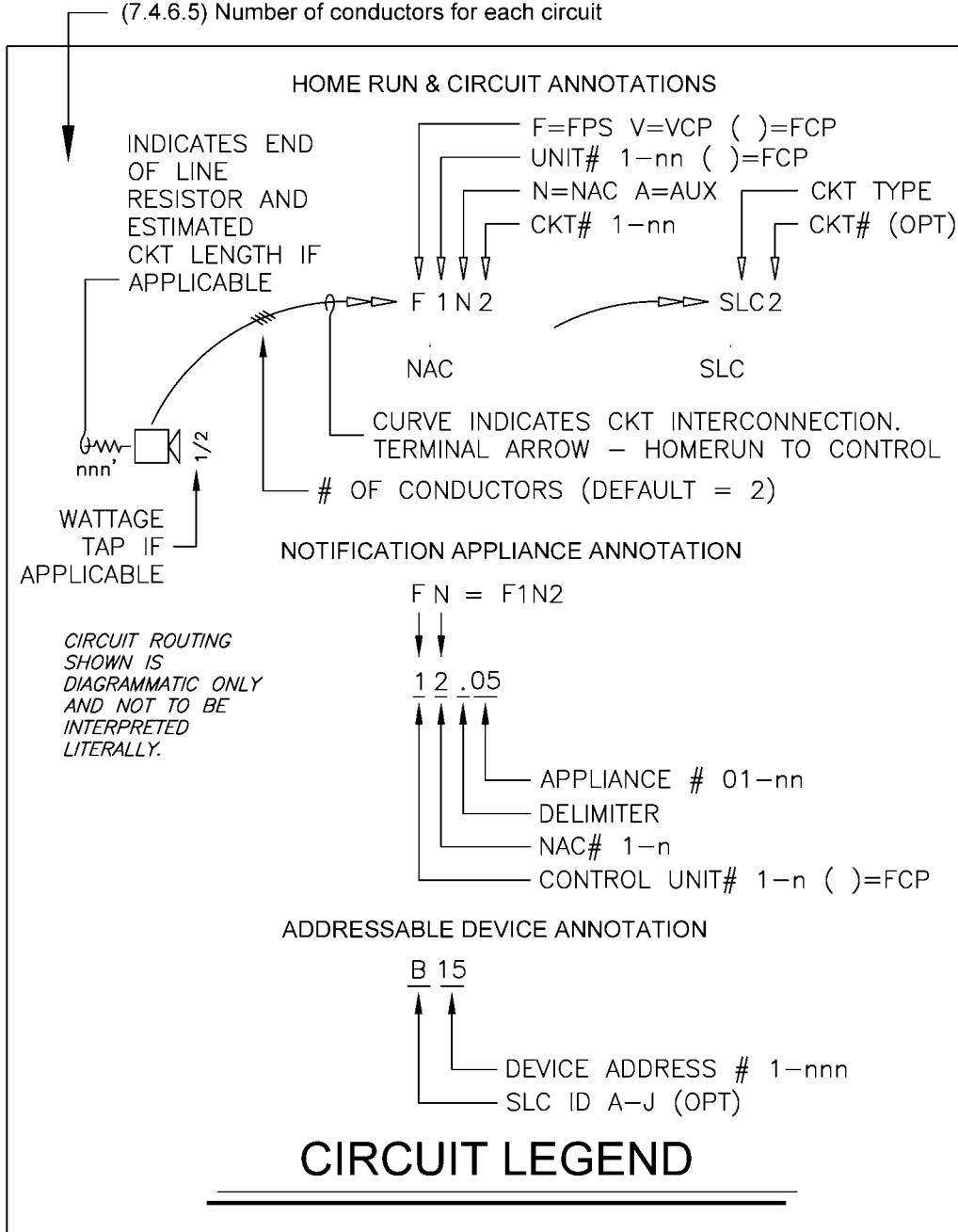


Figure 3c

Device Legend & Project Bill of Materials

(7.4.4.4) Device Legend & Symbols in Accordance with NFPA 170,
or other Symbols Acceptable to the Authority Having Jurisdiction

	QTY	PART NO	MANUFACTURE
	1	MFG PART no	MFG NAME
	7	MFG PART no	MFG NAME
	12	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	4	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	2	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	3	MFG PART no	MFG NAME
	2	MFG PART no	MFG NAME
	2	MFG PART no	MFG NAME
	7	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME
	1	MFG PART no	MFG NAME

DESCRIPTION	MOUNTING NOTES
FIRE ALARM CONTROL ADDRESS/ANALOG CLASS A/B + DACT	70" AFF TOP MAX 24.7 x 14.5 x 3.5" HWD
MANUAL PULL STATION DUAL ACTION ADDRESSABLE	48" AFF TOP MAX WITHIN 60" OF DOOR
ANALOG INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR	4SQ 4OCT 1G BOX & BASE + CLG SUPPORT BKT
INTELLIGENT RELAY DUAL FORM C SPDT	REQUIRES 4SQ BOX WITH ACCESS RATED 2AMPS @ 30VDC
ALARM INPUT MONITOR CONTACT MODULE ADDRESSABLE	REQUIRES 4SQ BOX WITH ACCESS
WATERFLOW DETECTOR + ADDRESS MODULE	DUAL CONTACT FORMC ON RISER
OS&Y SPRINK VALVE TAMPER SWITCH + ADDRESS MODULE	DUAL CONTACT FORMC ON RISER
DIGITAL (GSM) FIRE ALARM COMMUNICATOR (FAC) SINGLE PATH	REQ 16.5VAC 40VA CLASS 2 XMFR MTD ADJ CAB 10' CONDUIT
DIPOLE ANTENNA BKT MOUNT & 12' CABLE ASSY	INDOOR VERTICAL MOUNT ONLY MIN 8' AFF
50VA 18V TRANSFORMER ENLOSURE	MOUNTS 18V 50VA CLASS 2 TRANSFORMER
LINE VOLTAGE 20A PARALLEL MOUNT SURGE SUPPRESSOR	.75"C THREADED NIPPLE TO LOAD DISTRIBUTION CENTER
CIRCUIT BREAKER LEVER LOCK ASSEMBLY RED INCL SIGNAGE	PER MFG
AUDIBLE VISIBLE SIGNAL SET @ 15Cd SYNCHRONIZED 24VDC	80" - 90" AFF TO BOTTOM WALL MOUNTED 4SQ 1G 2G BOX
AUDIBLE VISIBLE SIGNAL SET @ 30Cd SYNCHRONIZED 24VDC	80" - 90" AFF TO BOTTOM WALL MOUNTED 4SQ 1G 2G BOX
AUDIBLE VISIBLE SIGNAL SET @ 75Cd SYNCHRONIZED 24VDC	80" - 90" AFF TO BOTTOM WALL MOUNTED 4SQ 1G 2G BOX
VISIBLE SIGNAL SET @ 15Cd SYNCHRONIZED 24VDC	80" - 90" AFF TO BOTTOM WALL MOUNTED 4SQ 1G 2G BOX
AUDIBLE VISIBLE SIGNAL SET @ 75Cd SYNCHRONIZED 24VDC	CLG MTD < 20' AFF UNLESS OTHERWISE NOTED 4SQ 1G 2G BOX
VISIBLE SIGNAL SET @ 30Cd SYNCHRONIZED 24VDC	CLG MTD < 20' AFF UNLESS OTHERWISE NOTED 4SQ 1G 2G BOX
AUDIBLE VISIBLE SIGNAL SET @ 75Cd SYNCH 24VDC OUTDOOR	90" AFF TO BOTTOM WALL MOUNTED INTEGRAL OUTDOOR BACKBOX

Figure 3d

Sequence of Operation Matrix

OPERATIONAL NOTES BY NUMBERED ITEM

1. SINGLE TRANSMISSION PATH IS SUPERVISED AT 60 MINUTES INTERVALS. FAILURE OF THE COMMUNICATIONS PATH IS ANNUNCIATED AT THE SUPERVISING STATION WITHIN 60 MINUTES IN ACCORDANCE WITH NFPA 72-2013 26.6.3.1.5 SINGLE COMMUNICATION PATH
2. FAILURE TO COMPLETE SIGNAL TRANSMISSION IS INDICATED AT THE PROTECTED PREMISES IN ACCORDANCE WITH NFPA 72-2013 10.15 TROUBLE SIGNALS

INPUT OUTPUT MATRIX													
												NOTES	
<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 40%;"> <p style="text-align: center; margin: 0;">LEGEND</p> <p>ACTIVATE OUTPUT Δ</p> <p>DEACTIVATE IF ACTIVE ∇</p> <p>FLASHING TO STEADY \circ</p> <p>ACTIVATE FLASHING \boxtimes</p> <p>TIMED ACTIVATE \square</p> <p>EXTERNAL CONTROL \triangleright</p> </div> <div style="width: 55%;"> <p style="text-align: center; margin: 0;">NOTES</p> <p style="text-align: center; margin: 0;">POWER ON LIGHT</p> <p style="text-align: center; margin: 0;">COMMON ALARM LIGHT</p> <p style="text-align: center; margin: 0;">COMMON ALARM SOUNDER</p> <p style="text-align: center; margin: 0;">COMMON ALARM RELAY</p> <p style="text-align: center; margin: 0;">COMMON FAULT LIGHT</p> <p style="text-align: center; margin: 0;">COMMON FAULT SOUNDER</p> <p style="text-align: center; margin: 0;">COMMON FAULT RELAY</p> <p style="text-align: center; margin: 0;">COMMON SUPERVISORY LIGHT</p> <p style="text-align: center; margin: 0;">COMMON SUPERVISORY SOUNDER</p> <p style="text-align: center; margin: 0;">COMMON SUPERVISORY RELAY</p> <p style="text-align: center; margin: 0;">SYSTEM ANNUNCIATOR</p> <p style="text-align: center; margin: 0;">CONTACT ID TRANSMISSION SEQUENCE VIA GSM</p> <p style="text-align: center; margin: 0;">ACTUATE AUDIBLE APPLIANCE</p> <p style="text-align: center; margin: 0;">ACTUATE VISIBLE APPLIANCE</p> </div> </div>													
NOTES													
SMOKE DETECTION		Δ	\boxtimes	Δ	Δ								1
PULL STATION		Δ	\boxtimes	Δ	Δ								1
ANY SPRINKLER WATERFLOW SWITCH		Δ	\boxtimes	Δ	Δ								1
ANY SPRINKLER TAMPER SWITCH		Δ						\boxtimes	Δ	Δ			
OPEN-SHORT-GROUND FAULT		Δ				\boxtimes	Δ	Δ					
LOW BATTERY		Δ				\boxtimes	Δ	Δ					
AC POWER FAILURE						\boxtimes	Δ	Δ					\square
CIRCUIT-DEVICE DISABLE		Δ				\boxtimes	Δ	Δ					
DIALER CAPTURE FAILURE	1	Δ				\boxtimes	Δ	Δ					
FAC LOW BATTERY FAULT		Δ				\boxtimes	Δ	Δ					
FAC RADIO COMMON FAILURE	2	Δ				\boxtimes	Δ	Δ					
FAC NO SERVICE FAULT	2	Δ				\boxtimes	Δ	Δ					
ACKNOWLEDGE		Δ	\circ	∇		\circ	∇	\circ	∇				
RESET		Δ	∇	∇	∇	∇	∇	∇	∇	∇	∇	∇	∇
DRILL		Δ											Δ
SILENCE		Δ		∇									∇

SEQUENCE OF EVENTS

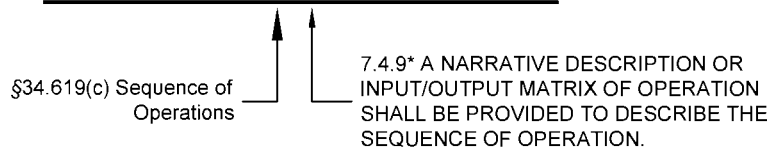
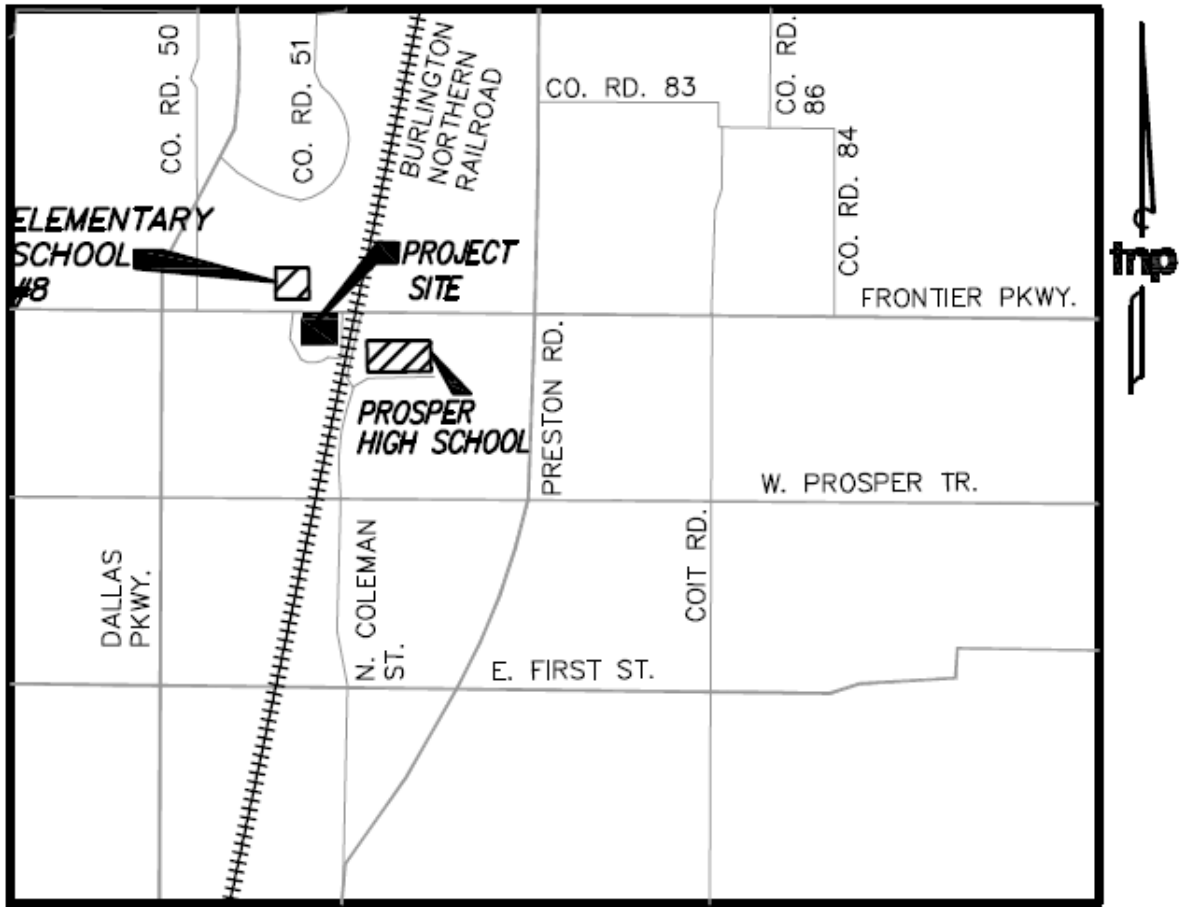


Figure 3e

Site Map



LOCATION MAP

NTS

Figure 3f

Project Information

(7.4.4.1) Name of the Protected Premises,
Owner & Occupant (7.4.4. Where Applicable)

(7.4.4.3) Location of the
Protected Premises

PROJECT INFORMATION			
NAME	Sweet Peaches Learning Center		
PROJECT ADDRESS	1234 Main Street - Suite No Prosper, Texas 75078		
PERMIT #	XXXX	STATUS	NEW
DRAWING INFORMATION			
TITLE	Manual & Automatic Fire Alarm System Design Submittal		
SCALE	1:96	1/8"=1'-0"	PLOT SIZE 24"X36"
NAME	Sample Shop Drawing.1.dwg		SHEET 1 OF 2

7.4.5 Floor Plan Drawings , Drawn
to an Indicated Scale

Project Information

Project Name

Street Address, Suite #

City, State & Zip

Permit Number

Construction Type

System Description Title

Drawing Scale

Plot Size

Drawing Name

Sheet 1 of 2

Figure 3g

Design Information

DESIGN INFORMATION										
BUILDING/FIRE CODE	IFC-2012	OTHER	DFPS (§746.5311)							
OCCUPANCY GROUP	I-4 Daycare	SUPERV STATION	Central Station							
OCCUPANCY LOAD	50	SYSTEM TYPE	Analog Addressable							
SPRINKLER PROT	Full Wet Sprinkler	WIRING CLASS	SLC	A	IDC	A	NAC	B		
CONTRACTOR INFORMATION										
(7.4.4.2) NAME OF INSTALLER OR CONTRACTOR	NAME	Company Name					DESIGNED BY	Jane Doe		
	COMPANY ADDRESS	Street Address					LICENSE No	APS-xxxx		
		City, State Zip					DATE	07/24/17		
	LICENSE #	ACR-xxxx	PHONE	(xxx) xxx-xxxx			REVISION	08/15/17		

§34.619(c) number of the licensee, the name, address, phone number, and the certificate of registration number of the registered firm
(7.4.4.5) Date of Issue and any revision dates

Design Information

Building/Fire Code	Other Governing Laws	Prosper Amendments
Occupancy Classification	Occupant Load	Supervising Station Type
System Type	Sprinkler Protection Type	Wiring Classification(s)

Contractor Information

Full Company Name	Street Address, Suite #	City, State & Zip
Designed By	License Number	Date Drawn
Company License Number	Office Phone Number	Revision Date(s)

Figure 3h

Plan Review & Record Drawings Stamp

§34.619(d) Plan review and
record drawings stamp with
original signature

<input checked="" type="checkbox"/> FOR SUBMITTAL	<input type="checkbox"/> RECORD DRAWINGS
I have reviewed these plans and	
<input checked="" type="checkbox"/> certify that they comply with the applicable codes and standards	
Or	
<input type="checkbox"/> certify they were copied from sealed engineering plans and any violations of the applicable codes or standards are specifically noted on these plans.	
Company Name	
Street Address	
City State Zip	
ACR-xxxx xxx-xxx-xxxx	
APS-xxxx	
APS Licensee Signature	License #
Jane Doe	10/24/17
APS Printed Name	Date

Figure 3i

Fire Alarm Control Unit Battery Calculation Table

ITEM	DESCRIPTION	STANDBY CURRENT PER UNIT (AMPS)		QTY	=	STANDBY CURRENT PER UNIT (AMPS)	ALARM CURRENT PER UNIT (AMPS)		QTY	=	SYSTEM ALARM CURRENT (AMPS)		
A	FACU	0.1200	X	1	=	0.1200	1.5000	X	1	=	1.5000		
B	Smoke Det	0.0005	X	42	=	0.0210	0.0010	X	42	=	0.0420		
C	Duct Det	0.0005	X	16	=	0.0080	0.0010	X	16	=	0.0160		
D	Horn/Strobe	none	X	14	=	none	0.0950	X	14	=	1.33		
E	Strobe	none	X	6	=	none	0.0720	X	6	=	0.4320		
F	Relay	0.0070	X	4	=	0.0280	none	X	4	=	none		
			X		=			X		=			
			X		=			X		=			
			X		=			X		=			
			X		=			X		=			
TOTAL SYSTEM STANDBY CURRENT (AMPS)						0.1770	TOTAL SYSTEM ALARM CURRENT (AMPS)						3.32

REQUIRED OPERATING TIME OF SECONDARY POWER SOURCE FROM NFPA 72 10.6.7.2.1

STANDBY: 24 HOURS ALARM: 5 MINUTES × 1/60 = 0.0833 HOURS

REQUIRED STANDBY TIME (HOURS)		TOTAL SYSTEM STANDBY CURRENT (AMPS)	=	REQUIRED STANDBY CAPACITY (AMP-HOURS)	REQUIRED ALARM TIME (HOURS)		TOTAL SYSTEM ALARM CURRENT (AMPS)	=	REQUIRED ALARM CURRENT (AMP-HOURS)
24	X	0.1770	=	4.2480	0.0833	X	3.32	=	.2766

REQUIRED STANDBY CAPACITY (AMP-HOURS)		REQUIRED ALARM CAPACITY (AMP-HOURS)	=	TOTAL REQUIRED CAPACITY (AMP-HOURS)	FACTOR OF SAFETY	REQUIRED BATTERY CAPACITY (AMP-HOURS)
4.2480	+	.2766	=	4.5246	X 1.2	5.43

Sample Battery Calculation.

Figure 4

Voltage Drop Calculation Table

Distributed-Load Voltage-Drop (V_d) Method

Circuit Wire Gauge <u>16</u>				Pair Resistance <u>5.16</u>				
(where wire gauge varies, enter gauge between devices in Column 3)								
Starting Voltage (24 Volts maximum) <u>20.4</u>								
Input Data				Calculations				
Device Number	Current per Device	Wire Gauge	Pair Length (Feet)	Cumulative Pair Length	Cumulative Device Current	V _d per Device	Cumulative V _d	Volts Available at Device
1	.123		50	50	.123	.280	.280	23.72
2	.123		100	150	.246	.495	.775	23.22
3	.123		150	300	.369	.647	1.422	22.58
4	.105		75	375	.474	.275	1.697	22.30
5	.137		75	450	.611	.235	1.932	22.07
6	.137		100	550	.748	.243	2.175	21.83
7	.105		125	675	.853	.215	2.390	21.61
8	.105		50	725	.958	.059	2.449	21.55
9	.123		75	800	1.081	.048	2.497	21.50
10								
11								
12								
13								
14								
15								

Lumped-Load Voltage-Drop (V_d) Method (Optional)

Device Current	Number Each Device Type	Cumulative Device Current	Calculations	
.123	4	.492	Circuit Wire Gauge	16
.105	3	.315	Pair Resistance(OHMS/1000 FT)	5.16
.137	2	.274	Total Pair Length	800
			Total Device Current	1.081
	Total	1.081	Lumped-Load Voltage Drop	4.462

(Device Current X Number Each Device Type = Cumulative Device Current)

(Pair Resistance X Total Pair Length X Total Device Current = Lumped-Load Voltage Drop)

Figure 5

Other Resources for Guidance

The following assist to establish clarity with the minimum compliance requirements for the installation and modification of fire alarm systems as prescribed by national codes & standards, state regulations and as adopted by local ordinance. **Please Note:** Links to this information are under the “Important Website Links” on the Fire Marshal’s Website Page @ www.prospertx.gov/fire-department/fire-marshal

Texas Insurance Code Chapter 6002 (formerly Article 5.43-2) Fire Detection and Alarm Device Installation and 28 TAC §§ 34.600 The Fire Alarm Rules - summer 2016

- Sec. 6002.003. Effect on Local Regulation
- §34.607. Adopted Standards
- §34.611. Licenses and Approvals
- §34.616. Sales, Installation, and Service (b)(1), (4)
- §34.617. Certification
- §34.618. Installation Inspections
- §34.619. Fire Alarm and Detection System Plans and Record Drawings
- §34.620. Installation Labels
- §34.622. Inspection/Test Labels
- SF-035 – Fire Alarm Installation Certificate
- SF-229 – Work Permitted by Type of License

International Fire Code, 2015 Edition

- Preface
 - Introduction
 - Development
 - Adoption
 - Maintenance
- Chapter 1 – Scope and Administration
- Chapter 9 – Fire Protection Systems
- Chapter 80 – Referenced Standards

NFPA 72, Most currently published edition

- Chapter 1 – Administration
- Chapter 7 – Documentation
- Chapter 10 – Fundamentals
- Chapter 14 – Inspection, Testing & Maintenance

Town of Prosper Ordinances/Amendments

Fire-Alarm System Guidelines Identified in the Prosper Amendments

All alarm systems new or replacement shall be addressable. Alarm systems serving more than 20 smoke detectors shall be analog addressable.

All alarm systems, new or replacement, shall transmit alarm, supervisory and trouble signals descriptively to the approved supervising station, remote supervisory station or proprietary supervising station as defined in the most currently published edition of NFPA 72, with the correct device designation and location of addressable device identification. Alarms shall not be permitted to be transmitted as a General Alarm or Zone condition.

Addressable and analog systems shall contain alarm histories for the past 100 events.

All fire alarm systems shall be installed in such a manner that a failure of any single initiating device or single open in an initiating circuit conductor will not interfere with the normal operation of other such devices. All signaling line circuits (SLC) shall be installed in such a way that a single open will not interfere with the operation of any addressable devices (Class A). Outgoing and return SLC conductors shall be installed in accordance with current NFPA 72 requirements for Class A circuits and shall have a minimum of four feet separation horizontal and one foot vertical between supply and return circuit conductors. The initiating device circuit (IDC) from an addressable input (monitor) module may be wired Class B, provided the distance from the addressable module to the initiating device is ten feet or less.

Where the fire-alarm control panel is not visible from the front (main) entry, a remote annunciator shall be located at the entry and in the sprinkler riser room. A sign shall be provided to identify the Main Panel location.

All fire alarm wire jacketing shall be Red in color, however utilizing color striping for circuit designation is acceptable as long as the base jacket is Red in color.

Systems shall be restorable without the use of a code or any special knowledge. This can be accomplished through the use of buttons or switches located at the remote annunciator or main control panel.

The main power shall be from a dedicated circuit. The location of the branch circuit disconnecting means shall be permanently identified at the control unit and at the power source. For fire alarm and/or signaling systems, the circuit disconnecting means shall have a red marking. Where a circuit breaker is the disconnecting means, an approved breaker locking device shall be installed. An overcurrent protective device shall be provided in accordance with *NFPA 70*.

Secondary power source utilizing batteries shall be marked with a label of contrasting colors (*white background with black numbers/letters*). The label shall indicate the month and year of manufacture using the month/year format. Where the battery is not marked with the month/year by the manufacturer, the installer shall obtain the date-code and mark the battery with the month/year of battery manufacture.

Battery and voltage-drop calculations, in formats similar to those provided in Figure 5, page 17 and Figure 6, page 18, that include all input values for verification. Where summary or average values are input, the derivation of these values must be provided.

All manual fire-alarm pull-boxes shall be of the double-action type and Red in color.

Occupant notification in accordance with this section and 907.5 shall be required for all new construction, or existing construction complying with the International Building Code, for renovations to existing buildings, tenant spaces, changes in occupancy, replacement or modification of the existing fire alarm system, or as required by the fire code official, for all buildings or spaces provided with an approved automatic sprinkler system.

When required by Section 903.4.2, an exterior audible and visible notification appliance shall be provided on the exterior of the building and shall be located above the remote Fire Department Connection. The notification appliance shall operate on a waterflow alarm only, shall be non-silenceable and shall continue to operate after the panel is silenced on the condition the alarm was a waterflow alarm only.

The notification appliance shall be wired from the fire alarm control panel as a dedicated latching circuit. The alarm appliance required on the exterior of the building shall be a weatherproof horn/strobe with a minimum 75 candela strobe rating, installed as close as practicable to the fire department connection. When the project has a remote fire department connection a 2nd weatherproof horn/strobe with a minimum 75 candela strobe rating shall be mounted not less than (7') seven feet above finished grade above the FDC connection.

Elevator Recall and Shunt Trip

State and local codes regulate elevator installations. Codes that effect fire safety are summarized in this section.

Elevator recall

- Elevator recall shall be from a smoke detector activation in the elevator lobby, or machine room
- Detectors in elevator lobby and machine rooms shall be smoke type in conditioned spaces and heat detectors in unconditioned spaces.
- Elevator machine rooms **without** fire sprinklers shall contain smoke detector(s) for recall only. Where the rooms are unconditioned, heat detectors shall be provided (135° to 165°)

Fire sprinklers shall not be installed in the top of elevator shafts or in the elevator machine rooms.

Exception:

NFPA 13 – 9.3.6.1* Sidewall spray sprinklers shall be installed at the bottom of each elevator hoistway not more than 2 ft. (600 mm) above the floor of the pit.

NFPA 13 – 9.3.6.2. The sprinkler required at the bottom of the elevator hoistway by 9.3.6.1 shall not be required for enclosed, noncombustible elevator shafts **that do not contain** combustible hydraulic fluids.

NFPA 72 - 21.3.8* When sprinklers are required in elevator hoist-ways by other codes and standards, fire alarm initiating devices shall be installed to initiate Elevator Phase I Emergency Recall Operation in accordance with ANSI/ASME A17.1/CSA B44, Safety Code for Elevators and

Escalators, and the following shall apply:

- (1) Where sprinklers are located at the top of the hoistway, the fire detection device(s) shall be located at the top of the hoistway.
- (2) Where sprinklers are located at the bottom of the hoistway (the pit), fire detection device(s) shall be installed in the pit in accordance with Chapter 17.
- (3) Outputs from the fire alarm system to the elevator system shall comply with 21.3.14.
- (4) The fire alarm initiating device(s) shall be installed in accordance with Chapter 17.

TDLR §74.100. Technical Requirements--ASME and ASCE Codes.

(a) The commission adopts the standards for the installation, maintenance, repair, replacement, alteration, testing, operation, and inspection of equipment that are contained in the following codes:

- (1) ASME Code A17.1-2007/CSA B44-07 as amended in subsection (b)
- (2) ASME Code A17.3-2002
- (3) ASME Code A18.1-2005; and
- (4) ASCE Code 21.

Chapter 74, Elevators, Escalators and Related Equipment

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Elevator shunt trip:

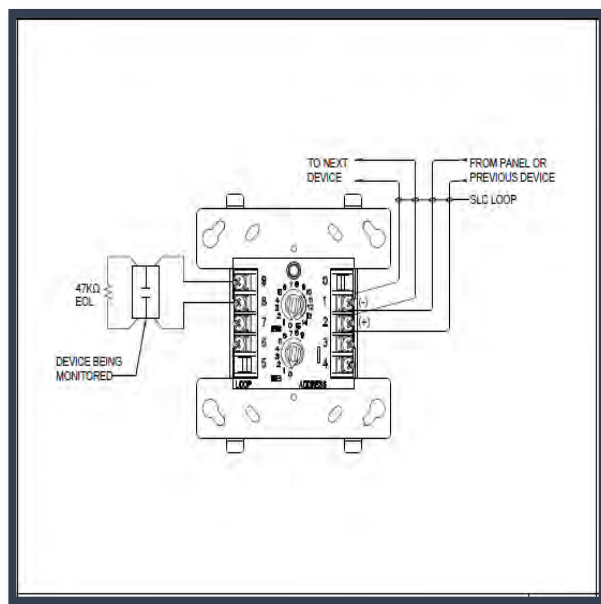
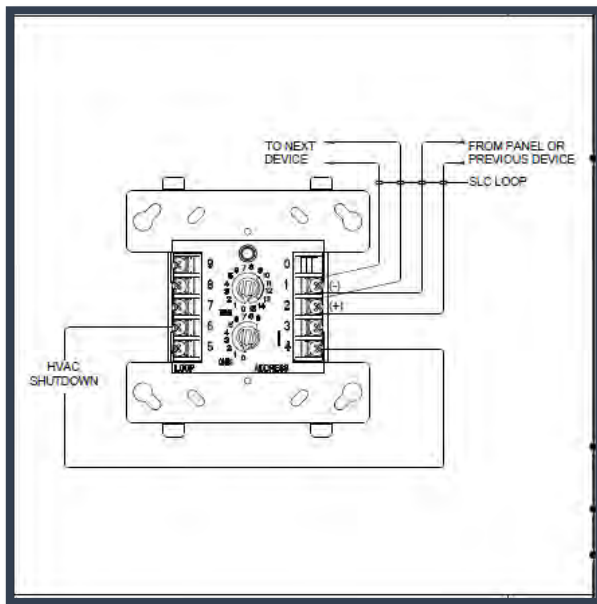
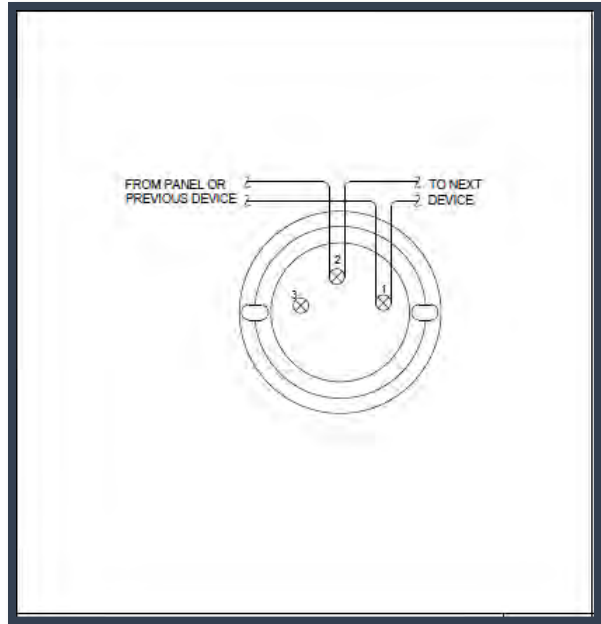
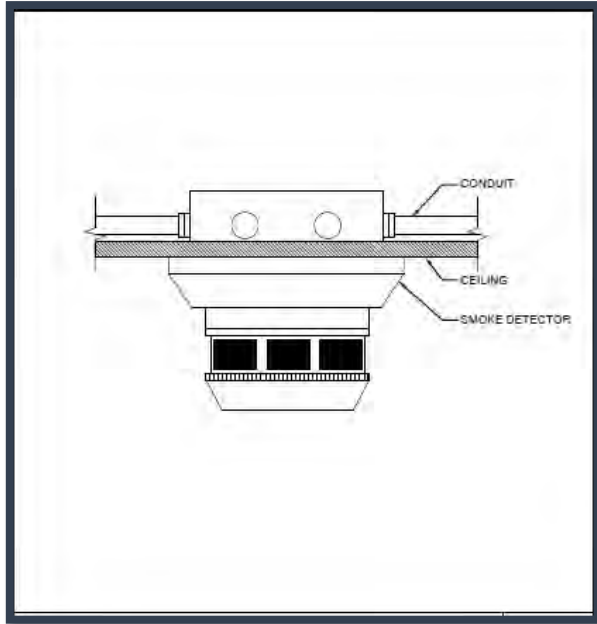
- Passenger elevator shafts and elevator machine rooms are exempt from power shunting when sprinkler suppression is not present. Freight elevator systems and hydraulically operated passenger systems may not be exempt from this requirement. Please consult ASME Code A17.1-2007/CSA B44-07 *Safety Code for Elevators and Escalators*, NFPA 13 and NFPA 72 for further clarity.

Elevator cars shall be provided with a 2-way communication system. The communication system must be connected to either a constantly attended (*24 hour*) location or to an UL-listed monitoring station.

Figure 8

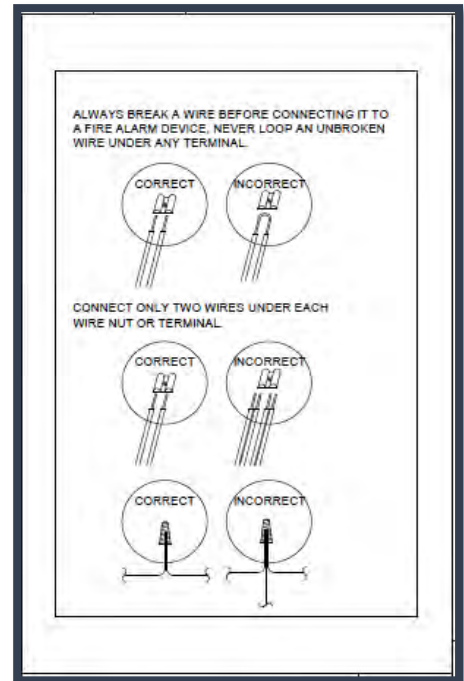
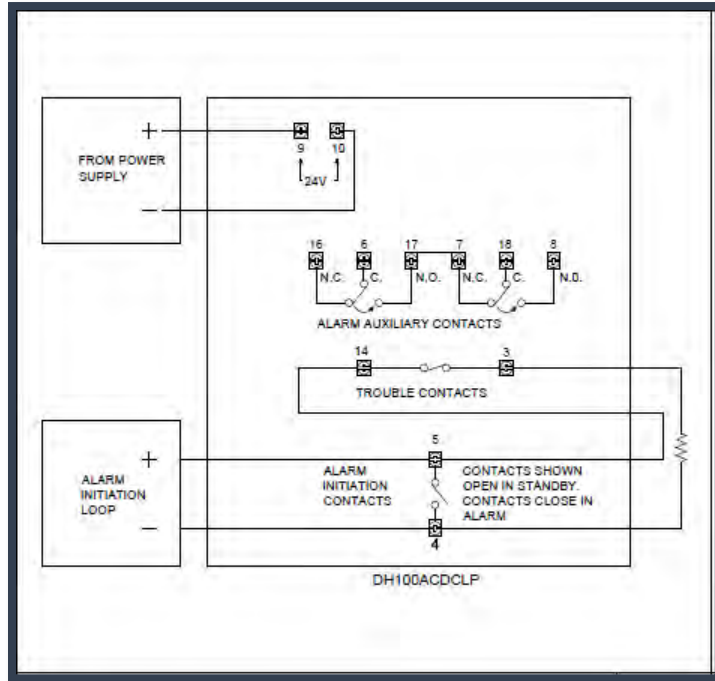
Example Device Wiring & Installation Diagrams

NFPA 72 - 7.4.8 Typical wiring diagrams shall be provided for all initiating devices, notification appliances, remote indicators, annunciators, remote test stations, and end-of-line and power supervisory devices.

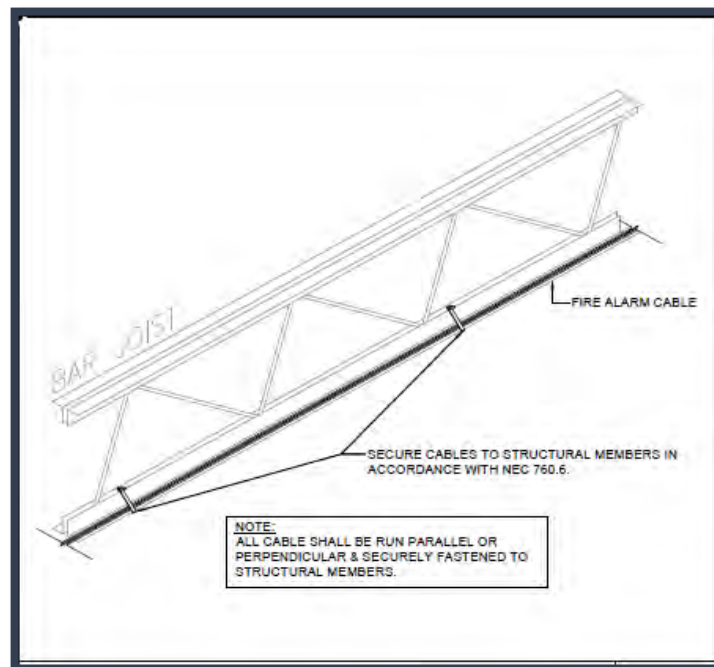


Example Device Wiring & Installation Diagrams *continued*

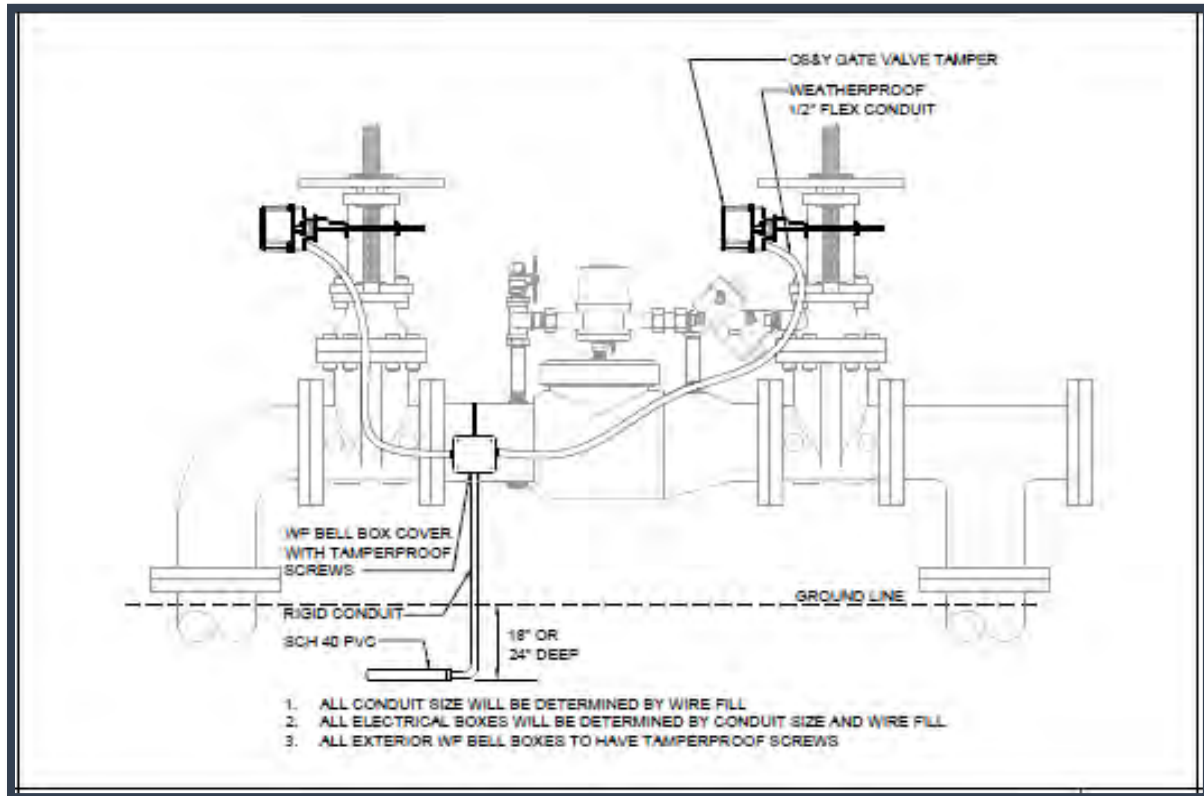
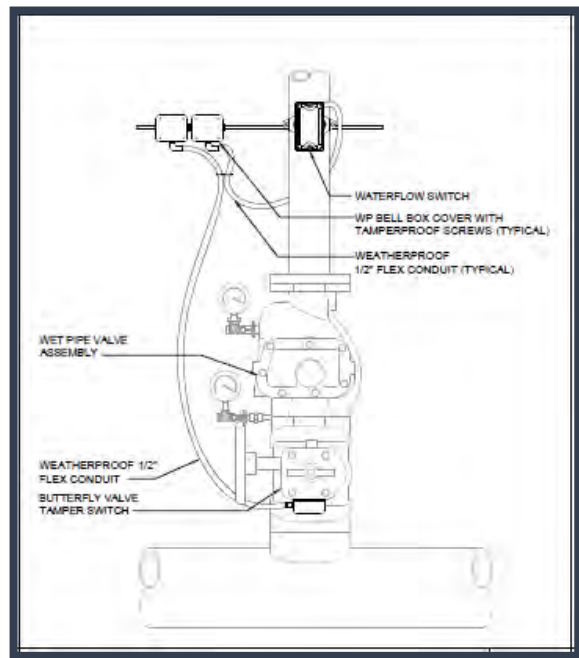
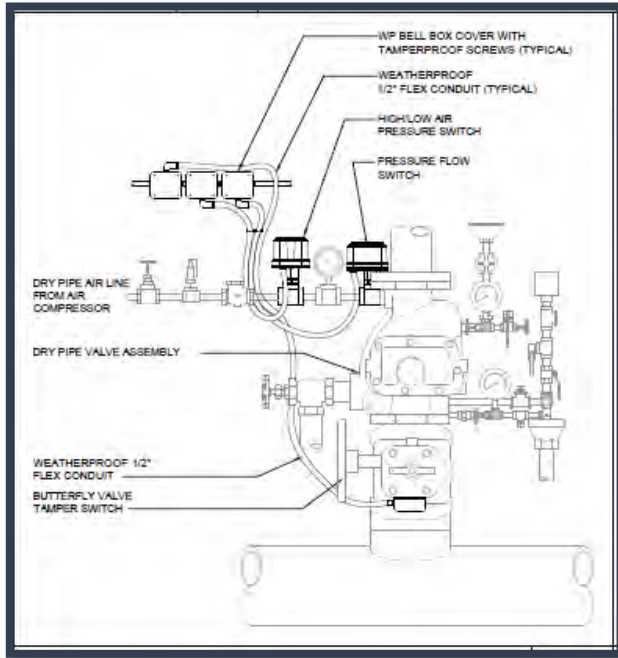
NFPA 72 - 7.4.8 Typical wiring diagrams shall be provided for all initiating devices, notification appliances, remote indicators, annunciators, remote test stations, and end-of-line and power supervisory devices



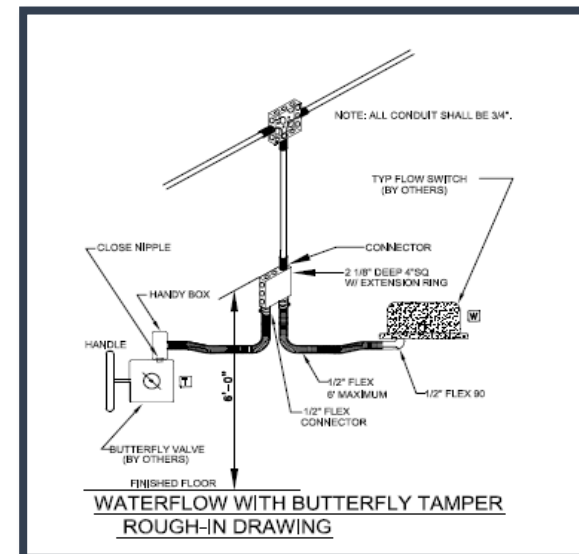
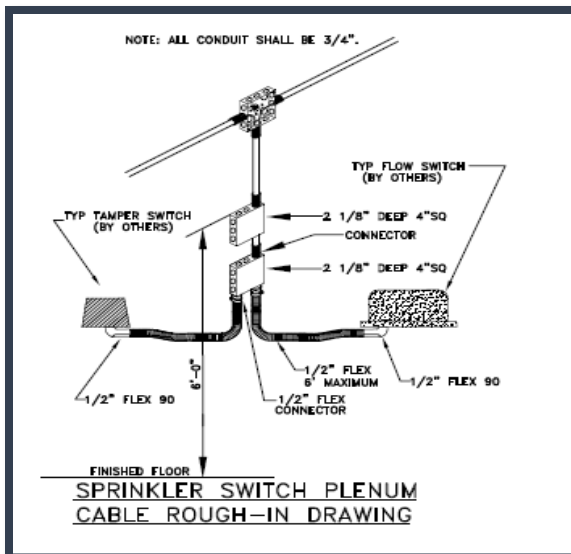
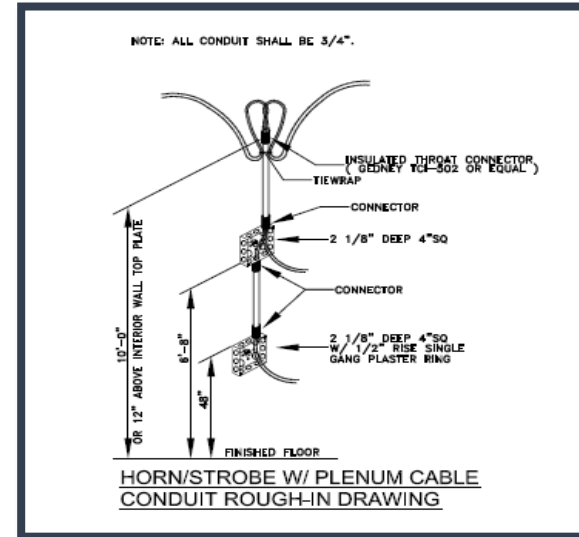
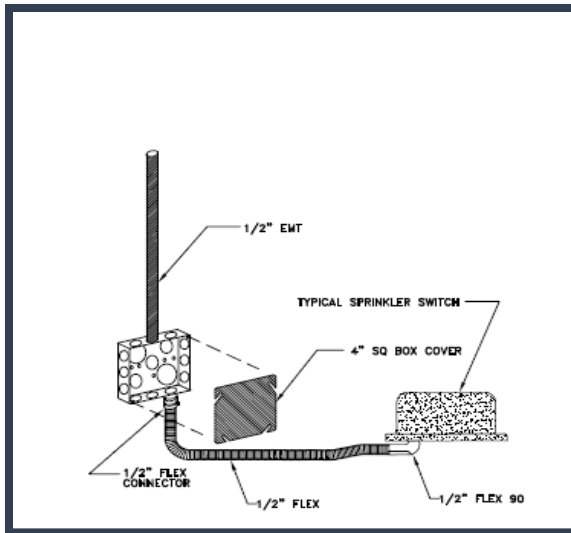
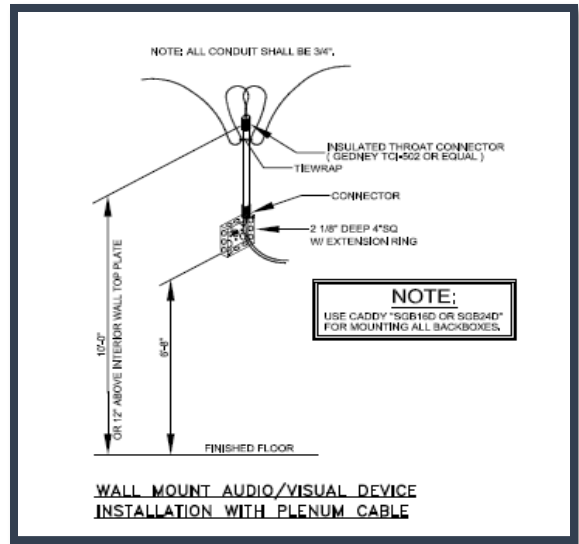
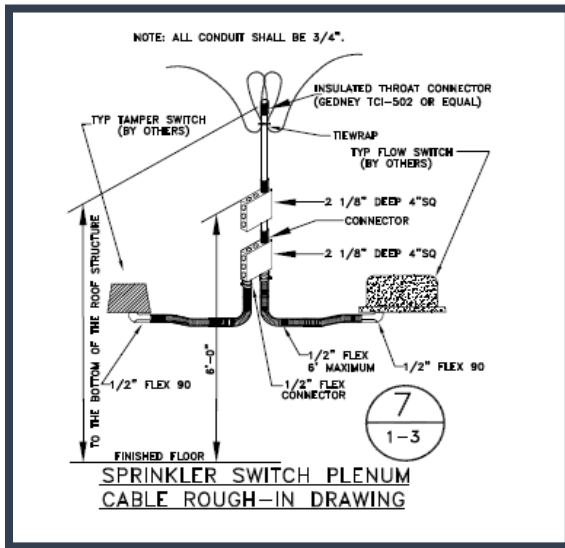
Example Installation Diagrams



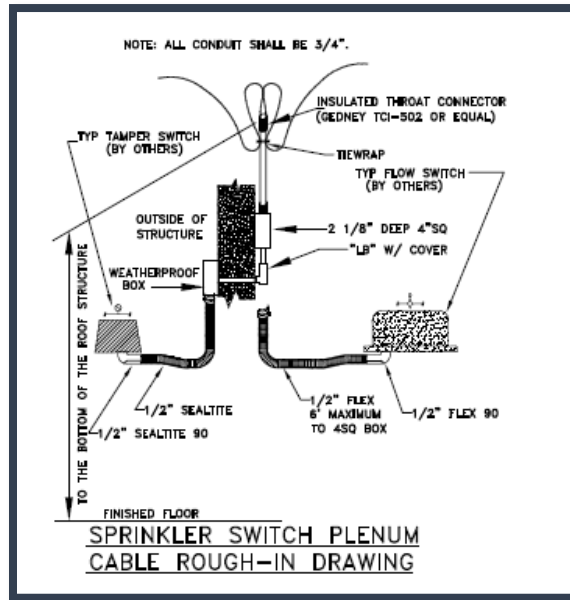
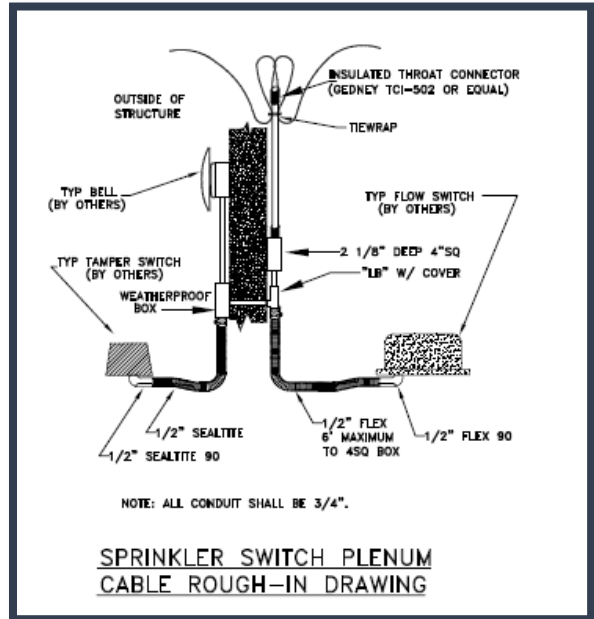
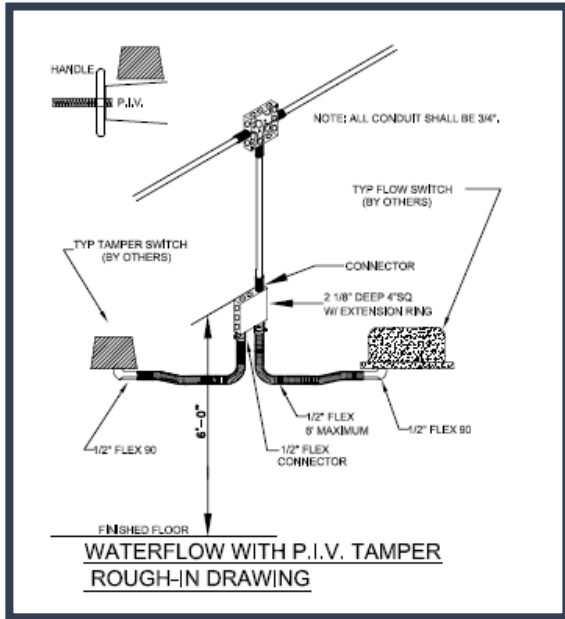
Example Installation Diagrams *continued*



Example Installation Diagrams *continued*



Example Installation Diagrams *continued*



NFPA Supervising Station Communication Methods

The Town of Prosper recognizes the rapidly retreating support of traditional analog copper based telephone communications methods in favor of newer transmission technologies with their attendant advances in communication capability. In consideration of the impact these advances must have on supervising station fire alarm system communication capabilities now and into the future, the Town of Prosper embraces and promotes the use of listed equipment using alternate communication methods described in chapter 26 of NFPA72 2013-2016 editions.

All methods of communications between the protected premises and a Listed/Approved Supervising Station are accepted in the Town of Prosper as long as they comply with:

- Federal Communications Commission Rules & Regulations as applicable
- The manufacturers product as Listed and/or F.M. Approved for such Services
- If providing a “Performance Based Design”, it must compliant with all of the above, reviewed and approved by a Registered Fire Protection Engineer and Acceptable to the A.H.J.
- Compatibility between the manufactured product and the supervising station

If you require further clarification please consult and provide this document to your registered Alarm Planning Superintendent (APS), registered Fire Protection Engineer (FPE), manufacturers’ product or the third party supervising station representative.

FCC Ruling

FCC ruling 14-5A1 dated 01-30-2014 established regulations that will accommodate the nation’s telephone service providers to begin the phasing out of hard wire (*copper*) telephone lines (*POTS*) and *Publically Switched Telephone Networks*. Accordingly; the current edition of NFPA 72 recognizes this action and has established restrictive methods of communications utilizing a Digital Alarm Communications System (*DACT*). Please reference NFPA 72, Chapter 26, section 26.6.3.2 Digital Alarm Communicator Systems for clarity.

Further Clarification Excerpts from NFPA 72, 2019 Edition Handbook

National Fire Alarm and Signaling Code Handbook, 2019 Edition

[26.6 Communications Methods for Supervising Station Alarm Systems.](#)

Three classifications of communications methods are addressed in the Code. The transmitters for these methods are situated at the protected premises. The first classification includes performance-based technologies, which are covered in 26.6.3. This classification includes technologies that at one time were called “other technologies.” These technologies include equipment such as IP communicators and global system for mobile (GSM) communications. Legacy technologies are also included under the performance-based grouping. For the most part, legacy technologies are no longer being installed but may exist in some installations. Finally, performance-based technologies can include any newly developed communications method that can meet the requirements of 26.6.3.

The second communications classification includes the digital alarm communicator system (DACS), addressed in 26.6.4. These systems use a DACT at the protected premises and a DACR at the supervising station.

The third communications classification includes radio systems, which are covered in 26.6.5. This classification is split into two types of radios. Paragraph 26.6.5.1 provides the requirements for two-way radio frequency (RF) multiplex systems. Paragraph 26.6.5.2 provides the requirements for one-way private radio alarm systems, which are more common. These communications methods are addressed in more detail in subsequent commentary.

Exhibit 26.9 illustrates the communications methods addressed by the Code.

26.6.1* Application.

26.6.4.1.4 Transmission Channels.

(A) A system employing a DACT shall employ a single telephone line (number) and one of the following transmission means shall be employed:

- (1) One-way private radio alarm system
- (2) Two-way RF multiplex system
- (3) Transmission means complying with 26.6.3
- (4) A second telephone line (number), where all of the following are met:
 - (a) Access to one of the technologies in (1), (2), or (3) is not available at the protected premises.
 - (b) The authority having jurisdiction approves the arrangement.
 - (c) The DACT is programmed to call a second DACR line (number) when the signal transmission sequence to the first called line (number) is unsuccessful.
 - (d) The DACT is capable of selecting the operable means of transmission in the event of failure of the other means.
 - (e) Each telephone line is tested in accordance with 26.6.4.1.4(B) or at alternating 6-hour intervals.

NFPA Supervising Station Communication Methods *continued*

[NFPA 72 - Commentary](#)

Paragraph 26.6.4.1.4 provides the DACT with two reasonably reliable means of connecting to the DACR. Note that the Code has no jurisdiction over utility-provided services such as telephone services. Thus, the Code must rely on the traditionally accepted inherent reliability of all such utility-provided services. See also the commentary and the Closer Look feature following A.26.6.4.1.1.

Due to the decreased reliability of both traditional and MFVN-based PSTNs, this does not permit the use of a second telephone line (number) as the second transmission means for a DACT. Several of the other transmission choices are not included either because they are no longer available or were never used, such as derived local channel, integrated services digital network (ISDN), and private microwave radio. The traditional cell phone service that had to dial a number is also not permitted. However, digital cellular radio using ubiquitous 2G, 3G, 4G, and 5G wireless networks is capable of meeting the performance-based requirements of 26.6.3.

The distinction between a DACTS that meets the requirements of 26.6.4 and a system using performance-based technology that meets the requirements of 26.6.3 is particularly important for designers and authorities having jurisdiction to understand. In many cases, this second system employs a listed DACT connecting to a listed module (sometimes called an IP communicator) that transmits as a packet switched network through an IP broadband data connection to the Internet. See the commentary following Section 26.6. Both systems must comply with the distinct requirements of the applicable section of the Code. The requirements of 26.6.4 do not need to be applied to systems addressed under the requirements of 26.6.3 even though they may employ a listed module interfacing with a listed DACT. The equipment manufacturer's published instructions are required to be followed in these situations, in addition to the requirements of 26.6.3.

It is estimated that the migration to performance-based technologies will continue until the vast majority of DACTs use IP broadband data communications technology or a yet-to-be-developed equivalent.

26.6 Communications Methods for Supervising Station Alarm Systems.

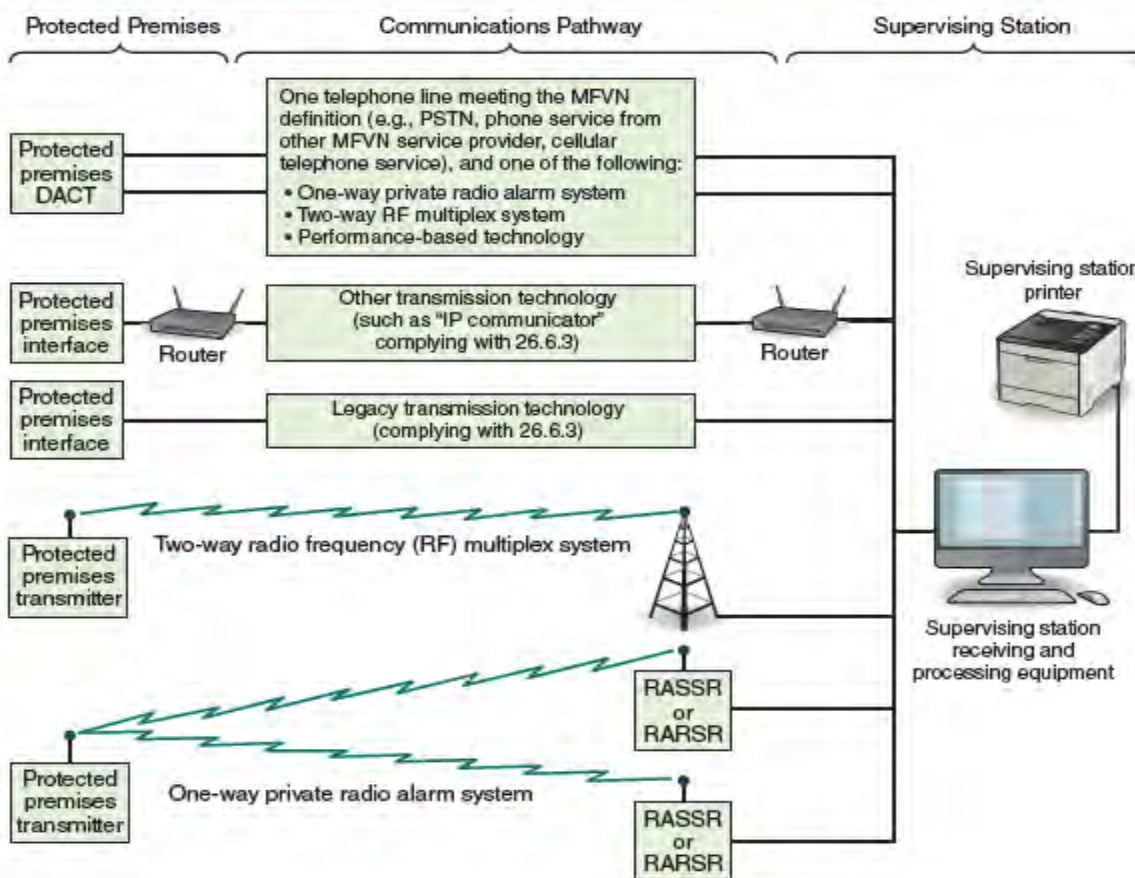
There are five communications methods addressed in the Code. The first communications method is a digital alarm communicator system (DACS), addressed in 26.6.4, which uses a DACT at the protected premises. The second method is a more general category of performance-based communications methods, addressed in 26.6.3, which uses what was formerly called "other technology" such as an "IP communicator" at the protected premises. The third method is the category known as "legacy" transmission technologies, which are no longer being installed and are addressed only conceptually in 26.6.3 (see also A.26.6.3). The fourth and fifth communications methods are two types of radio systems, addressed in 26.6.5, that use radio transmitters at the protected premises. All these communications methods are addressed in more detail in subsequent commentary.

Exhibit 26.9 illustrates the communications methods addressed by the Code.

26.6.1* Application.

A.26.6.1 Refer to Table A.26.6.1 for communications methods.

EXHIBIT 26.9



Communications Methods for Supervising Station Alarm Systems.

Figure 9

Town of Prosper, Texas Ordinance/Amendments

Fire Alarm Only

(Visit www.prospertx.gov/fire-department/fire-marshal/ for a complete copy of our amendments)

Section 907.1.4 shall be added to read as follows:

907.1.4. Design Standards. All alarm systems new or replacement shall be addressable. Alarm systems serving more than 20 smoke detectors shall be digital and/or analog addressable.

Riser rooms shall be equipped with an annunciator panel.

Exception: Existing systems need not comply unless the total building remodel or expansion initiated after the effective date of this code, as adopted, exceeds 30% of the building. When cumulative building remodel or expansion exceeds 50% of the building, must comply within 18 months of permit application.

Section 907.2.1 shall be amended to read as follows:

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group “A” occupancies having an occupant load of 300 or more persons or more than 100 persons above or below the lowest level of exit discharge. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Activation of fire alarm notification appliances shall:

1. Cause illumination of the means of egress with light of not less than 1 foot-candle (11 lux) at the walking surface level, and
2. Stop any conflicting or confusing sounds and visual distractions.

Section 907.2.3 shall be amended to read as follows:

907.2.3 Group E. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group E educational occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system. An approved smoke detection system shall be installed in Group E day care occupancies. Unless separated by a minimum of one hundred feet (100') of open space, all buildings, whether portable buildings or the main building, will be considered one building for alarm occupant load consideration and interconnection of alarm systems.

Section 907.2.3 shall be amended to amend Exception 1 and to add

Exception 1.1 to read as follows:

Exceptions:

1. A manual fire alarm system is not required in Group E educational and day care occupancies with an occupant load of less than 50 when provided with an approved automatic sprinkler system.
 - 1.1. Residential In-Home day care with not more than (12) children may use interconnected single station detectors in all habitable rooms. For care of more than five children 2 ½ or less years of age, see Section 907.2.6.)

Section 907.2.13, Exception 3 shall be amended to read as follows:

Open air portions of buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the International Building Code; however, this exception does not apply to accessory uses including but not limited to sky boxes, restaurants and similarly enclosed areas.

Section 907.4.2.7 shall be added to read as follows:

Section 907.4.2.7 Type. Manual alarm initiating devices shall be an approved Red, double action type.

Town of Prosper, Texas Ordinance/Amendments *continued*

Fire Alarm Only

Section 907.5.3 shall be added to read as follows:

Occupant notification in accordance with this section and 907.5 shall be required for all new construction, or existing construction complying with the International Building Code, for renovations to existing buildings, tenant spaces, changes in occupancy, replacement or modification of the existing fire alarm system, or as required by the fire code official, for all buildings or spaces provided with an approved automatic sprinkler system.

Section 907.6.1.1 shall be added to read as follows:

907.6.1.1 Wiring Installation. (Class A). Outgoing and return SLC conductors shall be installed in accordance with NFPA 72 requirements for Class A circuits and shall have a minimum of four feet separation horizontal and one foot vertical between supply and return circuit conductors. The initiating device circuit (IDC) from an addressable input (monitor) module may be wired Class B, provided the distance from the addressable module to the initiating device is ten feet or less.

All fire alarm wire jacket shall be RED in color. A contrasting color stripe may be incorporated for circuit identification provided the base color of the fire alarm wire jacket is RED.

Section 907.6.7 shall be added to read as follows:

907.6.7 Waterflow Notification. When required by Section 903.4.2, an exterior audible and visible notification appliance shall be provided on the exterior of the building **and shall be located above the Fire Department Connection.** The notification appliance shall operate on a waterflow alarm only, shall be non-silenceable and shall continue to operate after the panel is silenced on the condition the alarm was a waterflow alarm only.

The notification appliance shall be wired from the fire alarm control panel as a dedicated latching circuit. Minimum candela rating for the notification appliance shall be 75 (cd) candela.

Section 903.4.2 shall be amended to add a second paragraph to read as follows:

The alarm appliance required on the exterior of the building shall be a weatherproof horn/strobe notification appliance with a minimum 75 candela strobe rating, installed as close as practicable to the fire department connection.

Section 907.6.3.2 shall be added to read as follows:

907.6.3.2 Communication requirements. All alarm systems, new or replacement, shall transmit alarm, supervisory and trouble signals descriptively to the approved supervising station, remote supervisory station or proprietary supervising station as defined in NFPA 72, with the correct device designation and location of addressable device identification. Alarms shall not be permitted to be transmitted as a General Alarm or Zone condition.

Section 907.10 shall be added to read as follows:

907.10. Fire extinguishing systems. Automatic fire-extinguishing systems shall be connected to the building fire alarm system where a fire alarm system is required by another section of this code or is otherwise installed.