

CODE REQUIREMENTS.

ENGINEER.

ASSEMBLY, RACEWAY OR ENCLOSURE.

10. THE OUTGOING & RETURN CIRCUIT CONDUCTORS SHALL NOT BE RUN IN THE SAME CABLE

SUPPLY NETWORK FOR BELLS, STROBE LIGHTS, FIRE AND SMOKE DAMPERS AND DOOR HOLDERS. SUPPLY TO BE FROM NEAREST AVAILABLE SOURCE TO THE APPROVAL OF THE

11. PROVIDE 24 VDC AND / OR 12 VDC (AS PER MANUFACTURER REQUIREMENT'S) POWER

FIRE ALARM CONTROL PANEL

DESIGNED BY:

CHECKED BY:

DRAWN BY:

AB

DATE:

PROJECT NO:

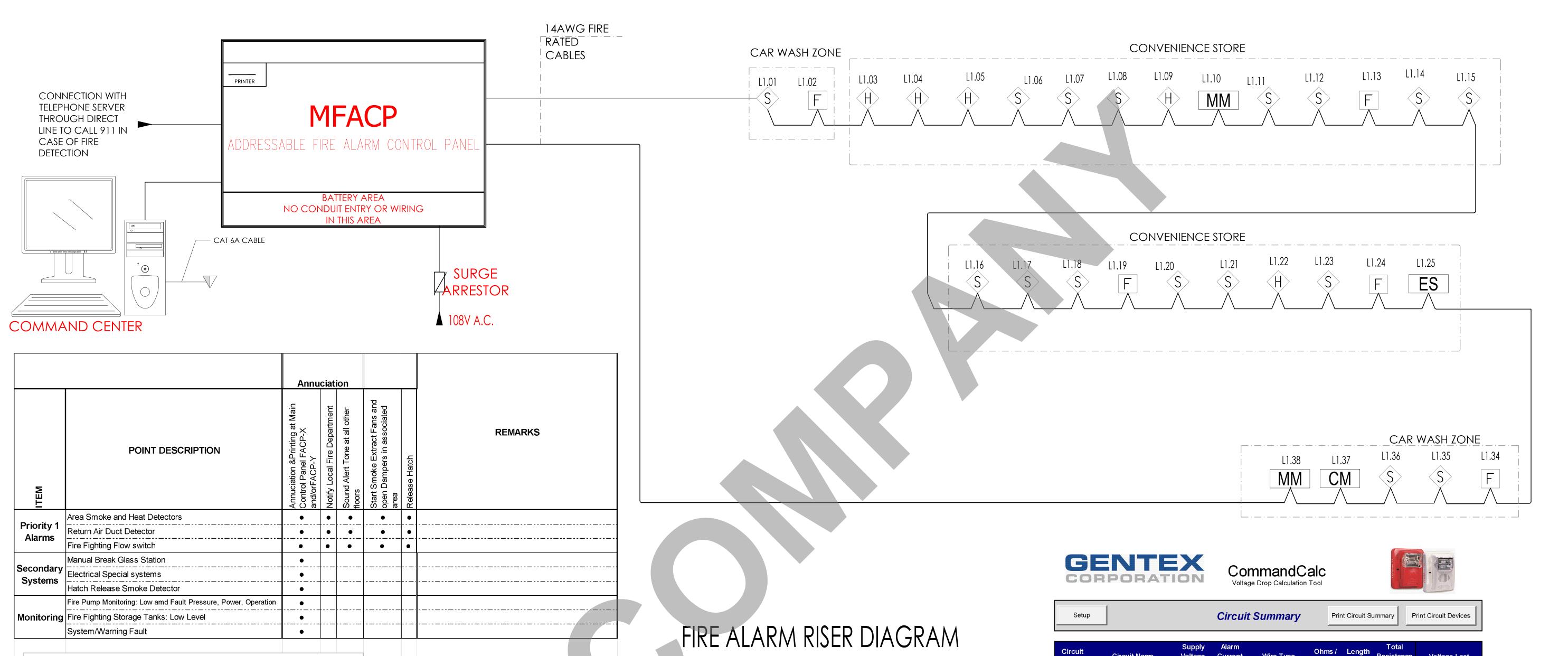
03/2023

DRAWING TITLE:

FIRE ALARM DESIGN MARKET AREA & CAR WASH

SHEET NO:

FA-1.01



ITEM	DESCRIPTION	STANDBY		QTY	TOTAL	ALARM		QTY		TOTAL
		CURRENT			STANDBY	CURRENT				ALARM
		PER UNIT			CURRENT	PER UNIT				CURRENT
		(AMPS)			PER ITEM	(AMPS)	$\overline{A}$			PER ITEM
FACU	Fire Alarm Control Unit	0.1000	Х	1 =	0.1000	0.2000	X	1	=	0.2000
SD	Smoke Detector	0.0010	Χ	16 =	0.0160	0.0500	X	20	=	1.0000
HD	Heat Detector	0.0000	Χ	5 =	0.0000	0.0000	X	6	=	0.0000
RLY	Relay (failsafe)	0.0500	Χ	3 =	0.1500	0.0000	X	1	=	0.0000
RLY	Relay (not failsafe)	0.0000	Χ	0 =	0.0000	0.0500	X	15	=	0.7500
HS	Horn-Strobe	0.0000	Χ	5 =	0.0000	0.0750	X	10	=	0.7500
DH	Door Holder	0.0650	Х	0 =	0.0000	0.0000	X	0	=	0.0000
ANN	Annunciator	0.1000	Х	5 =	0.5000	0.2000	X	1	=	0.2000
MS	Manual Station	0.0000	Χ	5 =	0.0000	0.0000	X	5	=	0.0000
WF	Waterflow Switch	0.0000	X	1 =	0.0000	0.0000	X	4	=	0.0000
TS	Tamper Switch	0.0000	Х	1 =	0.0000	0.0000	Х	4	=	0.0000
0	0	0.0000	Х	0 =	0.0000	0.0000	Х	0	=	0.0000
0	0	0.0000	Х	0 =	0.0000	0.0000	X	0	=	0.0000
				TOTAL SYSTEM		TOTAL SYSTEM				
		STA	NDB	Y CURRENT (AMPS)	0.7660	ALARM CURRENT (AMP			(IPS)	2.9000
<u>Prepared</u>	d for:	REQUIRED		TOTAL	REQUIRED	REQUIRED		TOTAL		REQUIRED
		STANDBY		SYSTEM	STANDBY	ALARM TIME		SYSTEM		ALARM
		TIME (HRS)		STANDBY	CAPACITY	(HOURS)		ALARM		CAPACITY
		NFPA 72-2002		CURRENT	(AMP-HOURS)	NFPA 72-2002		CURRENT		(AMP-
		4.4.1.5.3.1		(AMPS)		4.4.1.5.3.1		(AMPS)		HOURS)
		24	Χ	0.7660 =	18.3840	0.083	Х	2.9000	=	0.2407
Prepare	d by:	REQUIRED		REQUIRED	TOTAL	TOTAL		SAFETY		ADJUSTED
		STANDBY		ALARM	CAPACITY	CAPACITY		FACTOR		BATTERY
		1			1				l	

CAPACITY

(AMP-HOURS) (AMP-HOURS)

CAPACITY

- Time delay to be agreed with local fire department.

- Audio music systems must be interfaced to switch off when alarm sounds.

CAPACITY

					_			
Circuit Number	Circuit Name	Supply Voltage (VDC)	Alarm Current (Rt. Click)	Wire Type	Ohms / 1000 ft.	Length (Feet)	Total Resistance (Ohms)	Voltage Last Device
1	F.1	24	0.429	#14AWG Stranded	3.26	150	0.98	23.58
2	F.2	24	0.286	#14AWG Stranded	3.26	120	0.78	23.78
			0.000				0.00	0.00
			0.000				0.00	0.00
			0.000				0.00	0.00
			0.000				0.00	0.00
			0.000				0.00	0.00
			0.000				0.00	0.00
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	UTION .
VELOPMENT INFORM	MATION:
E ADDRESS:	
SIGNED BY:	
ECKED BY:	
AWN BY:	AB
	PROJECT NO:

03/2023

DRAWING TITLE:

SHEET NO:

FIRE ALARM RISER

SINGLE LINE DIAGRAM

**FA-2.01** 

DATE DESCRIPTION

## **S**Simplex

UL, ULC, CSFM Listed; FM Approved; MEA (NYC) Acceptance\*

#### **Features**

TrueAlarm detection with TrueSense operation combines photoelectric detection with heat detection to provide a multi-mode detector with *four* detection mechanisms:

- Stable and reliable photoelectric smoke detection with built-in **TrueAlarm** sensitivity drift compensation
- Resettable, thermistor-based fixed temperature detection
- Resettable, thermistor-based rate-of-rise temperature detection
- And **TrueSense detection**, a patented correlation of smoke activity and thermal activity providing intelligent fire detection earlier than with either activity alone

#### Functional chamber enclosure:

- Louvered design enhances smoke capture by directing flow to chamber
- Entrance areas are minimally visible when ceiling mounted
- Operation is for ceiling or wall mounting

### Multi-function LED indicator:

- Indicates normal and alarm conditions
- Provides status during magnetic functional test

### Magnetically operated functional test:

- Initiates alarm and verifies performance
- Identifies general sensitivity status using detector LED pulses (normal, more sensitive, or less sensitive)
- With detectors categorized as normal or needing cleaning or other service, maintenance priorities can be more easily determined

#### **Available options:**

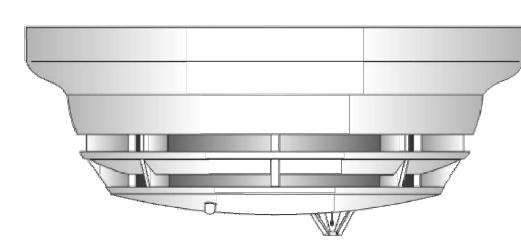
- Bases for 2-wire or 4-wire operation
- Auxiliary alarm relay output
- Remote alarm indicating LED

## Designed for EMI compatibility

**UL listed to Standard 268** 

## **True Alarm Smoke Detectors**

TrueAlarm Photoelectric Smoke Detector with TrueSense Smoke/Heat Detection



4098-9602 TrueSense Detector Mounted in Base

## Description

Simplex® 4098-9602 detectors combine photoelectric smoke detection technology and quick response thermistor-based heat detection technology into a sophisticated, intelligent detector that analyzes *each* of these activities *and their combination* to determine whether alarm conditions are present.

Four Detection Modes. An onboard microprocessor provides four independent detection modes: photoelectric detection with TrueAlarm sensitivity drift compensation, fixed temperature heat detection, rate-of-rise temperature heat detection, and TrueSense photoelectric/heat trending analysis and alarm detection. If any of these alarm conditions are experienced, an alarm is initiated.

## **Specifications**

Voltage	15 to 32 VDC, from Control Panel IDC
Standby Current	100 μA @ 24 VDC
Alarm Current, 2-Wire Operation	Up to 86 mA maximum, exact current is determined by alarm current limiting of connected IDC (initiating device circuit)
Alarm Current, 4-Wire Operation	24 mA typical @ 24 VDC
Auxiliary Relay Ratings	Refer to page 3 under Product Selection
Rate-of-Rise Temperature Alarm**	≥ 20° F/min (11° C/min), only in effect at temperatures above 90° F (32° C)
Fixed Temperature Alarm	135° F (57° C)
UL Listed Temp. Range**	32° F to 100° F (0° C to 38° C)
Operating Temp. Range	15° F to 100° F (-9° C to 38° C)
Storage Temp. Range	0° to 140° F (-18° C to 60° C)
Smoke Obscuration Sensitivity	2.8%/ft Nominal, per UL268
Air Velocity Range	0-2000 ft/min (0-610 m/min)
Humidity Range	10% to 95% RH from 32° F to 122° F (0° C to 50° C)
Color	Frost White
Dimensions	4-7/8" Dia. x 2" H, mounted in base (124 mm x 51 mm), refer to p.3 for detail

<sup>\*\*</sup> Always locate this and all rate-of-rise heat detection devices away from extremes of temperature fluctuation.

S4098-0017-4 1/2015

## **S**Simplex

## **MX Technology Addressable Devices**

UL Listed\*

Addressable Smoke and Heat Sensors; Multi-Sensors (Smoke & Heat), Isolator Bases, Sounder Bases, and Accessories

### **Features**

MX Technology addressable smoke sensor, heat sensor and multi-sensor features:

- Smoke Sensors provide accurate photoelectric sensing
   Heat Sensors provide electronic heat sensing with multiple alarm options
- **Multi-Sensors** combine photoelectric sensing with heat sensing
- **Isolator Bases** monitor line condition and separates input from output to isolate short circuits
- Sounder Bases provide multiple tone and volume selections and are available as MX Loop powered, or powered from separate 24 VDC
- Sounder-Beacon Bases are loop powered and provide the sounder base functions plus a visible flashing light
   Accessories include remote LED indicators, address
- Accessories include remote LED indicators, address flags and labels, and base adapters
- Smoke sensors and accessories are listed to UL 268, heat sensors to UL 521

#### Compatibility:

- For use with Simplex® 4100ES, 4010ES and 4100U Series fire alarm control panels equipped with an MX Loop Module
- Analog sensor information is communicated to the host control panel and analyzed using the MX Fastlogic algorithm
- The MX Fastlogic algorithm is considered an Expert algorithm that uses real fire data as a basis for the alarm decision

## Installation and Service Features:

- Each sensor is supplied with an integral dust cover for protection during storage and installation and is easily removed when commissioning the system
- Unique 'park' position for commissioning and service
- The address flag is attached to the base to minimize errors during service
- Detector addressing is conveniently programmed using the MX Service tool
- Bases with multiple mounting options simplify installation

## Description

Rugged Construction. MX compatible 4098-Series sensors provide robust and reliable construction which has undergone stringent environmental testing. Electrical contacts are molded into the plastic to eliminate movement. Construction uses durable, fire resistant FR110 plastic.

**Detection Modes.** MX Sensors communicate to the MX Loop Module using MX Technology communications. This allows each detector to operate in one or two of several detection modes, thus allowing it to be easily optimized to the risk.



4098-5202 Photoelectric Sensor and 4098-5203 Photoelectric Sensor with Heat Sensing



4098-5201 Heat Sensor



Photo Sensor on 4098-5215 Sounder Base



Photo Sensor on 4098-5212 Sounder-Beacon Base

S4098-0045-4 3/2015

NO.	DATE	DESCRIPTION
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SEAL:		
SEAL:		

DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

AB

PRAWING TITLE:
FIRE ALARM CUTSHEET
SHEET 1 OF 2

03/2023

SHEET NO:

FA-3.01

<sup>\*</sup> This product has been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7272-0062:219 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. Accepted for use – City of New York Department of Buildings – MEA35-93E. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Safety Products Westminster.

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## **Simplex**

## True Alert Multi-Candela Notification Appliances

UL, ULC, CSFM Listed; FM Approved; MEA (NYC) Acceptance\*

SmartSync Operation Audible/Visible Notification with Horn and Synchronized Flash, Non-Addressable

## **Features**

Audible/visible (A/V) notification appliances with efficient electronic horn and high output xenon strobe, available for wall or ceiling mount

- Operation is compatible with ADA requirements (refer to important installation information on page 3)
- Rugged, high impact, flame retardant thermoplastic housings are available in red or white with clear lens

## Operates over a two-wire SmartSync circuit to provide:

- Horns that are controlled separately from strobes on the same two-wire circuit
- "On-until-silenced" and "on-until-reset" operation on the same two-wire pair
- SmartSync horn activation of Temporal pattern, March Time pattern (at 60 BPM), or on continuously
- Strobe appliances on the same circuit operating at a synchronized 1 Hz flash rate
- Class B operation requires connection to a compatible SmartSync NAC or to SmartSync Control Module (SCM) 4905-9938
- Class A operation when connected to the 4905-9938
   SCM or with 4100U series fire alarm control panel NACs

#### Wall mount A/Vs features:

- Wiring terminals are accessible from the front of the housing providing easy access for installation, inspection, and testing
- Covers are available separately to convert housing color
- Available UL listed sound damper for locations requiring attenuation of 5 to 6 dBA (stairwells, small rooms, highly reverberant areas, etc.)

## Optional adapters and wire guards:

- Wall mount A/V adapters are available to cover surface mounted electrical boxes and to adapt to Simplex® 2975-9145 boxes
- UL listed red wire guards are available for wall or ceiling mount A/Vs

#### Visible notification appliance (strobe):

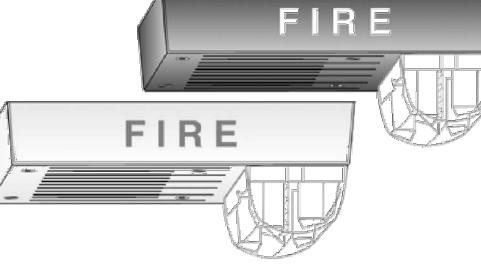
- 24 VDC xenon strobe; intensity is selectable as 15, 30, 75, or 110 candela with visible selection jumper secured behind strobe housing
- UL listed to Standard 1971
- Regulated circuit design ensures consistent flash output and provides controlled inrush current

## Audible notification appliance (horn):

- Low current, 24 VDC electronic horn with harmonically rich sound output suitable for either steady or coded operation (Temporal or 60 BPM March Time pattern)
- UL listed to Standard 464







Wall and Ceiling Mount A/Vs

### **Description**

Multi-Candela TrueAlert A/Vs with horn and synchronized strobe provide convenient installation to standard electrical boxes. The enclosure designs are both impact and vandal resistant and provide a convenient strobe intensity selection. Since each model can be selected for strobe intensity output, on-site model inventory is minimized and changes encountered during construction can be easily accommodated.

Wall mount A/V housings are a one-piece assembly (including lens) that mounts to a single or double gang, or 4" square standard electrical box. The cover can be quickly removed (a tool is required) and covers are available separately for color conversion.

**Ceiling mount** A/Vs install using standard 4" electrical boxes. Color choice is determined by model number.

## Strobe Intensity Selection

During installation, a selection plug at the back of the housing determines the desired strobe intensity. An attached flag with black letters on a highly visible yellow background allows the selected intensity to be seen at the side of the strobe lens.

\* This product has been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7125-0026:317 for allowable values and/or conditions concerning material presented in this document. Accepted for use – City of New York Department of Buildings – MEA35-93E. Refer to page 2 for listing status of wire guards. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products.

S4906-0002-6 11/2014

## Simplex

UL, ULC, CSFM Listed; FM Approved; MEA (NYC) Acceptance\*

## True Alert Notification Appliances

SmartSync Control Module and Strobe Synchronization Modules

## **Features**

Convert conventional Notification Appliance Circuits (NACs) into SmartSync circuits or synchronized strobe circuits:

- Simplex® SmartSync Control Modules combine separate horn and strobe NAC inputs into a 2-wire control that can silence horns while maintaining synchronized strobe operation
- Synchronized Flash Modules provide a 2-wire synchronized strobe output that also operates compatible 24 VDC conventional reverse polarity notification appliances

# SmartSync Control Module (SCM) provides two-wire control to separately activate horns and strobes:

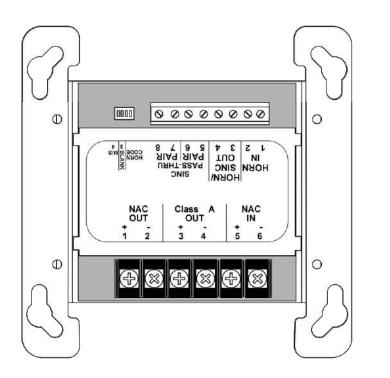
- Operation allows "on-until-silenced" and "on-until-reset" on the same two-wire pair while maintaining supervision continuity
- SmartSync horns sound as Temporal or March Time pattern, or continuous, controlled separately from strobes on the same circuit
- Strobes on the same circuit operate at a synchronized 1 Hz flash rate
- Output is either Class B or Class A

## **Conventional strobe synchronization models:**

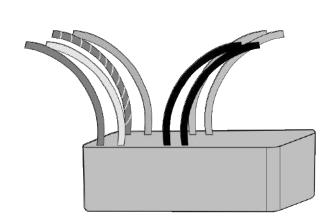
- Encapsulated package with color coded wire leads provides 1 Hz strobe synchronization and maintains supervision continuity
- Conventional horns and other DC appliances operate on the same 2-wire circuit
- Models are available with Class B or Class A output
- Small size allows convenient mounting

### **UL listed to Standard 1971**

\* These products have been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7125-0026:198 and 7125-0026:235 for allowable values and/or conditions concerning material presented in this document. Accepted for use – City of New York Department of Buildings – MEA35-93E. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products.



4905-9938 SmartSync Control Module (SCM), Shown Approximately 1/2 Size



4905-9922, Class A Synchronized Flash Module, Shown Approximately 1/2 Size

## SmartSync Control Module (SCM)

Model 4905-9938 SCM (SmartSync Control Module) converts two conventional NAC inputs into a SmartSync two-wire NAC output. One NAC can be programmed to operate as "on-until-silenced" and would be designated as the horn control (non-coded, on continuously during alarm). A second NAC would be programmed to provide "on-until-reset" operation and would be for the visible appliance (strobe) control (also non-coded, on continuously during alarm). Power is supplied by the strobe control NAC.

Selectable Horn output and Synchronized Strobes. In addition to operating the strobe and the horn independently, the SCM can be switch selected to operate the horns as temporal coded, march time coded (60 beats/minute), or on continuously. Strobes are activated with 1 Hz synchronized flashes.

\$4905-0003-4 11/2014

DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

AB

DATE:

PROJECT NO:

FIRE ALARM CUTSHEET SHEET 2 OF 2

SHEET NO:

DRAWING TITLE:

FA-3.02

#### FIRE PROTECTION NOTES:

FIRE PROTECTION SUPPLY PIPE: ROUTE THE BUILDING FIRE MAIN TO THE WATER MAIN AND CONNECT TO THE SUPPLY LINE AT THE APPROPRIATE TIME AND LOCATION. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF WATER MAIN PRIOR TO START OF CONSTRUCTION.

#### WORK INCLUDES BUT IS NOT LIMITED TO:

1. INSTALLING A COMPLETE WET SYSTEM DESIGNED THROUGHOUT THE BUILDING

#### **RELATED WORK SPECIFIED ELSEWHERE:**

1. WIRING OF FLOW ALARM SWITCHES AND TAMPER SWITCHES AND CONNECTION OF SWITCHES TO BUILDING ALARM SYSTEM ARE SPECIFIED IN ELECTRICAL DOCUMENTS.

#### SPRINKLER DESIGN REQUIREMENTS: (FOR LIGHT HAZARD):

- 2. THE CONTRACTOR SHALL SUBMIT 4 COMPLETE SETS OF SPRINKLER SHOP DRAWINGS AND HYDRAULIC CALCULATIONS TO THE ARCHITECT FOR REVIEW, PRIOR TO ORDERING MATERIAL AND/OR CUTTING PIPE. CONTRACTOR SHALL NOT CUT ANY PIPING UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND ACCEPTED. THE CONTRACTOR SHALL SHOW IN DASHED LINES THE LOCATION OF ALL DUCTWORK, LIGHTS AND DIFFUSERS.
- 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SPRINKLER PIPING AND HEADS LOCATIONS WITH OTHER TRADES. CONTRACTOR SHALL RELOCATE SPRINKLER PIPING AND HEADS AS NECESSARY IN ORDER TO AVOID CONFLICT WITH DUCTWORK, LIGHTS AND STRUCTURE
- 4. PROVIDE AUXILIARY DRAINS AT LOW POINTS IN SYSTEM AND FOR TRAPPED SECTIONS AS REQUIRED BY NFPA-13. LOCATE AUXILIARY DRAINS IN MECHANICAL CLOSETS OR OTHER LOCATIONS OUT OF SIGHT.
- 5. THE CONTRACTOR SHALL INCLUDE A TEN POUND (10 PSI) BUFFER IN THE HYDRAULIC CALCULATIONS, I.E. THE PRESSURE REQUIRED FOR THE SPRINKLER SYSTEM (INCLUDING HOSE STREAM) SHALL BE A MINIMUM OF 10 PSI LESS THAN THE AVAILABLE PRESSURE AT THE REQUIRED FLOW.
- 6. THE CONTRACTOR SHALL PERFORM A FLOW TEST PRIOR TO COMMENCING DESIGN AND SHALL PROVIDE TEST INFORMATION TO THE ARCHITECT FOR APPROVAL. SPRINKLER SYSTEM DESIGN SHALL BE BASED UPON THE CONTRACTOR'S FLOW TEST.

#### QUALITY CRITERIA:

#### PERMITS, LICENSES, INSPECTION FEES:

- 1. OBTAIN AND PAY FOR PERMITS, LICENSES AND INSPECTION FEES AS MAY BE REQUIRED FOR PERFORMANCE AND APPROVAL OF THE WORK PERFORMED UNDER THIS SECTION OF THE SPECIFICATIONS.
- 2. COMPLY WITH ALL REQUIREMENTS OF NFPA 13 AND THE STATE FIRE MARSHALL AND LOCAL CODES.

MATERIALS: MATERIALS SPECIFIED BY MANUFACTURER'S NAME SHALL BE USED UNLESS PRIOR APPROVAL OF A SUBSTITUTE IS GIVEN BY ADDENDA.

#### SUBMITTALS:

BEFORE MATERIALS AND EQUIPMENT ARE PURCHASED, SUBMIT FOR ARCHITECT'S APPROVAL, A COMPLETE SCHEDULE OF MATERIALS AND EQUIPMENT TO BE INCORPORATED IN THE WORK. SUBMITTALS SHALL INCLUDE THE FOLLOWING:

- 1. COMPLETE SHOP DRAWINGS WITH HYDRAULIC CALCULATIONS
- 2. ALL VALVES
- 3. DRY PIPE VALVE AND ACCESSORIES
  4. SPRINKLER HEADS
- 5. TAMPER SWITCHES
- 6. PIPE HANGERS AND SUPPORTS7. PIPE AND FITTINGS
- 7. PIPE AND FITTING 8. CABINETS
- 9. AIR COMPRESSOR
- 10. ALARM VALVE

GROOVED JOINT COUPLINGS AND FITTINGS SHALL BE SHOWN ON DRAWINGS AND PRODUCT SUBMITTALS, AND BE SPECIFICALLY IDENTIFIED WITH THE APPLICABLE STYLE NUMBER.

SPRINKLER HEADS SHALL BE REFERRED TO ON DRAWINGS, SUBMITTALS AND OTHER DOCUMENTATION, BY THE SPRINKLER IDENTIFICATION OR MODEL NUMBER AS SPECIFICALLY PUBLISHED IN THE APPROPRIATE AGENCY LISTING OR APPROVAL. TRADE NAMES OR OTHER ABBREVIATED DESIGNATIONS SHALL NOT BE ALLOWED.

#### TESTING PIPE SYSTEMS:

TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE ARCHITECT OR HIS DESIGNATED REPRESENTATIVE. EQUIPMENT, MATERIALS, AND INSTRUMENTS FOR TESTING SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.

AUTOMATIC SPRINKLER PIPING: THE AUTOMATIC SPRINKLER SYSTEMS SHALL BE HYDROSTATICALLY TESTED IN THEIR ENTIRETY OR IN ZONES DEFINED BY SHUT-OFF VALVES. THE PIPING SHALL BE TESTED AT A PRESSURE OF 200 PSIG, MEASURED AT THE LOW POINT IN THE SYSTEM OR ZONE, AND SHALL BE PROVED TIGHT AT THIS PRESSURE FOR A PERIOD OF NOT LESS THAN TWO HOURS. LEAKS DETECTED SHALL BE REPAIRED BY TIGHTENING, REWELDING JOINTS, OR REPLACING DAMAGED PIPE OR FITTINGS. CAULKING OF JOINTS WILL NOT BE PERMITTED.

DRY PIPE AIR TEST: ALL DRY PIPE PIPING SHALL BE TESTED AT 40 PSIG AND ALLOWED TO STAND FOR 24 HOURS. ALL LEAKS WHICH ALLOW A LOSS OF PRESSURE OVER 1½ PSI SHALL BE REPAIRED.

COMPRESSED AIR SYSTEM: ALL PIPING SHALL BE PNEUMATICALLY TESTED AT A PRESSURE OF 150 PSIG FOR A PERIOD OF NOT LESS THAN 2 HOURS. NO LOSS IN PRESSURE WILL BE PERMITTED. LEAKS DETECTED SHALL BE REPAIRED BY TIGHTENING OR REPLACING PIPE AND FITTINGS. CAULKING OF JOINTS WILL NOT BE PERMITTED.

#### OPERATION AND MAINTENANCE INSTRUCTIONS:

OPERATING AND MAINTENANCE INSTRUCTIONS, PRINTED AND BOUND IN HARD COVER THREE RING LOOSE LEAF NOTEBOOKS, SHALL BE PROVIDED FOR EACH ITEM OF EQUIPMENT LISTED BELOW; 5 SEPARATE COPIES SHALL BE PROVIDED. EACH NOTEBOOK SHALL BE PROVIDED WITHIN AN IDENTIFYING LABEL UNDER A CLEAR PLASTIC COVER SHIELD ON THE FRONT COVER WHICH SHALL IDENTIFY THE PROJECT, ENGINEER, CONTRACTOR AND DATE.

- 1. NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET NO. 25. PHOTO COPIES ARE NOT ACCEPTABLE.
- 2. COPIES OF ALL APPROVED SUBMITTAL DATA (LISTED ABOVE UNDER SUBMITTALS).
  3. AS-BUILT COPIES OF DESIGN DRAWINGS AND HYDRAULIC CALCULATIONS.

#### SEISMIC REQUIREMENTS:

PROVIDE SEISMIC PROTECTION FOR THE SPRINKLER SYSTEM. DESIGN AND INSTALL SEISMIC PROTECTION IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 SECTION TITLED "PROTECTION OF PIPING AGAINST DAMAGE WHERE SUBJECT TO EARTHQUAKES." SEISMIC REQUIREMENTS MAY BE WAIVED BY THE AUTHORITY HAVING JURISDICTION. PROVIDE WRITTEN DOCUMENTATION OF WAIVER.

#### GUARANTEE:

ALL EQUIPMENT SHALL BE GUARANTEED AS SPECIFIED UNDER THE GENERAL AND SPECIAL CONDITIONS. GUARANTEE ON ALL EQUIPMENT SHALL START AND COINCIDE WITH THE CONTRACTOR'S GUARANTEE OBLIGATIONS.

#### PIPE AND FITTINGS:

PIPE AND FITTINGS LISTED HEREIN SHALL BE FOR THE SERVICES INDICATED.

#### SPRINKLER AND STANDPIPE:

#### JOINTS:

#### MECHANICAL GROOVED JOINT COUPLINGS SHALL BE LISTED FOR USE IN FIRE PROTECTION SYSTEMS.

- 1. GROOVED END FITTINGS: FITTINGS SHALL BE DUCTILE IRON (ASTM A536); FORGED STEEL (ASTM A234); OR FABRICATED FROM CARBON STEEL PIPE (ASTM A53); WITH PRE-GROOVED ENDS FOR USE WITH MECHANICAL COUPLINGS OF THE SAME MANUFACTURER
- 2. MECHANICAL COUPLINGS: COUPLING HOUSINGS SHALL BE DUCTILE IRON (ASTM A536). BOLTS AND NUTS SHALL BE CARBON STEEL TRACK-TYPE (ASTM A183), MINIMUM TENSILE 110,000 PSI. GASKETS SHALL BE GRADE "E" EPDM, FOR WATER SERVICES FROM -30 TO +230EF. AT JOINTS ALLOWING CONTROLLED MOVEMENT, EXPANSION, CONTRACTION OF DEFLECTION, FLEXIBLE COUPLINGS WITH SHALL BE USED. AT ALL JOINTS NOT REQUIRING FLEXIBILITY, A RIGID COUPLING SHALL BE USED.
- a. RIGID TYPE: COUPLING HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN BOLT PADS SHALL BE USED TO PROVIDE SYSTEM RIGIDITY AND SUPPORT AND HANGING IN ACCORDANCE WITH NFPA 13.
- b. FLEXIBLE TYPE: USE IN LOCATIONS WHERE VIBRATION ATTENUATION AND STRESS RELIEF ARE REQUIRED.

  3. FLANGE ADAPTER: FLAT FACE, FOR DIRECT CONNECTION TO ANSI CLASS 125 OR 150 FLANGED COMPONENTS

#### UNDERGROUND PIPE:

 STANDARD WEIGHT DUCTILE IRON PIPE WITH MECHANICAL "BOLTED TYPE" JOINTS.
 PROVIDE TIE RODS AND THRUST BLOCKS AT EACH CHANGE OF DIRECTION OF THE UNDERGROUND FIRE SERVICE PIPING. INSTALL TIE RODS AND THRUST BLOCKS IN ACCORDANCE WITH NFPA-24 REQUIREMENTS.

#### FIRE DEPARTMENT VALVES:

#### VALVES:

- 1. VALVES OF THE SAME TYPE SHALL HAVE THE NAME OR TRADEMARK OF THE MANUFACTURERS AND THE WORKING PRESSURE STAMPED OR CAST ON THE VALVE BODY.
- 2. ALL VALVES INSTALLED IN HORIZONTAL LINES SHALL BE INSTALLED WITH THE STEMS HORIZONTAL OR ABOVE. VALVE HANDWHEELS SHALL BE ORIENTED, WHEN INSTALLED, TO PROVIDE MAXIMUM ACCESSIBILITY FOR OPERATION.
- HANDWHEELS SHALL BE ORIENTED, WHEN INSTALLED, TO PROVIDE MAXIMUM ACCESSIBILITY FOR OPERATION.

  3. ALL VALVES REQUIRING PACKING SHALL BE DESIGNED AND CONSTRUCTED SUCH THAT THEY CAN BE REPACKED UNDER
- PRESSURE.

  4. VALVE HANDWHEELS SHALL BE MALLEABLE IRON.
- 5. FIRE DEPARTMENT VALVES: FIRE DEPARTMENT ANGLE VALVES SHALL BE 2½" SIZE PRESSURE REDUCING TYPE COMPLETE WITH CAP AND CHAIN. VALVES SHALL HAVE POLISHED BRASS FINISH AND SHALL BE ELKHART UP-25, POTTER-ROEMER 4085 OR EQUIVALENT BY NIBCO OR SIERRA.

#### SPRINKLER HEADS:

SPRINKLER HEADS SHALL BE GLASS-BULB TYPE. BODY SHALL BE DIE CAST BRASS, WITH HEX-SHAPED WRENCH BOSS CAST INTO THE BODY TO FACILITATE INSTALLATION AND REDUCE THE RISK OF DAMAGE DURING INSTALLATION.

#### SPRINKLER HEAD TYPES SHALL BE COORDINATED WITH THE ARCHITECT.

UPRIGHT SPRINKLER HEADS SHALL BE ½ INCH SPRAY TYPE WITH BRONZE FINISH. SPRINKLERS SHALL BE VIKING, CENTRAL SPRINKLER, RELIABLE, GRINNELL OR AUTOMATIC SPRINKLER.

#### CFC 2022 - 8.3.5 Thread Size Limitations:

Sprinklers having a K-factor exceeding K-5.6 (80) and having 1/2 in. (15 mm) National Pipe Thread (NPT) shall not be installed in new sprinkler systems.

PENDENT SPRINKLER HEADS UNLESS OTHERWISE INDICATED PENDENT SPRINKLER HEADS SHALL BE QUICK RESPONSE ½ INCH SPRAY TYPE WITH CHROME PLATED FINISH AND WHITE ESCUTCHEON PLATE. SPRINKLERS SHALL BE VIKING, CENTRAL SPRINKLER, RELIABLE, GRINNELL OR AUTOMATIC SPRINKLER.

SIDEWALL SPRINKLER HEADS SHALL BE QUICK RESPONSE ½ SPRAY TYPE WITH CHROME PLATED FINISH AND WHITE ESCUTCHEON. SPRINKLERS SHALL BE VIKING, CENTRAL SPRINKLER, RELIABLE, GRINNELL OR AUTOMATIC SPRINKLER.

CONCEALED PENDENT SPRINKLER HEADS SHALL BE ½ INCH SPRAY TYPE WITH CHROME PLATED FINISH AND WHITE ESCUTCHEON AND CEILING PLAT. SPRINKLERS SHALL BE VIKING, CENTRAL SPRINKLER, RELIABLE, GRINNELL OR AUTOMATIC SPRINKLER.

#### HANGERS:

HANGERS FOR FIRE PROTECTION PIPING:

HANGER FOR 4" AND LARGER HORIZONTAL LINES SHALL BE CLEVIS TYPE HANGERS, B-LINE B-3100 OR EQUIVALENT BY ANVIL, OR ERICO.

HANGER FOR HORIZONTAL LINES UP TO 3½" SHALL BE BAND TYPE HANGERS, B-LINE MODEL B-3172 OR EQUIVALENT BY ANVIL, OR ERICO.

SUPPORTS FOR VERTICAL LINES PASSING THROUGH FLOOR SHALL BE RISER CLAMP TYPE, FEE & MASON FIG. NO. 241, CARPENTER AND PATTERSON NO. 126 OR EQUIVALENT BY B-LINE, ANVIL OR ERICO.

## GENERAL:

UNLESS SPECIFICALLY STATED OTHERWISE, THE FIRE PROTECTION SYSTEM SHALL CONFORM TO ALL OTHER SECTIONS OF THIS SPECIFICATION WHICH APPLY TO PIPE INSTALLATION, ACCESSORIES AND CONTROLS.

ALL THREADED HOSE OUTLETS SHALL COMPLY WITH THE LOCAL FIRE DEPARTMENT REQUIREMENTS.

ALL SHOP DRAWINGS SUBMITTED ON ITEMS REQUIRING UNDERWRITERS' LISTING SHALL BEAR EVIDENCE OF UNDERWRITERS' APPROVAL.

ALL EXPOSED FIRE SYSTEM PIPING INCLUDING VALVE ROOM PIPING SHALL BE CLEANED OF RUST, GREASE AND SCALED AND SHALL BE PROVIDED WITH A FIELD APPLIED PRIME COAT AND TWO COATS OF AN OIL BASED ENAMEL PAINT. COLOR SHALL BE RED OR AS DIRECTED BY ARCHITECT.

THE CONTRACTOR SHALL PERFORM ALL TESTS OF FIRE PROTECTION SYSTEMS AS REQUIRED BY GOVERNING CODES AND LOCAL AUTHORITIES AT NO ADDITIONAL COST TO THE OWNER. TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE OWNERS REPRESENTATIVE.

#### INSTALLATION:

INSTALL SPRINKLER PIPING WITH A SLOPE TO VALVE ROOM AND TO AUXILIARY LOW POINT DRAINS AS REQUIRED BY NFPA 13.

COORDINATE SPRINKLER INSTALLATION WITH BUILDING STRUCTURE AND OTHER TRADES.

ROUTE [DRY PIPE] [ALARM] VALVE DRAINS TO [OUTSIDE BUILDING] [FLOOR DRAIN] AND TERMINATE 9" AFG.

VERIFY LOCATIONS OF LIGHTS AND DIFFUSERS PRIOR TO INSTALLING SPRINKLER HEADS AND PIPING.

SPRINKLER HEADS SHALL BE INSTALLED ON CENTERLINE WITH LIGHTS, DIFFUSERS AND DOORS, IN LIVING UNITS. CEILING THE SPRINKLER HEADS SHALL BE INSTALLED IN THE CENTER OF 2' X 2' TILES AND IN THE CENTER OF THE ½ TILE IN 2' X 4' TILES.

CONTRACTOR SHALL PURGE AIR FROM ALL WET PIPE SPRINKLER SYSTEM PIPING PRIOR TO FINAL SYSTEM COMPLETION.

INSTALL A SPARE SPRINKLER CABINET NEAR THE SPRINKLER RISER. PROVIDE NUMBER OF SPARE SPRINKLERS AS REQUIRED BY NFPA-13, WITH AT LEAST ONE SPARE FOR EACH TYPE OF HEAD INSTALLED.

THESE SHEETS ARE NOT APPROVED FOR THE INSTALLATION ANY UNDERGROUND FIRE PROTECTION SYSTEM PIPING. A SEPERATE SUBMITTAL TO THE CITY OF ARACADERO FIRE DEPARTMENT FOR REVIEW AND AAPROVAL IS REQUIRED BY THE INSTALLING C-16 LISCENSED FIRE PROTECTION CONTRACTOR PRIOR TO ANY DEMOLITION, MODIFICATION OR INSTALLATION OF ANY FIRE PROTECTION COMPONENTS. AS PER 2022 CFC 105.4, 105.7, 901.3, CH.80,2016 NFPA 14 & CBC 107.2.1

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DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

M J

DATE:

PROJECT NO:

03/2023

FIRE PROTECTION GENERAL NOTES.

DRAWING TITLE:

SHEET NO:

F 0.0

## 2022 CALIFORNIA FIRE CODE - TITLE 24, PART 9 with July Supplement;

#### **SECTION 703: PENETRATIONS**

MATERIALS AND FIRE STOP SYSTEMS USED TO PROTECT MEMBRANE AND THROUGH PENETRATIONS IN FIRE-RESISTANCE-RATED CONSTRUCTION AND CONSTRUCTION INSTALLED TO RESIST THE PASSAGE OF SMOKE SHALL BE MAINTAINED. THE MATERIALS AND FIRESTOP SYSTEMS SHALL BE SECURELY ATTACHED TO OR BONDED TO THE CONSTRUCTION BEING PENETRATED WITH NO OPENINGS VISIBLE THROUGH OR INTO THE CAVITY OF THE CONSTRUCTION. WHERE THE SYSTEM DESIGN NUMBER IS KNOWN, THE SYSTEM SHALL BE INSPECTED TO THE LISTING CRITERIA AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

#### CHAPTER 23: MOTOR-FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

#### SECTION 2301: GENERAL - SCOPE

AUTOMOTIVE MOTOR-FUEL-DISPENSING FACILITIES, MARINE MOTOR FUEL-DISPENSING FACILITIES, FLEET VEHICLE MOTOR FUEL-DISPENSING FACILITIES AIRCRAFT MOTOR VEHICLE FUEL-DISPENSING FACILITIES AND REPAIR GARAGES SHALL BE IN ACCORDANCE WITH THIS CHAPTER AND THE CALIFORNIA BUILDING CODE, INTERNATIONAL FUEL GAS CODE AND CALIFORNIA MECHANICAL CODE, SUCH OPERATIONS SHALL INCLUDE BOTH THOSE THAT ARE OPEN TO THE PUBLIC AND PRIVATE OPERATIONS.

#### **SECTION 2305: OPERATIONAL REQUIREMENTS**

#### 2305.2.4. EMERGENCY SHUTOFF VALVES.

AUTOMATIC EMERGENCY SHUTOFF VALVES REQUIRED BY SECTION 2306.7.4 SHALL BE CHECKED NOT LESS THAN ONCE PER YEAR BY MANUALLY TRIPPING THE HOLD-OPEN LINKAGE.

#### 2305.5 FIRE EXTINGUISHERS

APPROVED PORTABLE FIRE EXTINGUISHERS COMPLYING WITH SECTION 906 WITH A MINIMUM RATING OF 2-A:20-B:C SHALL BE PROVIDED AND LOCATED SUCH THAT AN EXTINGUISHER IS NOT MORE THAN 75 FEET (22,860 mm) FROM PUMPS, DISPENSERS OR STORAGE TANK FILL-PIPE OPENINGS.

#### 2305.6 WARNING SIGNS.

WARNING SIGN SHALL BE CONSPICUOUSLY POSTED WITHIN SIGHT OF EACH DISPENSER IN THE FUEL-DISPENSING AREA AND SHALL STATE THE FOLLOWING:

- 1. NO SMOKING
- 2. SHUT OFF MOTO
- 3. DISCHARGE YOUR STATIC ELECTRICITY BEFORE FUELING BY TOUCHING A METAL SURFACE AWAY FROM THE NOZZLE
- 4. TO PREVENT STATIC CHARGE, DO NOT REENTER YOUR VEHICLE WHILE GASOLINE IS PUMPING
- 5. IF A FIRE STARTS, DO NOT REMOVE NOZZLE-BACK AWAY IMMEDIATELY.
- 6. IT IS UNLAWFUL AND DANGEROUS TO DISPENSE GASOLINE INTO UNAPPROVED CONTAINERS
- 7. NO FILLING OF PORTABLE CONTAINERS IN OR ON A MOTOR VEHICLE. PLACE CONTAINER ON GROUND BEFORE FILLING.

## NFPA 13: STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS - 2022 ANNEX A: EXPLANATORY MATERIAL

MATERIALS AND FIRE STOP SYSTEMS USED TO PROTECT MEMBRANE AND THROUGH PENETRATIONS IN FIRE-RESISTANCE-RATED CONSTRUCTION AND CONSTRUCTION INSTALLED TO RESIST THE PASSAGE OF SMOKE SHALL BE MAINTAINED. THE MATERIALS AND FIRESTOP SYSTEMS SHALL BE SECURELY ATTACHED TO OR BONDED TO THE CONSTRUCTION BEING PENETRATED WITH NO OPENINGS VISIBLE THROUGH OR INTO THE CAVITY OF THE CONSTRUCTION. WHERE THE SYSTEM DESIGN NUMBER IS KNOWN, THE SYSTEM SHALL BE INSPECTED TO THE LISTING CRITERIA AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

### PIPE SCHEDULE SIZING METHOD:

STEEL LIGHT HAZARD PIPE SCHEDULE					
PIPE SIZE	SPRINKLER HEADS				
1" (25mm)	2 SPRINKLERS				
1-1/4" (32mm)	3 SPRINKLERS				
1-1/2" (40mm)	5 SPRINKLERS				
2" (50mm)	10 SPRINKLERS				
2-1/2" (65mm)	30 SPRINKLERS				
3" (80mm)	60 SPRINKLERS				
3-1/2"(90mm)	100 SPRINKLERS				
NFPA 13 TABLE 27	7.5.2.2.1 LIGHT HAZARD PIPE SCHEDULE				

## \*HYDRAULIC CALCULATION HAS BEEN DONE FOR ALL PROJECTS WHICH SUPERSEDE THE ABOVE PIPE SCHEDULE.

\*MAXIMUM VELOCITY WAS LIMITED TO 20 FT/SECONDS.
HOWEVER, NFPA 13 DOES NOT LIMIT THE VELOCITY WHEN USING
HYDRAULIC CALCULATION METHOD.

PIPE SIZE	SPRINKLER HEADS
1" (25mm)	2 SPRINKLERS
1-1/4" (32mm)	3 SPRINKLERS
1-1/2" (40mm)	5 SPRINKLERS
2" (50mm)	10 SPRINKLERS
2-1/2" (65mm)	20 SPRINKLERS
3" (80mm)	40 SPRINKLERS
3-1/2"(90mm)	65 SPRINKLERS
4" (100mm)	100 SPRINKLERS
5" (125mm)	160 SPRINKLERS
6" (150mm)	275 SPRINKLERS

## \*HYDRAULIC CALCULATION HAS BEEN DONE FOR ALL PROJECTS WHICH SUPERSEDE THE ABOVE PIPE SCHEDULE.

\*MAXIMUM VELOCITY WAS LIMITED TO 20 FT/SECONDS.
HOWEVER, NFPA 13 DOES NOT LIMIT THE VELOCITY WHEN USING HYDRAULIC CALCULATION METHOD.

#### CHAPTER 23: MOTOR-FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

#### SECTION 2301: GENERAL - SCOPE

#### A.4.3.2:

LIGHT HAZARD OCCUPANCIES INCLUDE OCCUPANCIES HAVING USES AND CONDIDTIONS SIMILAR TO THE FOLLOWING:

#### (12) OFFICES, INCLUDING DATA PROCESSING

A.4.3.3:

ORDINARY HAZARD (GROUP 2) OCCUPANCIES INCLUDE OCCUPANCIES HAVING USES AND CONDITIONS SIMILAR TO THE FOLLOWING:

#### (15) MERCANTILE

#### A.4.3.6:

EXTRA HAZARD (GROUP 2) OCCUPANCIES INCLUDE OCCUPANCIES HAVING USES AND CONDITIONS SIMILAR TO THE FOLLOWING:

(9) CAR STACKERS AND CAR LIFT SYSTEMS WITH 2 CARS STACKED VERTICALLY

### **CHAPTER 19: DESIGN APPOACHES**

#### 19.2.6 HOSE ALLOWANCE

WHEN HOSE VALVES FOR FIRE DEPARTMENT USE ARE ATTACHED TO WET PIPE SPRINKLER SYSTEM RISERS IN ACCORDANCE WITH 16.15.2, THE FOLLOWING SHALL APPLY:

- (1) THE SPRINKLER SYSTEM DEMAND SHALL NOT BE REQUIRED TO BE ADDED TO STANDPIPE DEMAND AS DETERMINED FROM NFPA 14
- (2) WHERE THE COMBINED SPRINKLER SYSTEM DEMAND AND HOSE STREAM ALLOWANCE OF TABKE 19.3.3.1.2 EXCEEDS THE REQUIREMENTS OF NFPA 14, THIS HIGHER DEMAND SHALL BE USED.
- (3) FOR PARTIALLY SPRINKLERED BUILDINGS, THE SPRINKLER DEMAND, NOT ICLUDING HOSE STREAM ALLOWANCE, AS INDICATED IN FIGURE 19.3.3.1.1 SHALL BE ADDED TO THE REQUIREMENTS GICEN IN NFPA 14.

#### 19.3 OCCUPANCY HAZARD FIRE CONTROL APPROACH FOR SPRAY SPRINKLERS

#### 19.3.1 GENERAL:

THE WATER DEMAND REQUIREMENTS SHALL BE DETERMINED BY EITHER THE PIPE SCHEDULE METHOD IN ACCORDANCE WITH 19.3.2 OR THE HYDRAULIC CALCULATION METHOD IN ACCORDANCE WITH 19.3.3

#### 19.3.1.24 CLASSIFICATIONS SHALL BE AS FOLLOWS:

- (1) LIGHT HAZARD
- (2) ORDINARY HAZARD (GROUP 1 AND 2)
- (3) EXTRA HAZARD (GROUP 1 AND 2)
- (4) SPECIAL OCCUPANCY HAZARD (SEE CHAPTER 26)

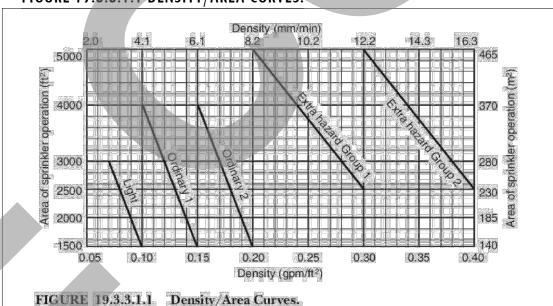
## 19.3.3 WATER DEMAND REQUIREMENTS - HYDRAULIC CALCULATION METHODS.

#### 19.3.3.1 GENERAL:

THE WATER DEMAND FOR SPRINKLERS SHALL BE DETERMINED ONLY FROM ONE OF THE FOLLOWING, AT THE DISCRETION OF THE DESIGNER:

- (1) DENSITY/AREA CURVES OF FIGURE 19.3.3.1.1 IN ACCORDANCE WITH THE DENSITY/AREA METHOD OD 19.3.3.2.
- (2) THE ROOM THAT CREATES THE GREATEST DEMAND IN ACCORDANCE WITH THE ROOM DESIGN METHOD OF 19.3.3.4
- (3) SPECIAL DESIGN AREAS IN ACCORDANCE WITH 19.3.3.4

### FIGURE 19.3.3.1.1 DENSITY/AREA CURVES:



## 19.3,3.2 DENSITY/AREA METHOD

#### 19.3.3.2.1 WATER SUPPLY:

198.1.32.1.1: THE WTAER SUPPLY REQUIREMENT FOR SPRINKLERS ONLY SHALL BE CALUCLATED FROM THE DENSITY/AREA CURVES OF FIGUIRE 19.3.3.1.1 OF FROM CHAPTER 26 WHERE DENSITY/AREA CRITERIA ARE SPECIFIED FOR SPECIAL OCCUPANCY HAZARDS.

#### 302.1 Occupancy Classification:

Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups listed in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with Section 508. Where a structure is proposed for a purpose that is not specifically listed in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with

## Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5. Business (see Section 304): Group B.

[SFM] Organized Camps (see Section 450): Group C. Educational (see Section 305): Group E.

Factory and Industrial (see Section 305): Group E.

Factory and Industrial (see Section 306): Groups F-1 and F-2.

High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.

Institutional (see Section 308): Groups I-2, I-2.1, I-3 and I-4.
[SFM] Laboratory (see Section 202): Group B, unless classified as Group L (see Section 453)

or Group H (see Section 307).

[SFM] Laboratory Suites (see Section 453): Group L.

Mercantile (see Section 309): Group M.

Residential (see Section 310): Groups R-1, R-2, R-2.1, R-3, R-3.1 and R-4.

Storage (see Section 311): Groups S-1 and S-2.
Utility and Miscellaneous (see Section 312): Group U.

[SFM] Existing buildings housing existing protective social care homes or facilities established prior to 1972 (see California Fire Code Chapter 11 and California Existing Building Code).

#### 5703.6.2Design and fabrication of piping systems and components:

Piping system components shall be designed and fabricated in accordance with the applicable standard listed in Table 5703.6.2 and Chapter 27 of NFPA 30, except as modified by Section 5703.6.2.1 and 5703.6.2.2.

PIPING USE	STANDARD
POWER PIPING	ASME B31.1
PROCESS PIPING	ASME B31.3
PIPIELINE TRANSPORTATION SYSTEM FOR LIQUID HYDROCABONS AND OTHER LIQUIDS.	ASME B31.4
BUILDING SERVICE PIPING	ASME B31.9

#### 5003.2.2Piping, tubing, valves and fittings:

Piping, tubing, valves, and fittings conveying hazardous materials shall be designed and installed in accordance with ASME B31 or other approved standards, and shall be in accordance with Sections 5003.2.2.1 and 5003.2.2.2.

#### 5003.2.2.1Design and construction:

Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

durability to withstand the pressure, structural and seismic stress and exposure to which they are

- 1.Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and
- subject.

  2.Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material
- conveyed.

  3.Manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on
- 3.Manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed or supply piping and tubing and provided with ready access at the following locations:
- 3.1.The point of use.3.2.The tank, cylinder or bulk source.
- 4.Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be identified and the location shall have access clearly visible and indicated by means of a sign.

  5.Backflow prevention or check valves shall be provided where the backflow of hazardous materials

could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

- Exceptions:1.Piping for inlet connections designed to prevent backflow.
- 2. Piping for pressure relief devices.

#### 9.1 Hangers

## 9.1.1.1

Unless the requirements of 9.1.1.2 are met, types of hangers shall be in accordance with the requirements of Section 9.1.

## 9.1.1.2 Hangers certified by a registered professional engineer to in

Hangers certified by a registered professional engineer to include all of the following shall be an acceptable alternative to the requirements of Section 9.1:

Hangers shall be designed to support five times the weight of the water-filled pipe plus 250 lb (115 kg) at each point of piping support.

These points of support shall be adequate to support the system.

The spacing between hangers shall not exceed the value given for the type of pipe as indicated in Table 9.2.2.1(a) or Table 9.2.2.1(b).

Hanger components shall be ferrous.

Detailed calculations shall be submitted, when required by the reviewing authority, showing stresses developed in hangers, piping, and fittings, and safety factors allowed.

The maximum distance between hangers shall not exceed that specified in Table 9.2.2.1(a) or Table 9.2.2.1(b), except where the provisions of 9.2.4 apply.

Table 9.2.2.1(a) Maximum Distance Between Hangers (ft-in.)

		NOMINAL PIPE SIZE (in.)										
Table 9.2.2.1(a)	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4	5	6	8
STEEL PIPE EXCEPT THREADED LIGHWALL	NA	12-0	12-0	15-0	15-0	15-0	15-0	15-0	15-0	15-0	15-0	15-0
THREADED LIGHTWALL STEEL PIPE	NA	12-0	12-0	12-0	12-0	12-0	12-0	NA	NA	NA	NA	NA
COPPER TUBE	8-0	8-0	10-0	10-0	12-0	12-0	12-0	15-0	15-0	15-0	15-0	15-0
CPVC	5-6	6-0	6-6	7-0	8-0	9-0	10-0	NA	NA	NA	NA	NA
DUCTILE-IRON PIPE	NA	NA	NA	NA	NA	NA	15-0	NA	15-0	NA	15-0	15-0

NA: NOT APPLICABLE

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SITE ADDRESS:

DESIGNED BY:	
CHECKED BY:	
DRAWN BY:	MJ
DATE:	PROJECT NO:
03/2023	

FIRE PROTECTION
CODE NOTES AND
ANALYSIS.

SHEET NO:

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#### **GENERAL NOTES**

- SYSTEM DESIGN AND INSTALLATION SHALL COMPLY NFDA 13 2022 AND LOCAL APPLICABLE
- SYSTEM DESIGN BASIS: HYDRAULICALLY MOST DEMANDING 2 SPRINKLERS.

3. WATER SUPPLY: HYDRANT FLOW TEST: 150 GPM

> SYSTEM DEMAND: REQUIRED PRESSURE: 33.64 PSI TOTAL FLOW REQUIRED: 45.26 GPM

- SAFETY MARGIN UNDER ALL PIPE SHALL BE U.D.N. UNDERGROUND - IPS POLLY PIPE RISER - CPVC OVERHEAD -
- MANUFACTURERS OF RESIDENTIAL SPRINKLERS PUBLISH INFORMATION REGARDING THE SPACING OF THEIR SPRINKLERS WITH RESPECT TO HEAT PROUCING DEVICES (FIRE PLACES, RANGES, OVES, HEATING, VENTS, WATER HEATERS, FURNACES, ETC.) WHETHER OR NOT ALL HEAT PRODUCING DEVICES ARE SHOWN ON THE PLAN PROPER MINIMUM DISTANCES MUST BE
- MAINTAINED. THE MINIMUM DISTANCE BETWEEN ANY 2 RESIDENTIAL SPRINKLERS ON THIS PRODUCT IS HYDRAULICALLY LIMITED TO 12 FEET. SPRIRNKLERS SHALL NT EXCEED 6 FEET FROM ANY
- THE INIMUM DISTANCE A SPRINKLER CAN BE LOCATED FROM A WALL IS 4 INCHES. 9. PENDANT SPRINKLERS SHALL E A MINIMUM OF 36 FEET WAY FROM THE CENTER OF ANY
- OBSTRUCTIONS SUCH AS CEILING FANS AND LIGHT FIXTURES UNLESS THE REQUIREMENTS OF 10. INSTALLATION OF ALL RESIDENTIAL SPRINKLERS SHALL BE IN STRICT COMPLIANCE WITH THE
- MANUFACTURERS INSTALLATION GUIDE. 11. PRIOR TO DRILLINGJOISTS, CONTACT STRUCTURAL ENGINEER FOR RECOMMENDED DRILLING

GUIDELINES.

HANGER SPACING							
PIPE MATERIAL	3/4"	1"	1-1/4"	1-1/2"	2"	2 1/2"	3"
COPPER	8	8	10	10	12	12	12
CPVC	5.5	6	6.5	7	8	9	10
SCHEDULE 40 &10 STEEL	•	12	12	15	15	15	15
MIIDDAD ADI D							

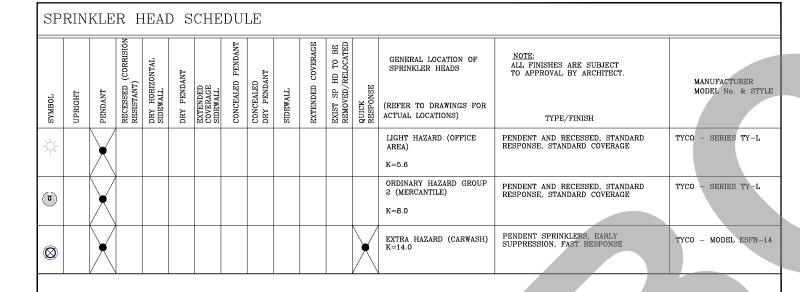
HANGER NOTES

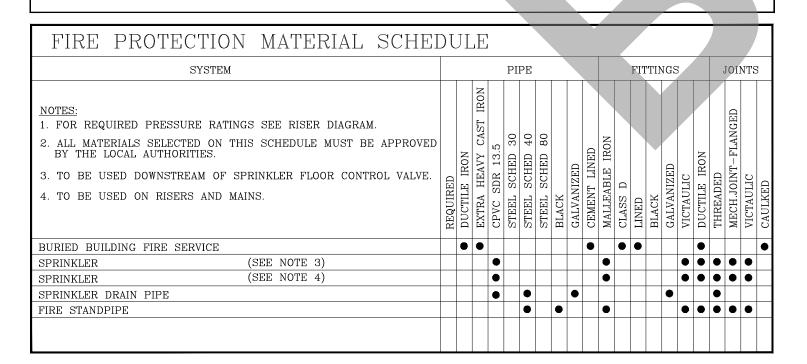
1. ALL LIGHTING SHOWN ARE THE MAXIMUM RECOMMENDED DISTANCE BETWEEN HANGERS EXPRESSED. 2. PROVIDE A HANGER ITHIN 6 INCHES OF

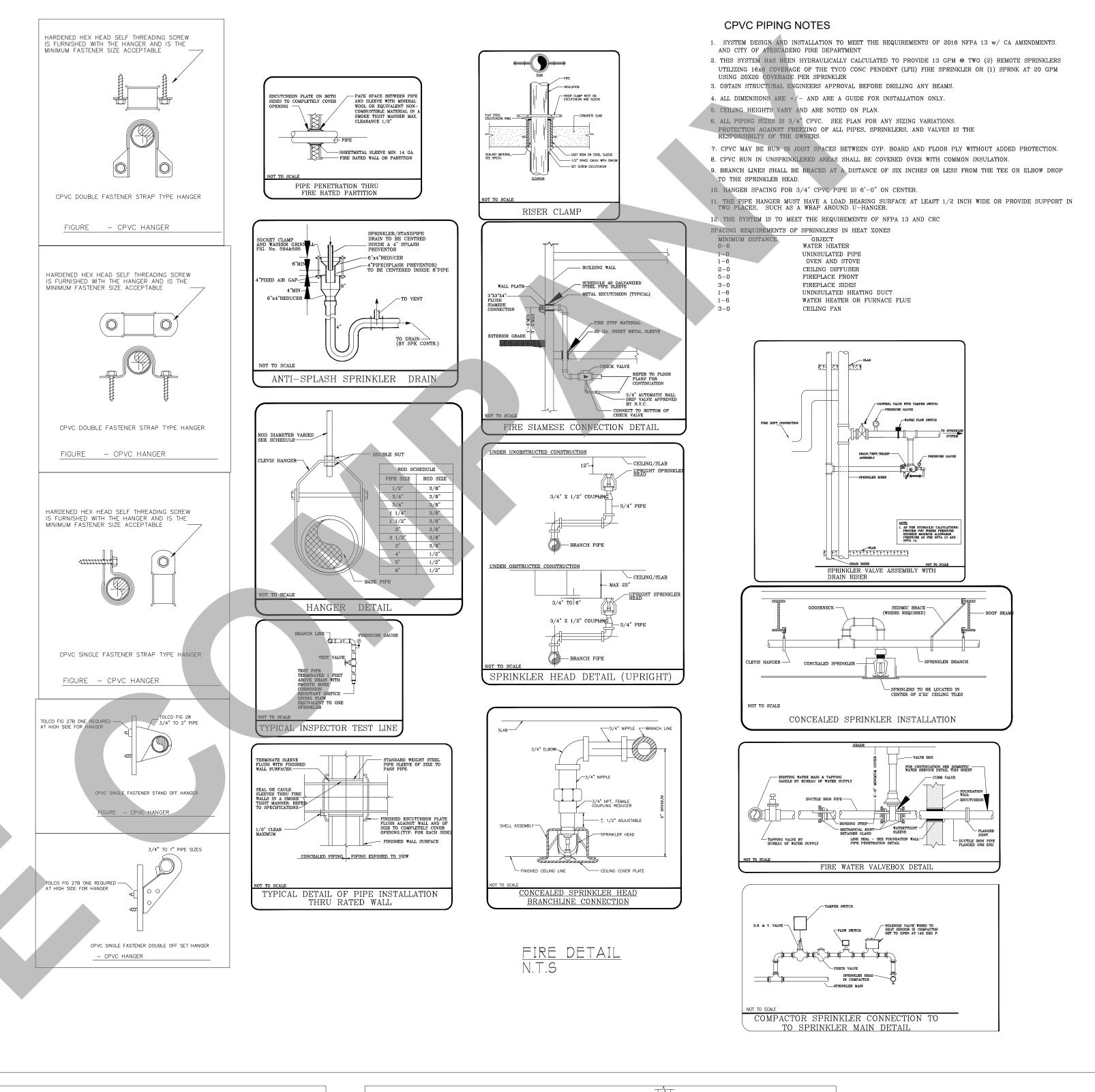
ALL DROPS TO SPRINKLER HEADS WHEN

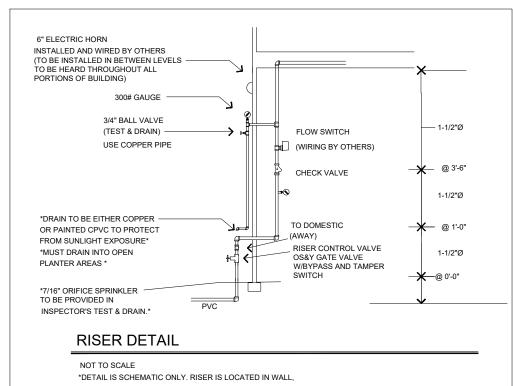
USING CPVC PIPE. 3. + STEEL PIPE IS NOT ALLOWED IN SIZES LESS THAN 1 INCH.

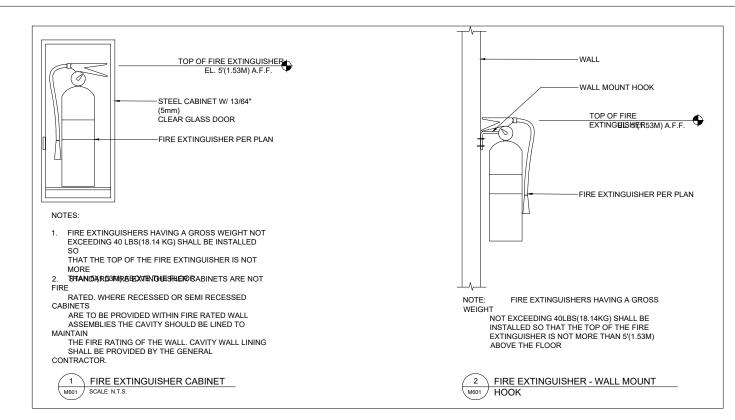
	SYMBOLS AND AB	BREV.	IATIONS
DESCRIPTION	SYMBOL		ABBREVIATIONS
	DLS AND ABBREVIATIONS INDICATED IS E NOT NECESSARILY WITHIN THE SCOPI		
X	NODE NO		
	FIRE SPRINKLER	A D D	ALIMOMATIC DALL DDID
SD	FIRE STANDPIPE PIPING	A.B.D.	AUTOMATIC BALL DRIP
SP	SPRINKLER PIPING (SP.)	A.D.	ACCESS DOOR
n	CDV DDAIN DIDING	CLG.	CEILING
	SPK DRAIN PIPING	C.V.	CHECK VALVE
	OS & Y VALVE W/ LOCK AND CHAIN	D.C.D.A.	DOUBLE CHECK DETECTOR ASSEMBLY
	WATER FLOW SWITCH	DN.	DOWN
<u>L</u>	CAPPED OUTLET	ELEV.	ELEVATION
	GATE VALVE (G.V.)	F.H.C.	FIRE HOSE CABINET
	LOCKSHIELD VALVE (GLOBE VALVE)	F.H.	FIRE HYDRANT
	CHECK VALVE (C.V.)	F.H.R.	FIRE HOSE RACK
	PRESSURE REGULATING VALVE	FL.	FLOOR
<del> </del>	STRAINER	G.V.	GATE VALVE
P	avaav i baabbeb	H.C.	HUNG CEILING
	SHOCK ABSORBER	N.I.C.	NOT IN CONTRACT
	PRESSURE GAUGE	0.S.&Y.	OUTSIDE SCREW & YOKE
	UNION CONNECTION	P.0.	PLUGGED OUTLET
HDCDAH	DOUBLE CHECK DETECTOR ASSEMBLY	T.S.	TAMPER SWITCH
HV	HOSE VALVE	WFS	WATER FLOW SWITCH
HR SR	HOSE RACK SPRINKLER RIG ASSEMBLY	TS	TAMPER SWITCH
RM	ROOF MANIFOLD	SPK	SPRINKLER











NO.	DATE	DESCRIPTION
1		
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$\triangle$		
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12		
SEAL:		•

DEVELOPMENT INFORMATION:

SITE ADDRESS:

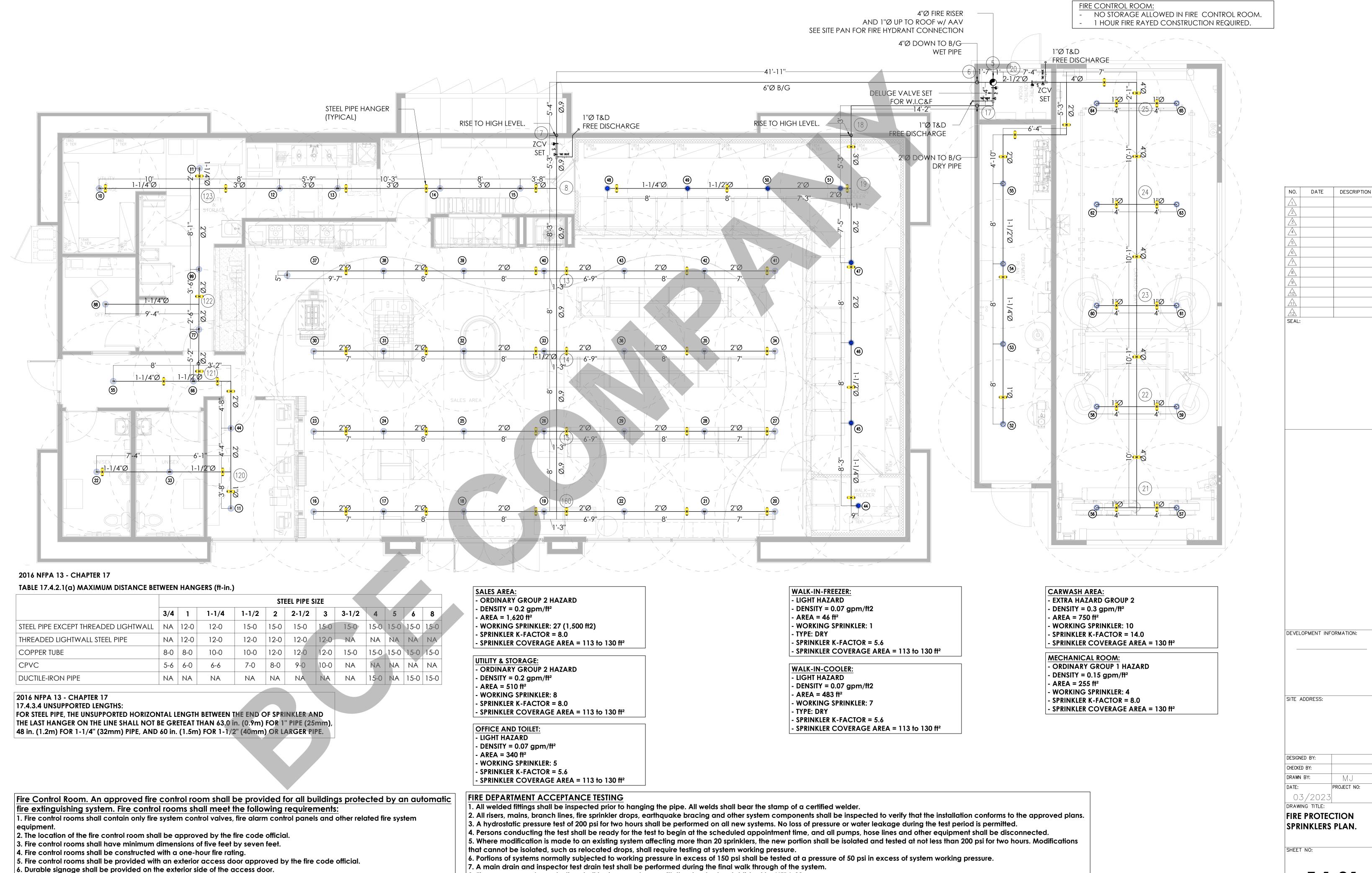
ADDRESS 1930 BLUE OAKS BL ROSEVILLE, CA 95747

DESIGNED BY: CHECKED BY: DRAWN BY: PROJECT NO: DRAWING TITLE:

FIRE PROTECTION LEGEND, SYMBOL AND GENERAL DETAILS.

SHEET NO:

F 0.03



8. Fire pump acceptance testing shall be in accordance with the standards established by NFPA 20.

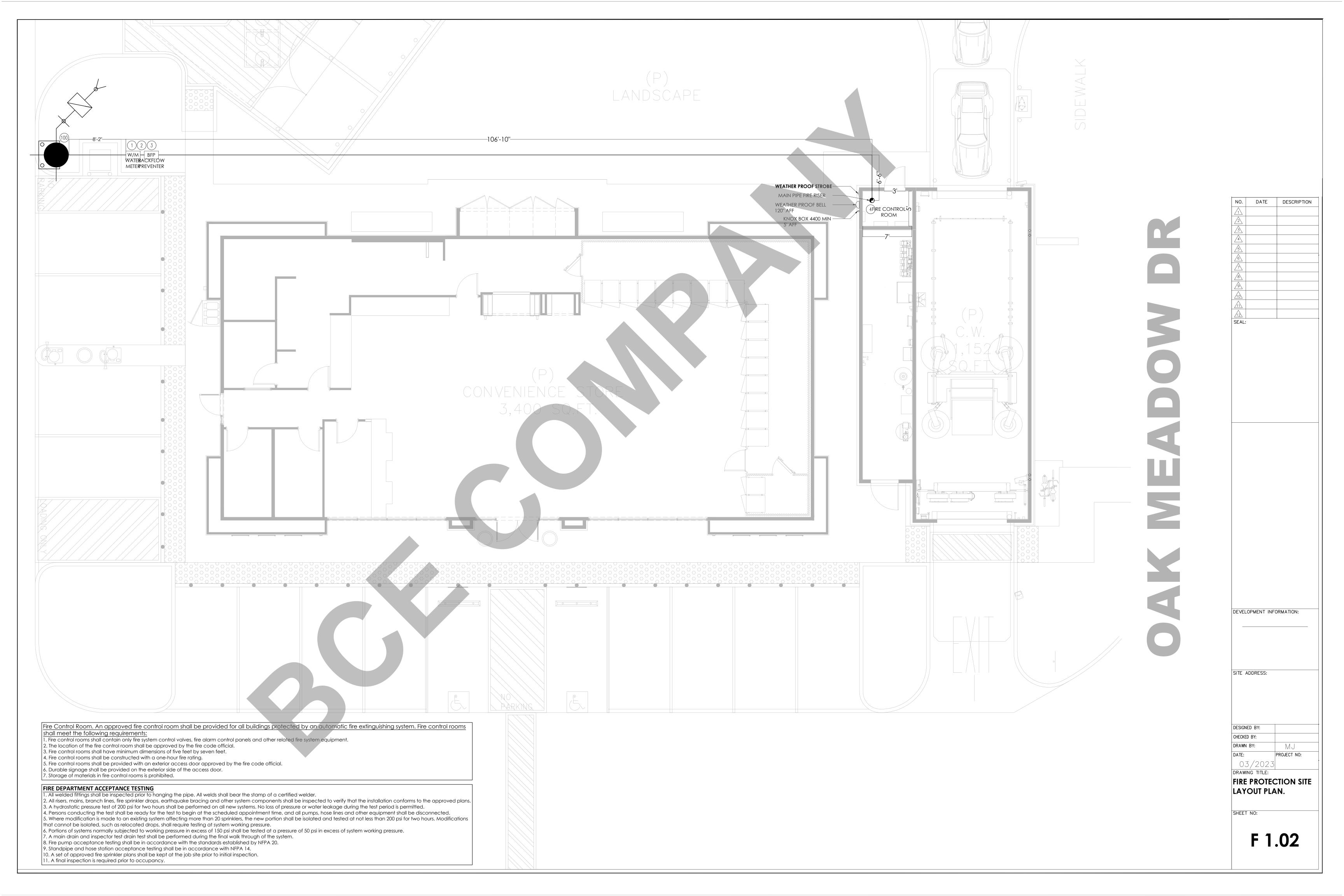
9. Standpipe and hose station acceptance testing shall be in accordance with NFPA 14. 10. A set of approved fire sprinkler plans shall be kept at the job site prior to initial inspection.

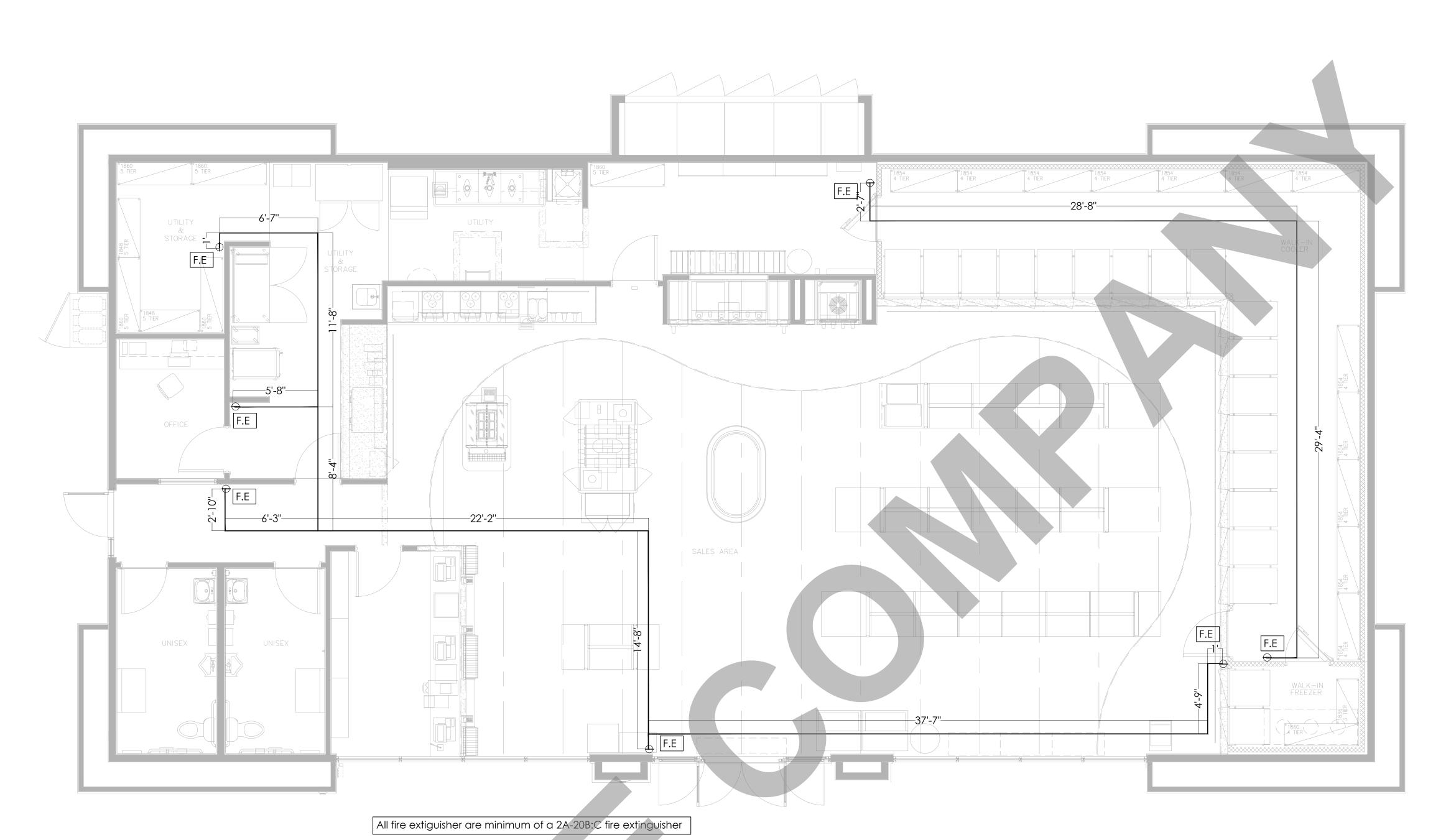
11. A final inspection is required prior to occupancy.

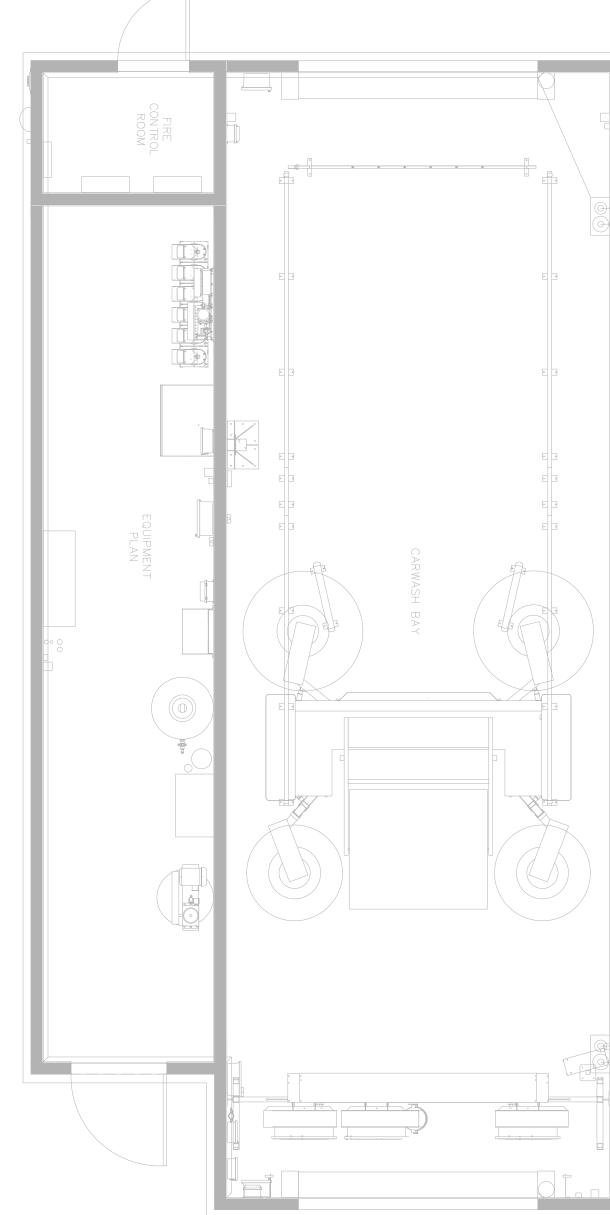
7. Storage of materials in fire control rooms is prohibited.

F 1.01

PROJECT NO:







NO. DATE DESCRIPTION

DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY: CHECKED BY: DRAWN BY: PROJECT NO: 03/2023 DRAWING TITLE:

FIRE PROTECTION FIRE EXTINGUISHERS LAYOUT.

SHEET NO:

F 2.01

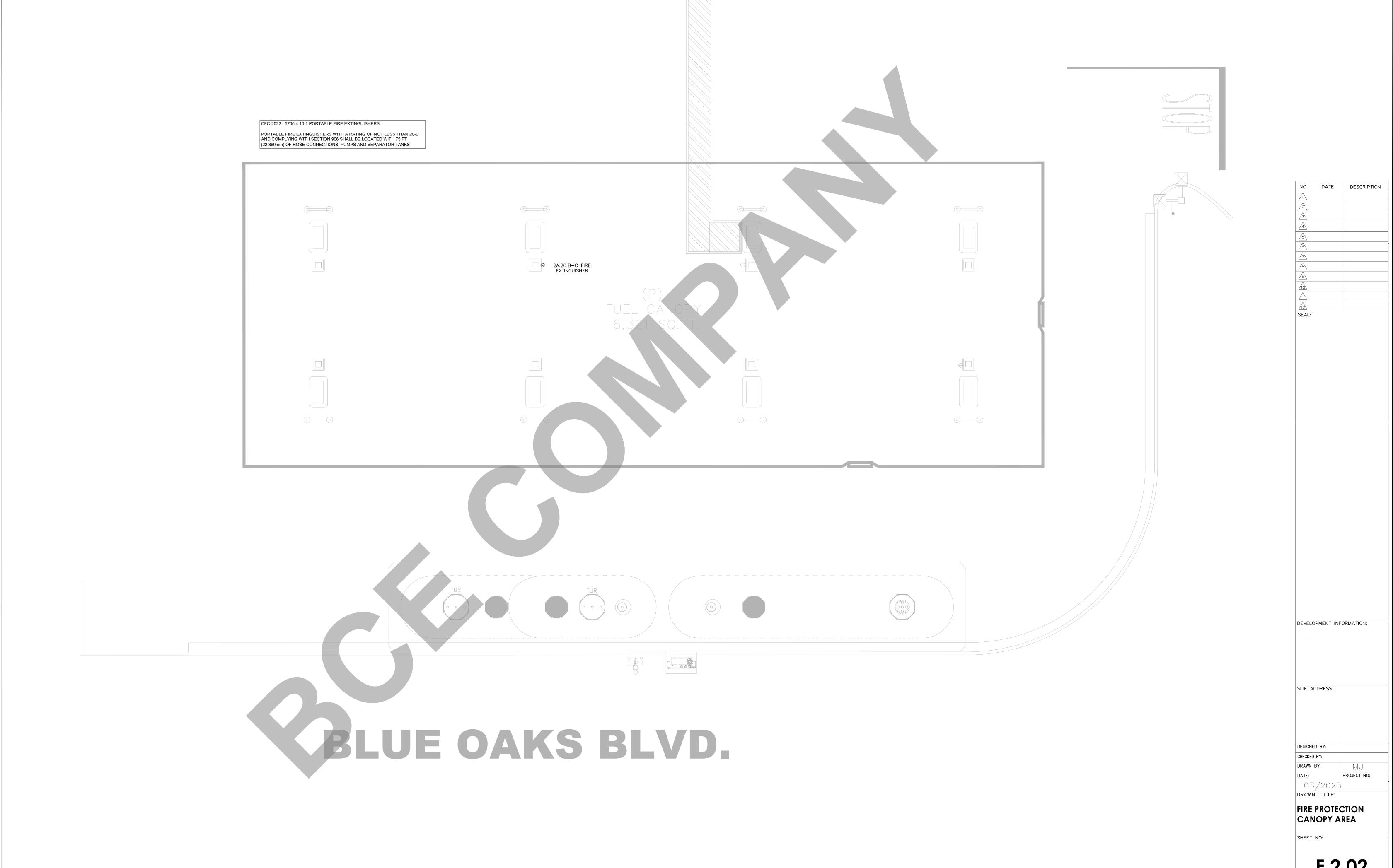
Fire Control Room. An approved fire control room shall be provided for all buildings protected by an automatic fire extinguishing system. Fire control rooms shall meet the following requirements: 1. Fire control rooms shall contain only fire system control valves, fire alarm control panels and other related fire system

equipment. 2. The location of the fire control room shall be approved by the fire code official.

3. Fire control rooms shall have minimum dimensions of five feet by seven feet.

4. Fire control rooms shall be constructed with a one-hour fire rating.

5. Fire control rooms shall be provided with an exterior access door approved by the fire code official.
6. Durable signage shall be provided on the exterior side of the access door.
7. Storage of materials in fire control rooms is prohibited.



F 2.02



Worldwide Contacts www.tyco-fire.com

Series TY-L - 5.6 and 8.0 K-factor **Upright, Pendent, and Recessed Pendent Sprinklers** Standard Response, Standard Coverage

P2300 for warnings pertaining to egulatory and health information Always refer to Technical Dat Sheet TFP700 for the "INSTALLE 'ARNING" that provides caution with respect to handling and instal-lation of sprinkler systems and components. Improper handling and nstallation can permanently damage a sprinkler system or its compo-nents and cause the sprinkler to fail o operate in a fire situation or cause

to operate prematurely.

(3/4 in. NPT) Recessed Escutcheon The Recessed Escutcheon provides 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12.7 mm) of total adjustment from the flush pendent position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut. applicable, are utilized to extend the life of copper alloy sprinklers beyond what would be obtained when exposed to corrosive atmospheres. Although

Scan the QR code or enter the UR n a web browser to access the mocorrosion-resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencument. Data rates may apply. cies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end-user be consulted about the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/ the sprinklers will be exposed. docs.jci.com/tycofire/ series-ty-l-5-6-and-8K Series TY-L Pendent Sprinkler can be obtained by utilizing the Series TY-L Pendent Sprinkler in combination with systems only.

General

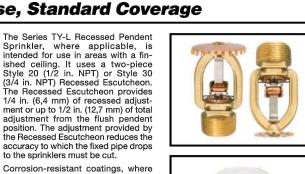
NOTICE
The Series TY-L 5.6 and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers described herein **Description** The TYCO Series TY-L 5.6 and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprin-klers described herein are stanmust be installed and maintained in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION dard response, standard coverage, solder type spray sprinklers. They are designed for use in light, ordinary, and solder type spray sprinklers. They are designed for use in light, ordinary, and extra-hazard commercial occupancies such as banks, hotels, shopping malls, factories, refineries, and chemical plants.

Or the NATIONAL FIRE PROTECTION (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

Ty4911 ... Pendent 8.0K, 3/4 lin. NPT Ty4911 ... Pendent 8.0K, 1/2 in. NPT Ty

Page 1 of 6

NOVEMBER 2021





chemical velocity, should be considered as a minimum, along with the corrosive nature of the chemical to which NFPA 13 prohibits installation of 1/2 in. An intermediate level version of the Series TY-L Pendent Sprinkler can be intended for retrofit in existing sprinkle

Sprinkler Identification Number (SIN) TY3111 . . . Upright 5.6K, 1/2 in. NPT TY3211 . . . Pendent 5.6K, 1/2 in. NPT TY4111 . . . Upright 8.0K, 3/4 in. NPT TY3111 is a re-designation for S1800 and G3111
TY3211 is a re-designation for S1801 and G3112
TY4111 is a re-designation for S1810 and G3101
TY4211 is a re-designation for S1811 and G3102
TY4811 is a re-designation for S1805
TY4911 is a re-designation for S1806

#### Page 2 of 6 1 - Frame 3 - Ejection 5 - Strut 2 - Sealing Spring 6 - Hook Button 4 - Fusible 7 - Deflector Element is indicated on ISO 7-1 can be provided on (11,1 mm) NOMINAL MAKE-IN STYLE 20 RECESSED 1/2" NPT\*\* 2-7/8" (73,0 mm) DIA. —— WRENCH FLANGES UPRIGHT RECESSED PENDENT SERIES TY-L UPRIGHT (TY3111) AND PENDENT (TY3211) SPRINKLERS, 5.6 K-FACTOR, 1/2 IN. NPT 1 - Frame 3 - Ejection 5 - Strut 2 - Sealing Spring 6 - Hook 7 - Deflector\* Element 5 - Strut 6 - Hook 7 - Deflector\* ESCUTCHEON PLATE SEATING SURFACE STYLE 30 RECESSED ESCUTCHEON 2-7/8" (73,0 mm) DIA. 3/4" NPT\*\* FIGURE 2 SERIES TY-L UPRIGHT (TY4111) AND PENDENT (TY4211) SPRINKLERS, 8.0 K-FACTOR, 3/4 IN. NPT 1 - Frame 3 - Ejection 5 - Strut 2 - Sealing Spring 6 - Hook Button 4 - Fusible 7 - Deflector Element \*\* Pipe thread connections per ISO 7-1 can be provided on SURFACE (11,1 mm) NOMINAL MAKE-IN STYLE 20 RECESSED 1/2" NPT\*\* WRENCH FLANGES 2-7/8" (73,0 mm) DIA.

SERIES TY-L UPRIGHT (TY4811) AND PENDENT (TY4911) SPRINKLERS, 8.0 K-FACTOR, 1/2 IN. NPT

#### Page 3 of 6 Wax Wax-Over-Lead Coated Coated Natural Chrome Lead Brass Plated Coated 165°F (74°C) Unpainted Upright (TY3111) 212°F (100°C) 1, 2, 3, 5 1, 2, 3 1, 2, 3 280°F (138°C) Blue 165°F (74°C) Unpainted 212°F (100°C) White Recessed Pendent (TY3211 w/Style 20) N/A6

TABLE A
SERIES TY-L 5.6 K-FACTOR SPRINKLERS LABORATORY LISTINGS AND APPROVAL

		T	Frame	Sprinkler Finish					
K-Factor	Туре	Temperature Rating	Color Code	Natural Brass	Chrome Plated	Lead Coated	Wax Coated	Wax-Over-Lead Coated	
		165°F (74°C)	Unpainted				4.0.0		
	Upright (TY4111)	212°F (100°C)	White	1, 2,	1, 2, 3, 5		1, 2, 3		
		280°F (138°C)	Blue			1, 2	4	N/A	
8.0		165°F (74°C)	Unpainted				400		
3/4 in. NPT	Pendent (TY4211)	212°F (100°C)	White	1, 2, 3		1, 2, 3			
		280°F (138°C)	Blue			1, 2	4	N/A	
	Recessed Pendent (TY4211 w/Style 30)	165°F (74°C)	Unpainted	1, 2			N/A		
		212°F (100°C)	White	١,	2	IN/A			
		165°F (74°C)	Unpainted			1, 2, 3			
	Upright (TY4811)	212°F (100°C)	White	1, 2,	3, 5				
		280°F (138°C)	Blue			1, 2 N/A		N/A	
8.0 1/2 in.		165°F (74°C)	Unpainted				400		
NPT	Pendent (TY4911)	212°F (100°C)	White	1, 2	2, 3		1,2,3		
		280°F (138°C)	Blue			1, 2 N/A		N/A	
	Recessed Pendent	165°F (74°C)	Unpainted	4	4.0		NI/A		
	(TY4911 w/Style 20)	212°F (100°C)	White	1, 2		N/A			

 FM Approved for maximum 150°F (68°C) ambient temperatures
 LPCB Approved (LPCB Ref. No. 094a/03)
 Not Available (N/A) TABLE B SERIES TY-L 8.0 K-FACTOR SPRINKLERS

Technical Data Approvals
UL and C-UL Listed FM and LPCB Approved See Tables A and B for complete approval information including corrosion resistant status.

Maximum Working Pressure

Discharge Coefficient K=5.6 gpm/psi½ (80,6 Lpm/bar½) K=8.0 gpm/psi½ (115,2 Lpm/bar½) Temperature Ratings Sprinkler: See Tables A and B Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated



TFP110

## tyco.

Worldwide Contacts www.tyco-fire.com

Operation

The glass bulb contains a fluid which

expands when exposed to heat. When

the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to

**TFP319** 

Model ESFR-14 14.0 K-factor Pendent Sprinklers Early Suppression, Fast Response

taining their fire protection system and devices in proper operating con-dition. Contact the installing contrac-

data sheet are not intended to provide

General Description TYCO Model ESFR-14, 14.0 K-factor, Pendent Sprinklers are Early Suppressions. Pendent Sprinklers are Early Suppression, Fast Response (ESFR) sprinklers having a nominal K-factor of 14.0.
They are suppression-mode sprinklers that are especially advantageous as a means of eliminating the use of in-rack sprinklers when protecting high-piled.

The general guidelines in this tentional content of the protecting high-piled. sprinklers when protecting high-piled The general guidelines in this technica Model ESFR-14 Sprinklers are primarily designed for protection of the following storage arrangements: most encapsulated or non-encap

NOTICE

mance of these devices.

Page 1 of 4

Sprinkler Identification Number (SIN) cartoned, unexpanded plastics some storage arrangements of rubber tires, roll paper, flammable Refer to Table A for sprinkler identifica-For more specific criteria, refer to Table B in this technical data sheet as well as the applicable design standard.

Technical Technical Data Data

The TYCO Model ESFR-14 Sprinklers UL and C-UL Lister described herein must be installed FM Approved and maintained in compliance with this document, as well as with the applica-Natural Brass ble standards of the National Fire Pro-tection Association (NFPA), in addition to the standards of any other authorities having jurisdiction, such as FM Global. Failure to do so may impair the perfor-Physical Characteristics
Frame
Deflector Sealing Assembly . . Beryllium Nickel w/TEFLON Additional Technical Data cal data.

IMPORTANT
Refer to Technical Data Shee
TFP2300 for warnings pertaining to egulatory and health information Always refer to Technical Data Sheet TFP700 for the "INSTALLEF WARNING" that provides cautions with respect to handling and insta lation of sprinkler systems and components. Improper handling an nstallation can permanently dama a sprinkler system or its comp nents and cause the sprinkler to fai to operate in a fire situation or cause it to operate prematurely.

**AUGUST 2018** 

## Page 2 of 4

1 - Frame 2 - Deflector\* 1-1/2" (38,1 mm) 6 - Sealing Assembly indicated on Deflector. CENTERLINE ISO 7-1 can be provided on special request. MODEL ESFR-14, 14.0 K-FACTOR, PENDENT SPRINKLER

ESFR-14 Sprinklers in each channel Description formed by the structural members Ceiling Slope

Item Sprinkler Identification Number (SIN) TY6236 155°F (68°C) 200°F (93°C) Temperature Rating °F (°C) Thread Size 3/4 in. NPT or ISO 7-1 Sprinkler Orientation Pendent Maximum Working Pressure, psi (bar) 175 psi (12 bar) TABLE A MODEL ESFR-14 PENDENT SPRINKLER TECHNICAL DATA

the following data sheets describe other TYCO ESFR Sprinklers:

members, such as beams and stem, exceed 12 in. (302 mm), install Model

Care and

• TFP312

• TFP313

TFP315

Model ESFR-25 (TY9226) K=25.2 Pendent Sprinkler

Model ESFR-22 (TY8226) K=22.4 Pendnet Sprinkler

Design Criteria The following general guidelines provided for the TYCO Model ESFR-14, 14.0 K-factor, Pendent Sprinklers can be used for quick reference.

tion and FM Approvals provide instal-lation standards that must be used to properly design an automatic sprinkler system utilizing Early Suppression, Fast Response (ESFR) Sprinklers. The guidelines provided by NFPA and FM Global may differ; consequently, the appropriate standard must be used for a given installation. In all cases, the appropriate NFPA or FM Approvals installation standard must be referenced to assure applicability and to obtain complete installation guidelines, since the following general guidelines are not intended to provide complete installation criteria. tion; for example, smooth ceiling, bar joists, beam and girder, and so forth. In addition to this technical data sheet, Where the depths of solid structural

The National Fire Protection Associa-

Model ESFR-17 (TY7226) K=16.8 Pendent Sprinkler FM Global 2-0 TFP316 Model ESFR-17 (TY7126) K=16.8 Upright Sprinkler able deflector-to-ceiling distances as well as thermal-sensing element-to-• TFP317 Model ESFR-17 (TY7223) K=16.8 Pendent Sprinkler TFP318
 Model ESFR-1 (TY6226)
 K=14.0 Pendent Sprinkler • TFP320 Model ESFR-17 (TY7229) K=16.8 Pendent Sprinkler Roof Construction Unobstructed or obstructed construction

In some cases, the installation stan dards permit a greater coverage area Minimum Coverage Area NFPA 13 / FM Global 2-0 Maximum Spacing
12 ft (3,7 m) for building heights up to 10 ft (3,1 m) for building heights greater NO. DATE Minimum Spacing 8 ft (2,4 m) Minimum Clearance to Commodity Deflector-to-Ceiling Distance 6 in. to 14 in. (152 mm to 356 mm Consult FM Global guidelines for allow

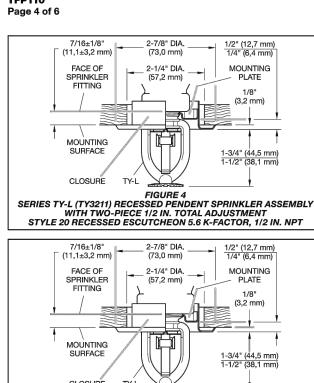
SEAL:

DESCRIPTION

Maximum 2 in. rise for 12 in. run (16.7%)

Maximum Coverage Area

NFPA 13



CLOSURE TY-L SERIES TY-L (TY4211) RECESSED PENDENT SPRINKLER ASSEMBLY WITH TWÓ-PIECE 1/2 IN. TOTAL ADJUSTMENT STYLE 30 RECESSED ESCUTCHEON 8.0 K-FACTOR, 3/4 IN. NPT FACE OF SPRINKLER FITTING 2-1/4" DIA. MOUNTING PLATE FITTING 1/8" (3,2 mm) MOUNTING SURFACE SERIES TY-L (TY4911) RECESSED PENDENT SPRINKLER ASSEMBLY WITH TWO-PIECE 1/2 IN. TOTAL ADJUSTMENT

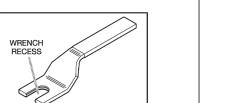


FIGURE 7 W-TYPE 9 SPRINKLER WRENCH

W-TYPE 10 RECESSED SPRINKLER WRENCH

## Design

UPRIGHT

8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers are intended for fire protection systems designed in accordance with the stanagency, such as the UL Listing based on the requirements of NFPA 13 and • After wrench tightening the sprin-FM Approval based on the require-

Operation A copper tube sealed by two stainless the rated temperature is reached, the alloy melts and the balls are forced

PENDENT

in. adjustable Crescent wrench. With Series TY-L Recessed Pendent reference to Figures 1, 2, and 3, apply the W-Type 9 Sprinkler Wrench to the wrench area, or as applicable, apply the adjustable Crescent wrench to the dance with the following instructions: wrenching flanges. tension mechanism and allows the sprinkler to operate.

When installing wax-coated sprinklers with the adjustable Crescent wrench, take care to prevent damage to the with the adjustable Crescent wrench, take care to prevent damage to the wax coating on the sprinkler wrench

flats or frame arms and, consequently, exposure of bare metal to the corrosive environment:

The TYCO Series TY-L 5.6 and 8.0 K-factor Upright. Pendent, and 8.0 K-factor Upright. Pendent and 8.0 K-factor Upright. ciently wide to pass over the wrench flats without damaging the wax or 3, apply the W-Type 10 Recessed Sprinkler Wrench to the sprinkler wrenching flanges. coating. Before wrench tightening the sprinkler, adjust the jaws of the wrench to just contact the sprinkler flats.

After wrench tightening the sprinkler flats.

After wrench tightening the sprinkler flats. kler, loosen the wrench jaws before comes in contact with the ceiling. Sheets. Use only the Style 20 or 30 Recessed Escutcheon, as applicable, for recessed pendent installations.

After Installation After installation, complete the following:

Care and

RECESSED PENDENT

Installation

The TYCO Series TY-L 5.6 and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers must be installed in accordance with this section.

General Instructions
A leak tight 1/2 in. NPT sprinkler joint to the damaged areas of the wax, to smooth it back over areas where bare metal is exposed.

main control valve for maintenance work on the fire protection system that

A leak tight 1/2 in. NPT sprinkler joint should be obtained with a torque of 7 to 14 ft-lb (9,5 to 19,0 Nm). A leak- tight 3/4 in. NPT sprinkler joint should be obtained with a torque of 10 to 20 ft-lb (13,4 to 26,8 Nm). Higher levels of torque may distort the sprinkler inlet and cause leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

Series TY-L Upright and Pendent

to smooth it back over areas where bare metal is exposed.

NOTICE

Only retouching of the wax coating applied to the wrench flats and frame arms is permitted, and the retouching is to be performed only at the time of the initial sprinkler installation.

The steel rod should be heated only to the point it can begin to melt the wax, and appropriate precautions need to be taken when handling the heated ord to prevent the installer from being burned.

Series TY-L Upright and Pendent the sprinkler fitting to suit.

Series TY-L Upright and Pendent Sprinklers Installation
The Series TY-L Pendent and Upright Sprinklers must be installed in accordance with the following instructions:

Step 1. Install pendent sprinklers in the pendent position. Install upright position.

Step 2. With pipe thread sealant applied to the pipe threads, handighed to the pipe threads, handighed to the pipe threads, handighed to the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler wax stick to the rod approximately 1/2 in. (12,7 mm) away from the area requiring retouching. The wax will melt and run down onto the sprinkler.

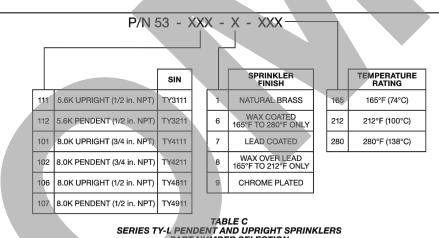
**TFP110** Page 6 of 6

**TFP110** 

Page 5 of 6

Sprinklers Installation
The Series TY-L Recessed Pendent

Step 1. After installing the Style 20 or 30 Mounting Plate, as applicable, over the sprinkler threads and with



completed, to verify the integrity of the corrosion-resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made so as to better determine the exact sprinkler condition and the long-term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

The owner is responsible for the

in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, such as, NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified inspection Service in accordance with local requirements and/or national codes.

(P/N).

Sprinkler Assemblies with NPT
Thread Connections
Specify Series TY-L (specify SIN), (specify Upright, Pendent, or Recessed Pendent) Sprinklers. Standard Coverage, (specify) temperature rating, (specify) finish or coating, P/N (specify which is 150°F (65°C).

Recessed Escutcheon
Specify: Style (specify) Recessed Escutcheon, (specify) finish, P/N (specify) finish, P/N (specify))

Refer to Technical Data Sheet TFP770 \*Refer to Technical Data Sheet TFP770

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					Ì				
		P/N 5	53 - >	XX	X -	X - XXX			
			SIN			SPRINKLER FINISH			TEMPERATURE RATING
	111	5.6K UPRIGHT (1/2 in. NPT)	TY3111		1	NATURAL BRASS		165	165°F (74°C)
	112	5.6K PENDENT (1/2 in. NPT)	TY3211		6	WAX COATED 165°F TO 280°F ONLY		212	212°F (100°C)
	101	8.0K UPRIGHT (3/4 in. NPT)	TY4111		7	LEAD COATED		280	280°F (138°C)
	102	8.0K PENDENT (3/4 in. NPT)	TY4211		8	WAX OVER LEAD 165°F TO 212°F ONLY	'		
	106	8.0K UPRIGHT (1/2 in. NPT)	TY4811		9	CHROME PLATED			
	107	8.0K PENDENT (1/2 in. NPT)	TY4911						
1		SERIES T			NT AI	LE C ND UPRIGHT SPRIN R SELECTION	KLE	RS	
_									

Sprinkler Wrench Specify: W-Type 9 Sprinkler Wrench, P/N 56-000-1-849 Specify: W-Type 10 Sprinkler Wrench, P/N 56-000-1-948 For warranty terms and conditions, visit Wax Sticks (for retouching wrenchdamaged wax coating)
Specify: Series TY-L Sprinklers, (specify color), color coded Wax Stick for retouching, (specify) temperature rated, P/N (specify):

ent as of document revision date and are subject to change without notice.

TFP319 Page 3 of 4 FM Global ESFR Storage QR QR

Sprinkler Type Response Type Wet Wet System Type Temperature Rating °F (°C) Open Frame (i.e., no solid shelves) Single, Double, Multiple-Row, or Portable Rack Storage of Class I-IV and Group A or Refer to NFPA 13 Refer to FM 2-0 and 8-9 Solid Pile or Palletized Storage of Class I-IV and Group A or B Plastics Refer to NFPA 13 Refer to FM 2-0 and 8-9 Refer to FM 2-0 and 8-3 Rubber Tire Storage Refer to NFPA 13 Roll Paper Storage (Refer to the Standard) Refer to NFPA 13 Refer to FM 8-21 Flammable/Ignitable Liquid Storage (Refer to the Standard) Refer to NFPA 30 Refer to FM 7-29 Aerosol Storage (Refer to the Standard) Refer to NFPA 30B Refer to FM 7-31 Automotive Components in Portable Racks (Control mode only; refer to the Standard) N/A N/A

TABLE B
MODEL ESFR-14 PENDENT SPRINKLERS
COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW

TFP319 Page 4 of 4
"FITTING SIDE" TOWARD SPRINKLI FITTING WRENCH RECESS
FIGURE 2 W-TYPE 34 SPRINKLER WRENCH
Installation
TYCO Model ESFR-14 Pendent S klers must be installed in accorda with this section.
General Instructions Do not install any bulb type sprir if the bulb is cracked or there is a of liquid from the bulb. With the si kler held horizontally, a small air bu should be present.
A leak-tight 3/4 in. NPT sprinkler should be obtained by applying a imum-to-maximum torque of 10 t lb-ft (13,4 to 26,8 N·m). Higher le of torque can distort the sprinkler with consequent leakage or impairr of the sprinkler.

Step 1. With pipe thread sealant 
The owner is responsible for the Step 2. Wrench-tighten the Model ESFR-14 Sprinkler using only the W-Type 34 Sprinkler Wrench (Ref. Figure 2) and by tilly conceins (cathor). the sprinkler fitting. Figure 2) and by fully engaging (seating) the wrench on the sprinkler wrench flats (Ref. Figure 1). Step 3. After installation, inspect the bulb of each Model ESFR-14 Sprinkler for damage. In particular, verify that the bulb is not cracked. Replace damaged ommended to be inspected, tested, and maintained by a qualified Inspec-

applied, hand-tighten the sprinkler into inspection, testing, and maintenance of the sprinkler fitting. inspection, testing, and maintenance of their fire protection system and devices ation, such as NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer

tion Service in accordance with local requirements and/or national codes.

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Maintenance Warranty TYCO Model ESFR-14, 14.0 K-factor, For warranty terms and conditions, visit Pendent Sprinklers (TY6236) must be maintained and serviced in accordance with this section.

www.tyco-fire.com.

ordering **Ordering** main control valve for maintenance work on the fire protection system that it controls obtain accordance. Before closing a fire protection system Contact your local distributor for availthat it controls, obtain permission to that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities ability. When placing an order, indicate the full product name and Part Number systems from the proper authorities and notify all personnel who may be affected by this action.

Sprinkler Assemblies

Specify: Model ESFR-14 (TY6236), K=14.0, Pendent Sprinkler with leaking or exhibiting visible signs of corrosion must be replaced. (specify) temperature rating, Natura Brass, P/N (specify): dance Automatic sprinklers must never be Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to Sprinkler Assemblies with

Limited

a loss sprinkers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Sprinkler Assemblies with 1807-1 Thread Connections
Specify: Model ESFR-14 (TY6236), K=14.0, Early Suppression, Fast Response Pendent Sprinkler with ISO 7-1 Thread Connection, (specify)

**DEVELOPMENT INFORMATION:** 

SITE ADDRESS:

DESIGNED BY: CHECKED BY: DRAWN BY: PROJECT NO:

DRAWING TITLE: FIRE SPRINKLERS DATA

SHEET NO:

F 3.01

### **ROSEVILLE - CARWASH "EXTRA HAZARD GRP 2"** Fire Sprinkler Reports

638.97

1300.00

Fire - Fire Sprinkler Hydraulics Calculation pReJkEr Hell	on Program		4	Elite Software I Roseville - Carwash "E	Development, Inc. xtra Hazard Grp 2" Page 2
General Project Data	Report				
General Data					
Project Title:  Roseville - Ca Grp 2" BCE - MJ Code Reference: Client Name: Address: Company Name: Company Address: Phone: Building Name: Contact at Building: Address Of Building:	arwash "Extra	Hazard	Project File Name:  Date: Approving Agency: Phone: City, State Zip Code: Representative: City And State:  Building Owner: Phone at Building: City, State Zip Code:		
Project Data					
Description Of Hazard: Ex Design Area Of Water Application: Default Sprinkler K-Factor: Inside Hose Stream Allowance: In Rack Sprinkler Allowance:	c. Haz. Gp. 2 5000 14.00 0.00 0.00	K gpm	Sprinkler System Type: Maximum Area Per Sprinkler Default Pipe Material: Outside Hose Stream Allowa	SCHED 40 WET S	
Sprinkler Specifications Make: Size:	Тусо		Model: Temperature Rating:	0	F
Water Supply Test Data	£				
Source Of Information: Test Hydrant ID:			Date Of Test:		
Hydrant Elevation: Test Flow Rate: Calculated System Flow Rate: Available Residual Pressure At System Flow:	0 4000.00 638.97 59.93	gpm gpm	Static Pressure: Test Residual Pressure: Calculated Inflow Residual P	60.00 58.00 ressure: 53.26	psi
<b>Calculation Project Data</b>	a				
Calculation Mode: HMD Minimum Residual Pressure: Number Of Active Nodes: Number Of Active Pipes: Number Of Active Sprinklers:	Demand 20.00 22 21 10	psi	Minimum Desired Flow Dens Number Of Inactive Pipes: Number Of Inactive Sprinkle	0	gpm/ft²

-ire - Fire ReJkEr Hell	эргіпкіег ну	uraulics Galci	ılation Progra		<u> </u>		Ros	eville - Carwas	are Developn h "Extra Haza
Fire S	Sprinkle	er Outp	ut Data						4
Overa	II Pipe	Output I	Data						
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
2 1	Meter 1.00 psi	-3.00 -3.00		52.13 52.13		0.00			
3 2	Backflo Prev 1.00 psi	-3.00 -3.00		51.13 52.13		638.97			
4	0.00	2.22	0.00	40.04	0.00 ~	0.00	0.04507	407.00	0.000
3	0.00 0.00 SCHE	-3.00 -3.00 D 40 WET S	0.00 0.00 TEEL	48.81 51.13	6.00 6.065 120	0.00 638.97 7.10	0.01537 ET 0	107.00 44.00 151.00	2.322 0.000 2.322
5 4	0.00 0.00 SCHE	9.00 -3.00 D 40 WET S	0.00 0.00 TEEL	42.98 48.81	6.00 6.065 120	0.00 638.97 7.10	0.01537 T 0	11.00 30.00 41.00	0.630 5.196 5.826
20 5	0.00 0.00 SCHE	9.00 9.00 D 40 WET S	0.00 0.00 TEEL	40.61 42.98	4.00 4.026 120	0.00 638.97 16.10	0.11310 T 0	1.00 20.00 21.00	2.375 0.000 2.375
25 20	0.00 0.00 SCHE	9.00 9.00 D 40 WET S	0.00 0.00 TEEL	35.41 40.61	4.00 4.026 120	0.00 638.97 16.10	0.11310 ET 0	16.00 30.00 46.00	5.202 0.000 5.202
56 21	14.00 0.00 SCHE	9.00 9.00 D 40 WET S	62.61 0.00 TEEL	20.00 31.83	1.00 1.049 120	62.61 62.61 23.24	1.07526 ET 0	4.00 7.00 11.00	11.828 0.000 11.828
57 21	14.00 0.00 SCHE	9.00 9.00 D 40 WET S	62.61 0.00 TEEL	20.00 31.83	1.00 1.049 120	62.61 62.61 23.24	1.07526 ET 0	4.00 7.00 11.00	11.828 0.000 11.828
21 22	0.00 0.00 SCHE	9.00 9.00 D 40 WET S	0.00 0.00 TEEL	31.83 31.99	4.00 4.026 120	0.00 125.22 3.16	0.00555 T 0	10.00 20.00 30.00	0.166 0.000 0.166
58 22	14.00 0.00 SCHE	9.00 9.00 D 40 WET S	62.78 0.00 TEEL	20.11 31.99	1.00 1.049 120	62.78 62.78 23.30	1.08061 ET 0	4.00 7.00 11.00	11.887 0.000 11.887
59 22	14.00 0.00 SCHE	9.00 9.00 D 40 WET S	62.78 0.00 TEEL	20.11 31.99	1.00 1.049 120	62.78 62.78 23.30	1.08061 ET 0	4.00 7.00 11.00	11.887 0.000 11.887
22 23	0.00 0.00 SCHE	9.00 9.00 D 40 WET S	0.00 0.00 TEEL	31.99 32.60	4.00 4.026 120	0.00 250.78 6.32	0.02004 T 0	10.00 20.00 30.00	0.601 0.000 0.601
23 24	0.00 0.00 SCHE	9.00 9.00 D 40 WET S	0.00 0.00 TEEL	32.60 33.20	4.00 4.026 120	0.00 250.78 6.32	0.02004 T 0	10.00 20.00 30.00	0.601 0.000 0.601

Nodal KFactor	Elevation (feet)	Spk/Hose Discharge	Residual Pressure		q (gpm) Q (gpm) Velocity	F. L./ft (psi/ft) Fittings	Pipe-Len. Fit-Len. Tot-Len.	PF-(psi) PE-(psi)
(K)	(1001)	(gpm)	(psi)	C-Value	(fps)	Type-Grp	(ft)	PT-(psi)
14.00	9.00	63.98	20.89	1.00	63.98	1.11922	4.00	12.311
0.00 SCHEI	9.00 D 40 WET S	0.00	33.20	1.049 120	63.98 23.75	ET 0	7.00 11.00	0.000 12.311
001161	D 70 WEI C	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		120	20.70		11.00	12.511
14.00 0.00	9.00 9.00	63.98 0.00	20.89 33.20	1.00 1.049	63.98 63.98	1.11922 ET	4.00 7.00	12.311 0.000
	9.00 D 40 WET S		33.20	120	23.75	0	11.00	12.311
44.00	0.00	62.00	20.00	4.00	62.00	4 44000	4.00	
14.00 0.00	9.00 9.00	63.98 0.00	20.89 33.20	1.00 1.049	63.98 63.98	1.11922 ET	4.00 7.00	12.311 0.000
SCHE	D 40 WET S			120	23.75	0	11.00	12.311
14.00	9.00	63.98	20.89	1.00	63.98	1.11922	4.00	12.311
0.00	9.00	0.00	33.20	1.049	63.98	ET	7.00	0.000
SCHE	D 40 WET S	IEEL		120	23.75	0	11.00	12.311
0.00	9.00	0.00	33.20	4.00	0.00	0.07363	10.00	2.209
0.00 SCHEI	9.00 D 40 WET S	0.00 STEEL	35.41	4.026 120	506.70 12.77	T 0	20.00 30.00	0.000 2.209
14.00 0.00	9.00 9.00	66.14 0.00	22.32 35.41	1.00 1.049	66.14 66.14	1.18997 ET	4.00 7.00	13.090 0.000
	D 40 WET S		33.41	120	24.55	0	11.00	13.090
14.00	0.00	66 14	22.22	1.00	66 14	1.18997	4.00	12 000
0.00	9.00 9.00	66.14 0.00	22.32 35.41	1.00 1.049	66.14 66.14	1.16997 ET	4.00 7.00	13.090 0.000
SCHE	D 40 WET S			120	24.55	0	11.00	13.090
0.00	-3.00	0.00	52.13	4.00	0.00	0.11310	10.00	1.131
0.00	-3.00	0.00	53.26	4.026	638.97		0.00	0.000
SCHE	D 40 WET S	SIEEL		120	16.10	0	10.00	1.131

Elite Software Development, Inc. Roseville - Carwash "Extra Hazard Grp 2"

Fire Sprinkler Output Data

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100

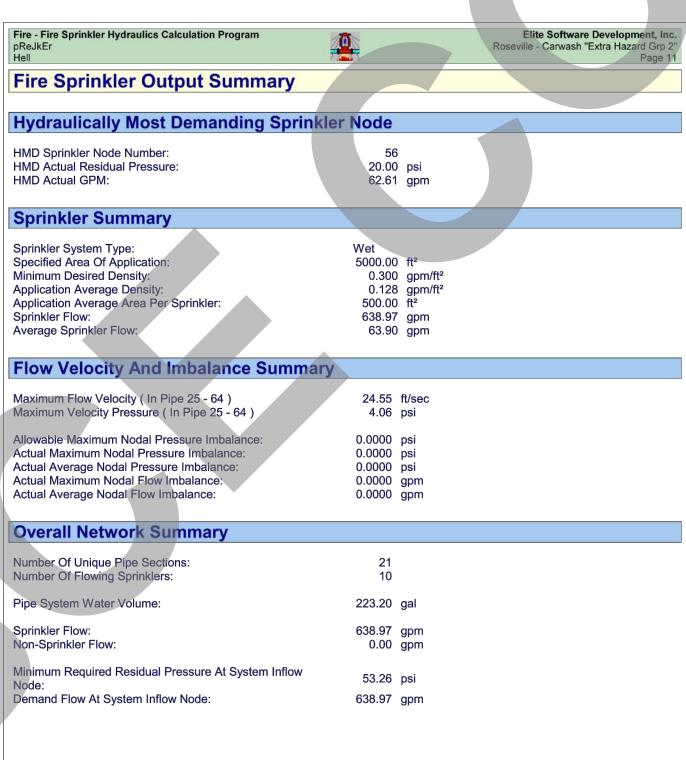
61

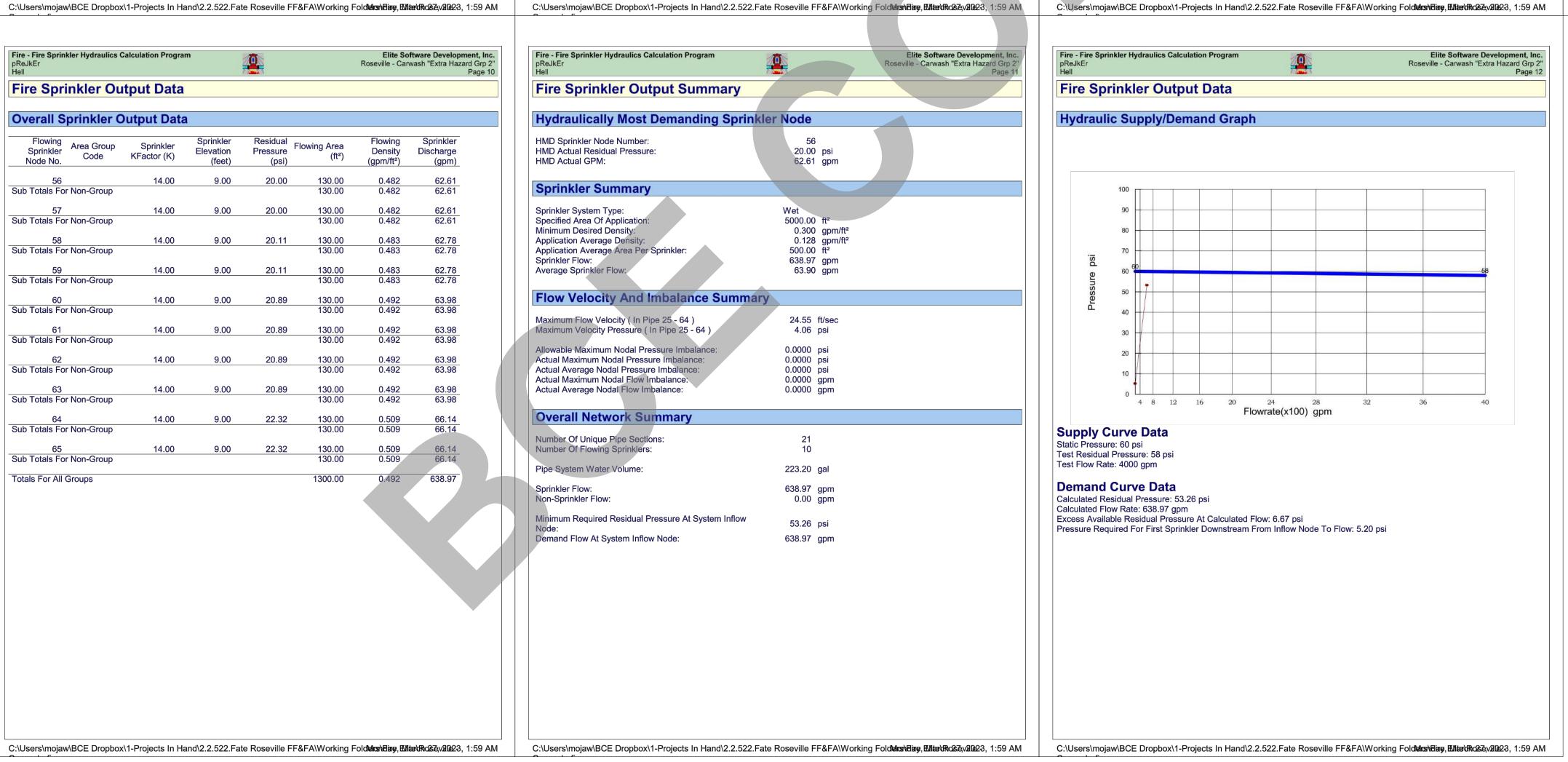
Overall Pipe Output Data (cont'd)

Fire - Fire Sprinkler Hydraulics pReJkEr Hell	Calculation Progra	ım	<b>2</b>			oftware Development wash "Extra Hazard G Pag
Fire Sprinkler O	utput Data					
Overall Sprinkler	Output Data	a				
Flowing Sprinkler Node No.	Sprinkler KFactor (K)	Sprinkler Elevation (feet)	Residual Pressure (psi)	Flowing Area (ft²)	Flowing Density (gpm/ft²)	Sprinkler Discharge (gpm)
56 Sub Totals For Non-Group	14.00	9.00	20.00	130.00 130.00	0.482 0.482	62.61 62.61
57	14.00	9.00	20.00	130.00	0.482	62.61
Sub Totals For Non-Group 58	14.00	9.00	20.11	130.00 130.00	0.482 0.483	62.61 62.78
Sub Totals For Non-Group	14.00	9.00	20.11	130.00	0.483	62.78
59 Sub Totals For Non-Group	14.00	9.00	20.11	130.00 130.00	0.483 0.483	62.78 62.78
60 Sub Totals For Non-Group	14.00	9.00	20.89	130.00 130.00	0.492 0.492	63.98 63.98
61	14.00	9.00	20.89	130.00	0.492	63.98
Sub Totals For Non-Group				130.00	0.492	63.98
62 Sub Totals For Non-Group	14.00	9.00	20.89	130.00 130.00	0.492 0.492	63.98 63.98
63 Sub Totals For Non-Group	14.00	9.00	20.89	130.00 130.00	0.492 0.492	63.98 63.98
64 Sub Totals For Non-Group	14.00	9.00	22.32	130.00 130.00	0.509 0.509	66.14 66.14
65	14.00	9.00	22.32	130.00	0.509	66.14
Sub Totals For Non-Group				130.00	0.509	66.14

Totals For All Groups

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DEVELOPMENT INFORMATION: SITE ADDRESS: DESIGNED BY: CHECKED BY: DRAWN BY: PROJECT NO:

F 4.01

DRAWING TITLE:

**REPORT** 

SHEET NO:

FIRE PROTECTION

CARWASH HYDRAULIC

## ROSEVILLE - MECH. RM. "ORDINARY GRP 1" Fire Sprinkler Reports

for

BCE - MJ

3/27/2023

<b>Fire - Fire Sprinkler Hyd</b> i pReJkEr Hell	raulics Calculatio	on Program		<u> </u>	Elite Software I Roseville - Mech. Rn	<b>Development, Inc</b> n. "Ordinary Grp 1 Page 2
General Proj	ect Data	Report				
General Data						
Project Title:	Roseville - Me	ech. Rm. "Ord	linary Grp	Project File Name:		
Designed By: Code Reference: Client Name: Address: Company Name: Company Address: Phone: Building Name: Contact at Building: Address Of Building:	BCE - MJ			Date: Approving Agency: Phone: City, State Zip Code: Representative: City And State: Building Owner: Phone at Building: City, State Zip Code:		
Project Data						
Description Of Hazard Design Area Of Water Default Sprinkler K-Fa Inside Hose Stream A In Rack Sprinkler Allo	r Application: actor: llowance:	Ordinary 1 1500 8.00 0.00 0.00	K gpm	Sprinkler System Type: Maximum Area Per Sprinkler: Default Pipe Material: Outside Hose Stream Allowan	Wet 113 SCHED 40 WET S ce: 0.00	TEEL
Sprinkler Specification Make: Size:	ns	Тусо		Model: Temperature Rating:	0	F
Water Supply	Test Data	C.				
Source Of Information Test Hydrant ID:	:			Date Of Test:		
Hydrant Elevation: Test Flow Rate: Calculated System Flo Available Residual Pre System Flow:		4000.00 144.44		Static Pressure: Test Residual Pressure: Calculated Inflow Residual Pre	60.00 58.00 essure: 42.46	psi
Calculation Pr	oject Data	a				
Calculation Mode: HMD Minimum Residu Number Of Active Noo Number Of Active Pipo Number Of Active Spr	des: es:	Demand 15.00 11 10 4	psi	Minimum Desired Flow Densit  Number Of Inactive Pipes:  Number Of Inactive Sprinklers	0	gpm/ft²

ire - Fire ReJkEr Iell	Sprinkler Hy	draulics Calc	ulation Prograi	n	<b>0</b>		R	Elite Softwa oseville - Mech	re Developme . Rm. "Ordinary
	Sprinkle	er Outp	ut Data		All and the second seco				
	4								
Overa	II Pipe (	Output I	Data						
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
2 1	Meter 1.00 psi	-3.00 -3.00		41.45 42.45		144.44	4		
	Backflo								
3	Prev	-3.00		40.44		144.44			
2	1.00 psi	-3.00		41.45					
4 3	0.00 0.00	-3.00 -3.00	0.00	40.30 40.44	6.00 6.065	0.00	0.00098 2E	120.00 28.00	0.145 0.000
	SCHE	D 40 WET S	STEEL		120	1.60	0	148.00	0.145
5	0.00	11.00	0.00	34.18	6.00	0.00	0.00098	11.00	0.054
4	0.00 SCHEI	-3.00 D 40 WET S	0.00 STEEL	40.30	6.065 120	144.44	ET 0	44.00 55.00	6.062 6.116
20 5	0.00 0.00 SCHE	11.00 11.00 D 40 WET S	0.00 0.00	33.97 34.18	4.00 4.026 120	0.00 144.44 3.64	0.00722 T	10.00 20.00 30.00	0.217 0.000 0.217
55 20	8.00 0.00	11.00 11.00	41.93 0.00	27.47 33.97	2.00 2.067	41.93 144.44	0.18563 2E	25.00 10.00	6.497 0.000
		D 40 WET S			120	13.81	0	35.00	6.497
52	8.00	11.00	30.98	15.00	1.00	30.98	0.29261	8.00	2.926
53	8.00 SCHEI	11.00 D 40 WET S	33.87 STEEL	17.93	1.049 120	30.98 11.50	E 0	2.00 10.00	0.000 2.926
50				17.02			0.20495		
53 54	8.00 8.00	11.00 11.00	33.87 37.65	17.93 22.15	1.25 1.380	33.87 64.86	0.30185 T	8.00 6.00	4.226 0.000
		D 40 WET S			120	13.91	0	14.00	4.226
54	8.00	11.00	37.65	22.15	1.50	37.65	0.33235	8.00	5.318
55	8.00 SCHEI	11.00 D 40 WET S	41.93 STEEL	27.47	1.610 120	102.51 16.15	T 0	8.00 16.00	0.000 5.318
				40.45					
1 100	0.00	-3.00 -3.00	0.00	42.45 42.46	6.00 6.065	0.00 144.44	0.00098	10.00 0.00	0.010 0.000
		D 40 WET S			120	1.60	0	10.00	0.010

<b>Fire - Fire Sprink</b> l pReJkEr Hell	ler Hydraulics C	Calculation Progra	m	<u> </u>			ftware Developme flech. Rm. "Ordinar	
Fire Sprii	nkler Ou	tput Data						
Overall Sp	rinkler C	output Data	ì					
Flowing Sprinkler Node No.	Area Group Code	Sprinkler KFactor (K)	Sprinkler Elevation (feet)	Residual Pressure (psi)	Flowing Area (ft²)	Flowing Density (gpm/ft²)	Sprinkler Discharge (gpm)	
52 Sub Totals For	Non Croup	8.00	11.00	15.00	113.00 113.00	0.274 0.274	30.98 30.98	
53 Sub Totals For		8.00	11.00	17.93	113.00 113.00 113.00	0.300 0.300	33.87 33.87	
54 Sub Totals For	Non-Group	8.00	11.00	22.15	113.00 113.00	0.333 0.333	37.65 37.65	
55 Sub Totals For	Non-Group	8.00	11.00	27.47	113.00 113.00	0.371	41.93 41.93	

Totals For All Groups

pReJkEr Hell	draulics Calculation Program			Elite Software Development, Roseville - Mech. Rm. "Ordinary Gr Pag
Fire Sprinkle	er Output Summa	ry		
Hydraulically	<b>Most Demanding S</b>	prinkler Node		
HMD Sprinkler Node	Number:	52		
HMD Actual Residua		15.00		
HMD Actual GPM:		30.98	gpm	
Sprinkler Sur	nmary			
		Mot		
Sprinkler System Type Specified Area Of Ap		Wet 1500.00	ft <sup>2</sup>	
Minimum Desired De			gpm/ft²	
Application Average			gpm/ft²	
Application Average		375.00	ft²	
Sprinkler Flow:		144.44		
Average Sprinkler FI	ow:	36.11	gpm	
Flow Velocity	And Imbalance Sur	mmary		
Maximum Flow Velo	city ( In Pipe 54 - 55 )	16.15	ft/sec	
	ressure (In Pipe 54 - 55)	1.76	psi	
Allowable Maximum	Nodal Pressure Imbalance:	0.0000	psi	
Actual Maximum No	dal Pressure Imbalance:	0.0000		
	al Pressure Imbalance:	0.0000		
Actual Maximum No		0.0000		
Actual Average Noda	al Flow Imbalance:	0.0000	gpm	
Overall Netwo	ork Summary			
Number Of Unique F	Pipe Sections:	10		
Number Of Flowing		4		
Pipe System Water \	Volume:	224.41	gal	
Sprinkler Flow:		144.44		
Non-Sprinkler Flow:		0.00	gpm	
-	Residual Pressure At System In	flow 42.46	psi	
Node:				
Demand Flow At Sys	stem Inflow Node:	144.44	gpm	

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ReJkEr Hell	rinklar	Outnut	Data	7.0	<b>1</b>			Mech. Rm. "Ordina	Page 9
rire Sp	rinkier	Output	Data						
Hydraul	ic Supp	ly/Dema	nd Graph	1					
	100				T	0	T		
	90					1-			
	80			_					
32_	70								
Pressure psi	60 60							<del></del>	
ssure	50	=							
Pre	40								
	30								
	20								
	10								
	4	8 12 1	6 20 Flo	owrate(x10	28 0) gpm	32	36	40	
upply (	Curve Da	ata							
tatic Pressu est Residua	re: 60 psi I Pressure:	58 psi							
est Flow Ra	te: 4000 gpr	m							
	Curve I	Data sure: 42.46	nsi						
alculated Fl	ow Rate: 14	4.44 gpm	At Calculated F	Flow: 17.54 p	si				
ressure Red	quired For Fi	irst Sprinkler	Downstream	From Inflow	Node To Flo	w: 8.06 psi			

DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

DATE:

03/2023

DRAWING TITLE:

FIRE PROTECTION
MECHANICAL ROOM
HYDRAULIC REPORT

SHEET NO:

F 4.02



Prepared By:

3/27/2023

<b>Fire - Fire Sprinkler Hyd</b> pReJkEr Hell	raulics Calculation Program		R		Development, Inc. ose "Light & Ordin" Page 2
General Proj	ect Data Report				
General Data					
Project Title:  Designed By: Code Reference: Client Name: Address: Company Name: Company Address: Phone: Building Name: Contact at Building: Address Of Building:	Roseville - Multipurpose "I Ordin" BCE - MJ	Light &	Project File Name:  Date: Approving Agency: Phone: City, State Zip Code: Representative: City And State:  Building Owner: Phone at Building: City, State Zip Code:		
Project Data					3
Description Of Hazard Design Area Of Wate Default Sprinkler K-Fa Inside Hose Stream A In Rack Sprinkler Allo	r Application: 1500 actor: 5.60 Illowance: 0.00	ft²	Sprinkler System Type: Maximum Area Per Sprinkler: Default Pipe Material: SC Outside Hose Stream Allowance:	Wet 113 CHED 40 WET S 0.00	ft²
Sprinkler Specification Make: Size:	ns Tyco	)	Model: Temperature Rating:	0	F
Water Supply	Test Data				
Source Of Informatior Test Hydrant ID:	n:		Date Of Test:		
Hydrant Elevation: Test Flow Rate: Calculated System Fl Available Residual Pr System Flow:	4000.00 ow Rate: 476.31	gpm	Static Pressure: Test Residual Pressure: Calculated Inflow Residual Pressu	60.00 58.00 ire: 52.83	psi
Calculation P	roject Data				
Calculation Mode: HMD Minimum Resid Number Of Active No Number Of Active Pip Number Of Active Sp	des: 27 es: 27	psi ,	Minimum Desired Flow Density:  Number Of Inactive Pipes:  Number Of Inactive Sprinklers:	0.07 0 0	gpm/ft²

pReJkEr Hell			ılation Progra	ond)	200		R	oseville - Multip	re Developn urpose "Ligh
Fire S	Sprinkle	er Outp	ut Data						
Overa	all Pipe (	Output [	Data						
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
2 1	Meter 0.00 psi	-3.00 -3.00		52.76 52.76		476.31			
3 2	Backflo Prev 0.00 psi	-3.00 -3.00		52.76 52.76		474.31			
4 3	0.00 0.00 SCHEI	-3.00 -3.00 D 40 WET S	0.00 0.00 TEEL	51.53 52.76	6.00 6.065 120	0.00 474.31 5.27	0.00886 2E 0	110.00 28.00 138.00	1.222 0.000 1.222
5 4	0.00 0.00 SCHEI	11.00 -3.00 D 40 WET S	0.00 0.00 TEEL	45.25 51.53	6.00 6.065 120	0.00 474.31 5.27	0.00886 E 0	11.00 14.00 25.00	0.221 6.062 6.283
6 5	0.00 0.00 SCHEI	-3.00 11.00 D 40 WET S	0.00 0.00 TEEL	51.22 45.25	6.00 6.065 120	0.00 474.31 5.27	0.00886	11.00 0.00 11.00	0.097 -6.062 -5.965
7 6	0.00 0.00 SCHEI	11.00 -3.00 D 40 WET S	0.00 0.00 TEEL	44.34 51.22	6.00 6.065 120	0.00 474.31 5.27	0.00886 3E 0	50.00 42.00 92.00	0.815 6.062 6.877
8 7	0.00 0.00 SCHEI	11.00 11.00 D 40 WET S	0.00 0.00 TEEL	44.02 44.34	6.00 6.065 120	0.00 474.31 5.27	0.00886 T 0	5.50 30.00 35.50	0.314 0.000 0.314
15 8	8.00 0.00 SCHEI	11.00 11.00 D 40 WET S	50.20 0.00 TEEL	39.37 44.02	3.00 3.068 120	50.20 474.31 20.58	0.24476 T 0	4.00 15.00 19.00	4.651 0.000 4.651
11 120	8.00 0.00 SCHEI	11.00 11.00 D 40 WET S	36.06 0.00 TEEL	20.32 16.36	1.00 1.049 120	0.00 48.12 17.86	0.66066 E 0	4.00 2.00 6.00	3.964 0.000 3.964
123 12	0.00 8.00 SCHEI	11.00 11.00 D 40 WET S	0.00 42.31 TEEL	25.70 27.97	3.00 3.068 120	0.00 290.33 12.60	0.09871 T 0	8.00 15.00 23.00	2.270 0.000 2.270
12 13	8.00 8.00 SCHE	11.00 11.00 D 40 WET S	42.31 44.28 TEEL	27.97 30.64	3.00 3.068 120	42.31 332.64 14.44	0.12696 T 0	6.00 15.00 21.00	2.666 0.000 2.666
13 14	8.00 8.00 SCHEI	11.00 11.00 D 40 WET S	44.28 47.19 TEEL	30.64 34.80	3.00 3.068 120	44.28 376.92 16.36	0.15999 T 0	11.00 15.00 26.00	4.160 0.000 4.160
14 15	8.00 8.00 SCHEI	11.00 11.00 D 40 WET S	47.19 50.20 TEEL	34.80 39.37	3.00 3.068 120	47.19 424.11 18.41	0.19900 T 0	8.00 15.00 23.00	4.577 0.000 4.577

Fire - Fire pReJkEr Hell	Sprinkler Hyd	raulics Calcı	ulation Progra	m	0		R		re Development, Inc. urpose "Light & Ordin" Page 8	pF	Fire - Fire S ReJkEr Hell	Sprinkler Hyd	raulics Calcu	llation Progra	m	0		Ro		urpose "Light & Ordin" Page 9
Fire S	Sprinkle	r Outp	ut Data							F	Fire S	prinkle	r Outp	ut Data						
Overa	all Pipe C	utput [	Data							C	Overal	II Pipe C	Output E	Data (co	nt'd)					
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)		Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
1	Meter 0.00 psi	-3.00 -3.00		52.76 52.76		476.31					22 33	5.60 5.60 SCHED	11.00 11.00 40 WET S	21.69 21.97 TEEL	15.00 15.40	1.25 1.380 120	21.69 21.69 4.65	0.03978 E 0	7.00 3.00 10.00	0.398 0.000 0.398
3 2	Backflo Prev 0.00 psi	-3.00 -3.00		52.76 52.76		474.31				_	55 66	5.60 5.60 SCHED	11.00 11.00 40 WET S	22.22 22.54 TEEL	15.75 16.20	1.25 1.380 120	22.22 22.22 4.77	0.04161 E 0	8.00 3.00 11.00	0.458 0.000 0.458
4 3	0.00 0.00 SCHED	-3.00 -3.00 40 WET S	0.00 0.00 TEEL	51.53 52.76	6.00 6.065 120	0.00 474.31 5.27	0.00886 2E 0	110.00 28.00 138.00	1.222 0.000 1.222		121 77	0.00 8.00 SCHED	11.00 11.00 40 WET S	0.00 33.81 TEEL	16.56 17.86	2.00 2.067 120	0.00 72.66 6.95	0.05207 2T 0	5.00 20.00 25.00	1.302 0.000 1.302
5 4	0.00 0.00	11.00 -3.00 40 WET S	0.00 0.00	45.25 51.53	6.00 6.065 120	0.00 474.31 5.27	0.00886 E	11.00 14.00 25.00	0.221 6.062 6.283	_	122 99	0.00 8.00 SCHED	11.00 11.00 40 WET S	0.00 36.93 TEEL	19.24 21.31	2.00 2.067 120	0.00 130.44 12.47	0.15373 T 0	3.50 10.00 13.50	2.075 0.000 2.075
6 5	0.00 0.00	-3.00 11.00 40 WET S	0.00 0.00	51.22 45.25	6.00 6.065 120	0.00 474.31 5.27	0.00886	11.00 0.00 11.00	0.097 -6.062 -5.965	_	1 100	0.00 0.00 SCHED	-3.00 -3.00 40 WET S	0.00 0.00 TEEL	52.76 52.83	6.00 6.065 120	0.00 476.31 5.29	0.00893  0	8.00 0.00 8.00	0.071 0.000 0.071
7 6	0.00 0.00	11.00 -3.00 40 WET S	0.00 0.00	44.34 51.22	6.00 6.065 120	0.00 474.31 5.27	0.00886 3E 0	50.00 42.00 92.00	0.815 6.062 6.877	_	33 120	5.60 0.00 SCHED	11.00 11.00 40 WET S	21.97 0.00 TEEL	15.40 16.36	1.50 1.610 120	21.97 43.66 6.88	0.06853 T 0	6.00 8.00 14.00	0.959 0.000 0.959
8 7	0.00 0.00	11.00 11.00 40 WET S	0.00 0.00	44.02 44.34	6.00 6.065 120	0.00 474.31 5.27	0.00886 T 0	5.50 30.00 35.50	0.314 0.000 0.314		120 44	0.00 8.00 SCHED	11.00 11.00 40 WET S	0.00 32.35 TEEL	16.36 16.35	2.00 2.067 120	4.45 4.45 0.43	0.00030 2T 0	5.00 20.00 25.00	0.007 0.000 0.007
15 8	8.00 0.00 SCHED	11.00 11.00 40 WET S	50.20 0.00 TEEL	39.37 44.02	3.00 3.068 120	50.20 474.31 20.58	0.24476 T 0	4.00 15.00 19.00	4.651 0.000 4.651	_	44 121	8.00 0.00 SCHED	11.00 11.00 40 WET S	32.35 0.00 TEEL	16.35 16.56	2.00 2.067 120	27.89 27.89 2.67	0.00886 ET 0	9.00 15.00 24.00	0.213 0.000 0.213
11 120	8.00 0.00 SCHED	11.00 11.00 40 WET S	36.06 0.00 TEEL	20.32 16.36	1.00 1.049 120	0.00 48.12 17.86	0.66066 E 0	4.00 2.00 6.00	3.964 0.000 3.964		66 121	5.60 0.00 SCHED	11.00 11.00 40 WET S	22.54 0.00 TEEL	16.20 16.56	1.50 1.610 120	22.54 44.76 7.05	0.07175 E 0	1.00 4.00 5.00	0.359 0.000 0.359
123 12	0.00 8.00 SCHED	11.00 11.00 40 WET S	0.00 42.31 TEEL	25.70 27.97	3.00 3.068 120	0.00 290.33 12.60	0.09871 T 0	8.00 15.00 23.00	2.270 0.000 2.270	_	77 122	8.00 0.00 SCHED	11.00 11.00 40 WET S	33.81 0.00 TEEL	17.86 19.24	2.00 2.067 120	33.81 106.47 10.18	0.10558 T 0	3.00 10.00 13.00	1.373 0.000 1.373
12 13	8.00 8.00 SCHED	11.00 11.00 40 WET S	42.31 44.28 TEEL	27.97 30.64	3.00 3.068 120	42.31 332.64 14.44	0.12696 T 0	6.00 15.00 21.00	2.666 0.000 2.666		88 122	5.60 0.00 SCHED	11.00 11.00 40 WET S	23.97 0.00 TEEL	18.33 19.24	1.25 1.380 120	23.97 23.97 5.14	0.04788 ET 0	10.00 9.00 19.00	0.910 0.000 0.910
13 14	8.00 8.00	11.00 11.00 40 WET S	44.28 47.19	30.64 34.80	3.00 3.068 120	44.28 376.92 16.36	0.15999 T 0	11.00 15.00 26.00	4.160 0.000 4.160	_	10 123	8.00 0.00 SCHED	11.00 11.00 40 WET S	38.77 0.00 TEEL	23.49 25.70	1.25 1.380 120	38.77 38.77 8.32	0.11652 ET 0	10.00 9.00 19.00	2.214 0.000 2.214
14 15	8.00 8.00 SCHED	11.00 11.00 40 WET S	47.19 50.20 TEEL	34.80 39.37	3.00 3.068 120	47.19 424.11 18.41	0.19900 T 0	8.00 15.00 23.00	4.577 0.000 4.577		11 123	8.00 0.00 SCHED	11.00 11.00 40 WET S	36.06 0.00 TEEL	20.32 25.70	1.25 1.380 120	36.06 84.18 18.06	0.48905 ET 0	2.00 9.00 11.00	5.380 0.000 5.380
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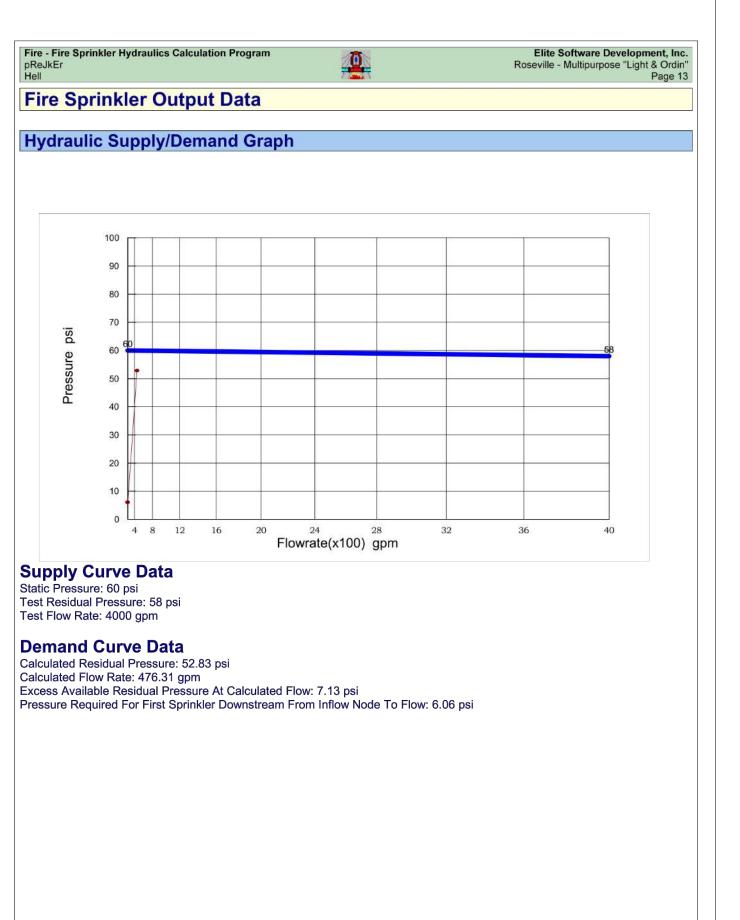
ire S	Sprinkle	er Outn	ut Data		72-8				Page *
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vera	II Pipe (	Output [	Data (coi	nt'd)					
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
99	8.00	11.00	36.93	21.31	2.00	36.93	0.24382	8.00	4.389
123	0.00 SCHEI	11.00 D 40 WET S	0.00 TEEL	25.70	2.067 120	167.37 16.00	T 0	10.00 18.00	0.000 4.389

ReJkEr ell					Roseville - M	Iultipurpose "Light 8
ire Sprinkler Ou	tput Data					
Overall Sprinkler C	utput Data					
Flowing Area Croup		Sprinkler	Residual		Flowing	Sprinkler
Sprinkler Area Group	Sprinkler	Elevation	Pressure	Flowing Area	Density	Discharge
Node No.	KFactor (K)	(feet)	(psi)	(ft²)	(gpm/ft²)	(gpm)
			W/		(3)	(5)
10	8.00	11.00	23.49	113.00	0,343	38.77
ub Totals For Non-Group				113.00	0.343	38.77
11	8.00	11.00	20.32	113.00	0.319	36.06
ub Totals For Non-Group	0.00	11.00	20.32	113.00	0.319	36.06
ab rotato rot rteri Group				110.00	0.010	00.00
12	8.00	11.00	27.97	113.00	0.374	42.31
ub Totals For Non-Group				113.00	0.374	42.31
13	8.00	11.00	20.64	113.00	0.392	44.00
ub Totals For Non-Group	0.00	11.00	30.64	113.00	0.392	44.28 44.28
ub rotals ror non croup				110.00	0.002	44.20
14	8.00	11.00	34.80	113.00	0.418	47.19
ub Totals For Non-Group				113.00	0.418	47.19
45	9.00	11.00	20.27	112.00	0.444	E0 20
15 ub Totals For Non-Group	8.00	11.00	39.37	113.00 113.00	0.444 0.444	50.20 50.20
ub Totals For Non-Group				113.00	0.444	30.20
22	5.60	11.00	15.00	113.00	0.192	21.69
ub Totals For Non-Group				113.00	0.192	21.69
33	5,60	11.00	15.40	113.00	0.194	24.07
ub Totals For Non-Group	5,00	11.00	15.40	113.00	0.194	21.97 21.97
ab Totalo For Horr Group				110.00	0.101	21.01
44	8.00	11.00	16.35	113.00	0.286	32.35
ub Totals For Non-Group				113.00	0.286	32.35
55	5.60	11.00	15.75	113.00	0.197	22.22
ub Totals For Non-Group	5.00	11.00	15.75	113.00	0.197	22.22
as retails represent disciplination					0	
66	5.60	11.00	16.20	113.00	0.199	22.54
ub Totals For Non-Group				113.00	0.199	22.54
77	8.00	11.00	17.86	113.00	0.299	33.81
ub Totals For Non-Group	0.00	11.00	17.00	113.00	0.299	33.81
				. 10.00	3.203	55.51
88	5.60	11.00	18.33	113.00	0.212	23.97
ub Totals For Non-Group				113.00	0.212	23.97
99	8.00	11.00	21.31	113.00	0.327	36.93
ub Totals For Non-Group	0.00	11.00	21.01	113.00	0.327	36.93
·						
otals For All Groups				1582.00	0.300	474.31

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lell		Elite Software Development, In Roseville - Multipurpose "Light & Ordi Page '
Fire Sprinkler Output Summary		
Hydraulically Most Demanding Sprin	kler Node	
IMD Sprinkler Node Number: IMD Actual Residual Pressure:	22 15.00 psi	
IMD Actual GPM:	21.69 gpm	
Sprinkler Summary		
Sprinkler System Type:	Wet	
Specified Area Of Application:	1500.00 ft²	
Minimum Desired Density: Application Average Density:	0.070 gpm/ft² 0.316 gpm/ft²	
Application Average Bensity. Application Average Area Per Sprinkler:	107.14 ft <sup>2</sup>	
Sprinkler Flow:	474.31 gpm	
verage Sprinkler Flow:	33.88 gpm	
Flow Velocity And Imbalance Summa	ary	
Maximum Flow Velocity ( In Pipe 8 - 15 )	20.58 ft/sec	
Maximum Velocity Pressure ( In Pipe 8 - 15 )	2.85 psi	
Illowable Maximum Nodal Pressure Imbalance:	0.0000 psi	
actual Maximum Nodal Pressure Imbalance:	0.0000 psi	
actual Average Nodal Pressure Imbalance:	0.0000 psi	
ctual Maximum Nodal Flow Imbalance:	0.0000 gpm	
actual Average Nodal Flow Imbalance:	0.0000 gpm	
Overall Network Summary		
lumber Of Unique Pipe Sections:	27	
lumber Of Flowing Sprinklers:	14	
ipe System Water Volume:	317.25 gal	
Sprinkler Flow:	474.31 gpm	
Ion-Sprinkler Flow:	2.00 gpm	
Minimum Required Residual Pressure At System Inflow lode:	52.83 psi	
Demand Flow At System Inflow Node:	476.31 gpm	

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NO. DATE DESCRIPTION

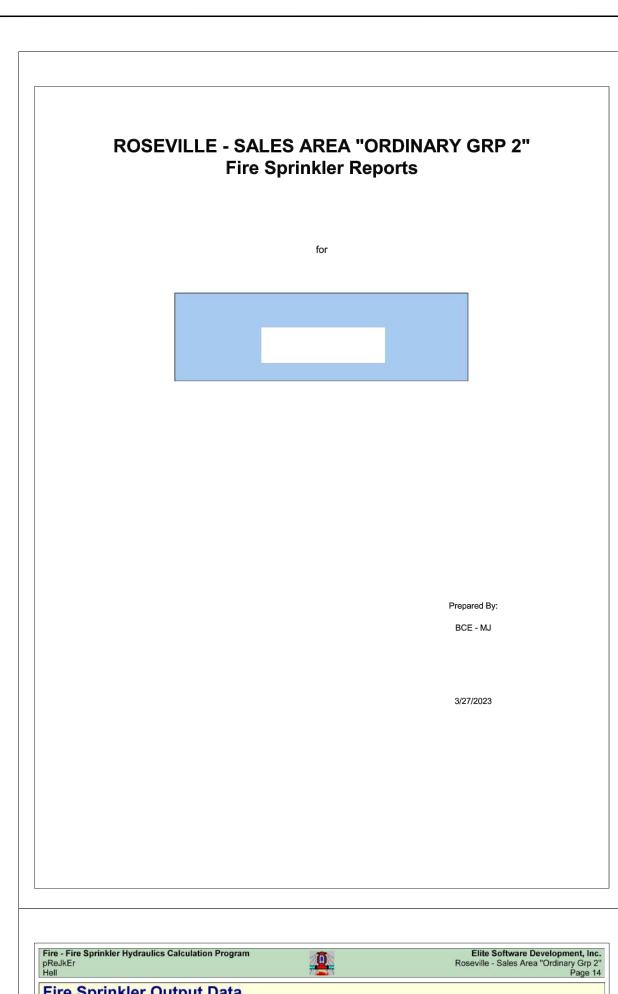
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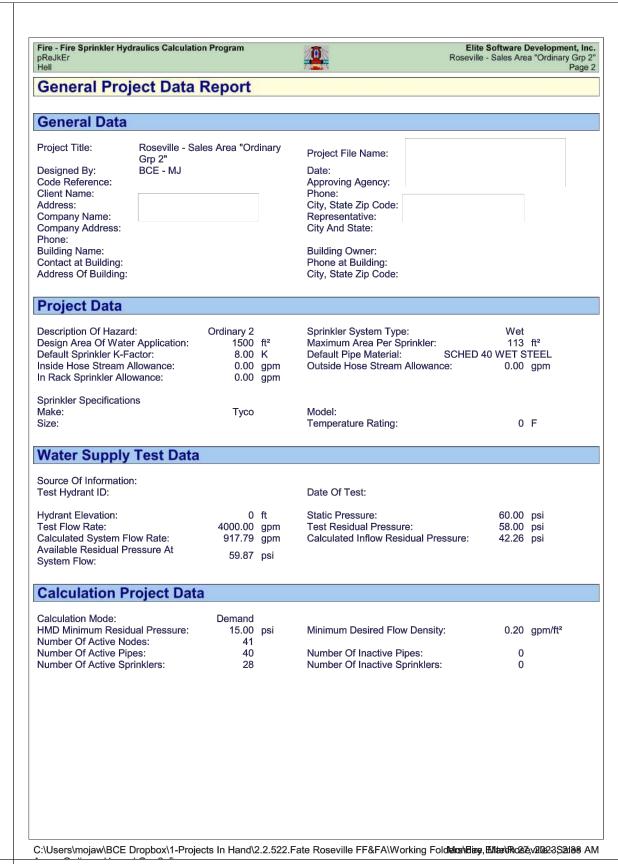
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DESIGNED BY: CHECKED BY: DRAWN BY: DRAWING TITLE:

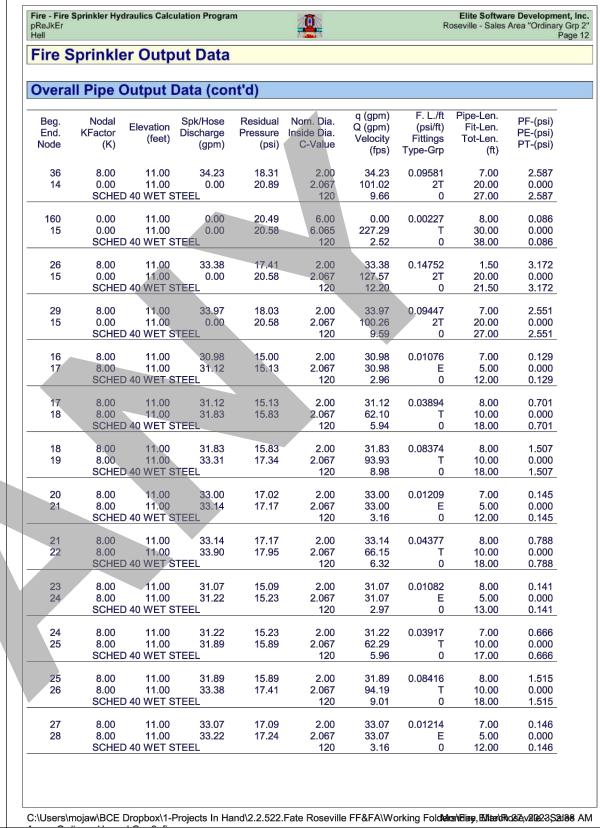
FIRE PROTECTION MULTIPURPOSE AREA HYDRAULIC REPORT

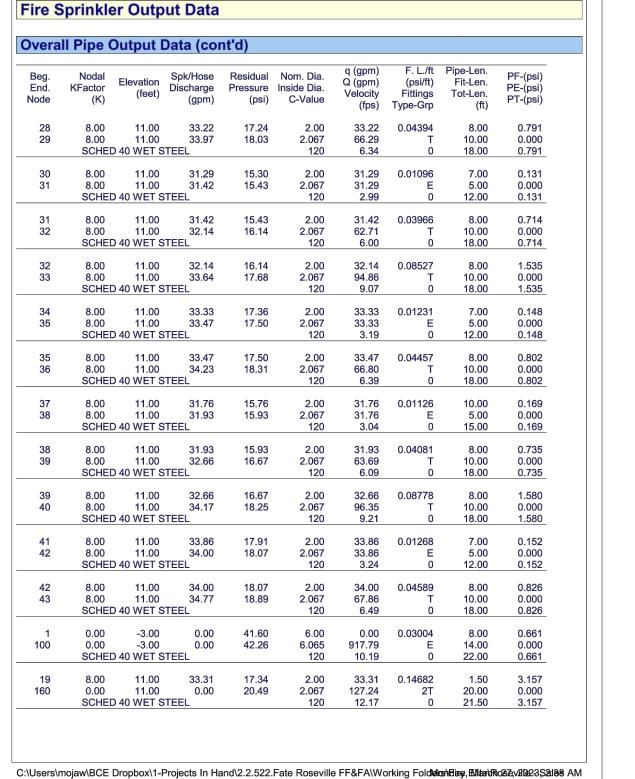
SHEET NO:





ire S	prinkle	er Outp	ut Data							
W-10-11-11-11-11-11-11-11-11-11-11-11-11-										
vera	II Pipe (	Output I	Data							
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)	
2 1	Meter 1.00 psi	-3.00 -3.00		40.59 41.60		917.79				
3	Backflo Prev	-3.00		39.59		917.79				
2	1.00 psi	-3.00		40.59						
4 3	0.00 0.00 SCHEI	-3.00 -3.00 D 40 WET S	0.00 0.00 STEEL	35.14 39.59	6.00 6.065 120	0.00 917.79 10.19	0.03004 2E 0	120.00 28.00 148.00	4.446 0.000 4.446	
5 4	0.00 0.00 SCHEI	11.00 -3.00 D 40 WET S	0.00 0.00 STEEL	28.75 35.14	6.00 6.065 120	0.00 917.79 10.19	0.03004  0	11.00 0.00 11.00	0.330 6.062 6.392	
6 5	0.00 0.00 SCHEI	-3.00 11.00 D 40 WET S	0.00 0.00 STEEL	33.01 28.75	6.00 6.065 120	0.00 917.79 10.19	0.03004 2ET 0	2.00 58.00 60.00	1.803 -6.062 -4.259	
7 6	0.00 0.00 SCHEI	-3.00 -3.00 D 40 WET S	0.00 0.00 STEEL	30.67 33.01	6.00 6.065 120	0.00 917.79 10.19	0.03004 2E 0	50.00 28.00 78.00	2.343 0.000 2.343	
8 7	0.00 0.00 SCHEI	11.00 -3.00 D 40 WET S	0.00 0.00 STEEL	23.60 30.67	6.00 6.065 120	0.00 917.79 10.19	0.03004 2E 0	5.50 28.00 33.50	1.006 6.062 7.068	
13 8	0.00 0.00 SCHEI	11.00 11.00 D 40 WET S	0.00 0.00 STEEL	21.56 23.60	6.00 6.065 120	0.00 917.79 10.19	0.03004 2T 0	8.00 60.00 68.00	2.043 0.000 2.043	
14 13	0.00 0.00 SCHEI	11.00 11.00 D 40 WET S	0.00 0.00 STEEL	20.89 21.56	6.00 6.065 120	0.00 684.63 7.60	0.01747 T 0	8.00 30.00 38.00	0.664 0.000 0.664	1
40 13	8.00 0.00 SCHEI	11.00 11.00 D 40 WET S	34.17 0.00 STEEL	18.25 21.56	2.00 2.067 120	34.17 130.53 12.48	0.15392 2T 0	1.50 20.00 21.50	3.309 0.000 3.309	
43 13	8.00 0.00 SCHEI	11.00 11.00 D 40 WET S	34.77 0.00 STEEL	18.89 21.56	2.00 2.067 120	34.77 102.64 9.81	0.09866 2T 0	7.00 20.00 27.00	2.664 0.000 2.664	
15 14	0.00 0.00 SCHEI	11.00 11.00 D 40 WET S	0.00 0.00 STEEL	20.58 20.89	6.00 6.065 120	0.00 455.11 5.05	0.00821 T 0	8.00 30.00 38.00	0.312 0.000 0.312	
33 14	8.00 0.00 SCHEI	11.00 11.00 D 40 WET S	33.64 0.00 STEEL	17.68 20.89	2.00 2.067 120	33.64 128.49 12.29	0.14951 2T 0	1.50 20.00 21.50	3.214 0.000 3.214	





Fire - Fire Sprinkler Hydraulics Calculation Program

Elite Software Development, Inc.

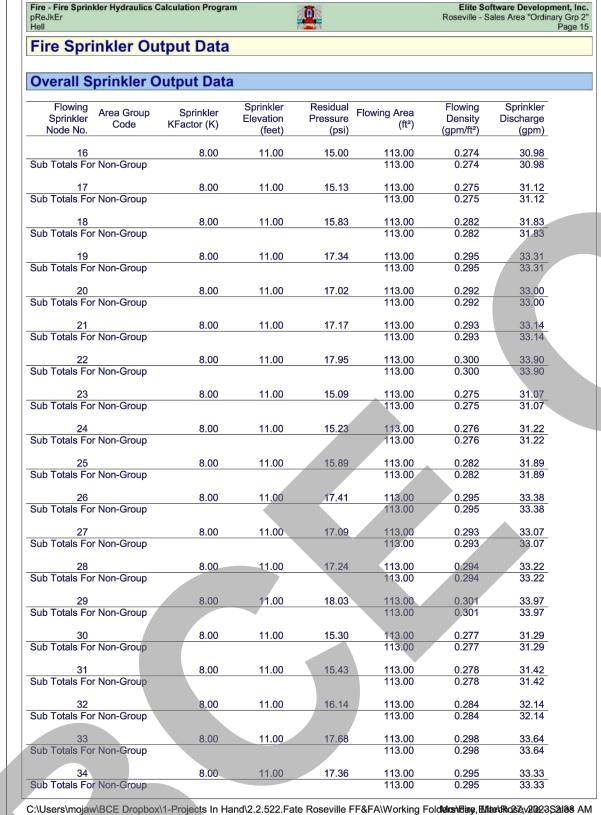
Roseville - Sales Area "Ordinary Grp

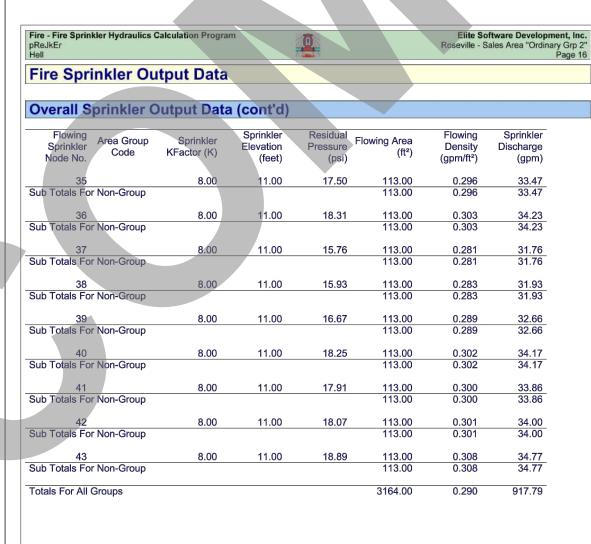
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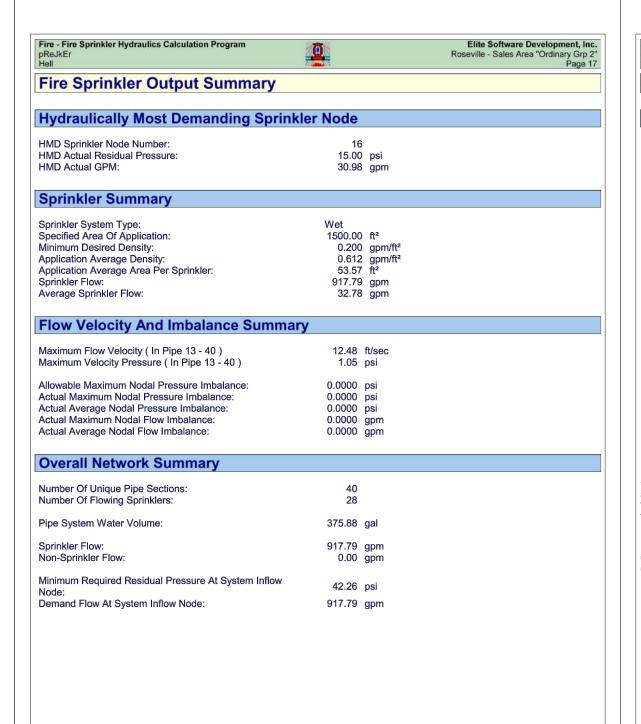
NO. DATE DESCRIPTION

Fire Sprinkler Output Data Overall Pipe Output Data (cont'd) q (gpm) Q (gpm) Velocity (fps) Spk/Hose Residual Nom. Dia. (psi/ft) Fit-Len. Fittings Tot-Len. Elevation KFactor Discharge Pressure Inside Dia. (feet) 33.90 17.95 2.00 33.90 0.09410 7.00 2T 20.00 0.000 0 27.00 2.541 0.00 11.00 0.00 20.49 2.067 100.05 20.00 0.000 SCHED 40 WET STEEL 9.57

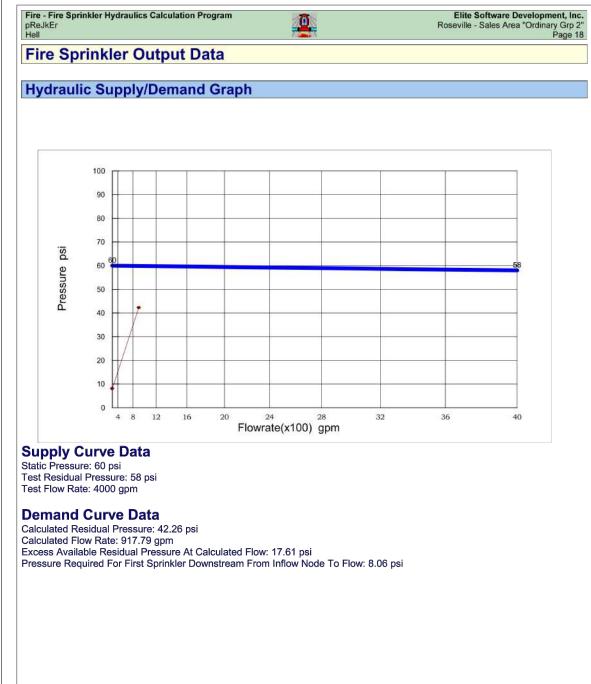
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DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

DATE:

03/2023

DRAWING TITLE:

FIRE PROTECTION
SALES AREA
HYDRAULIC REPORT

SHEET NO:

F 4.04

### ROSEVILLE - WI-C/F "LIGHT HAZARD" DRY Fire Sprinkler Reports

BCE - MJ

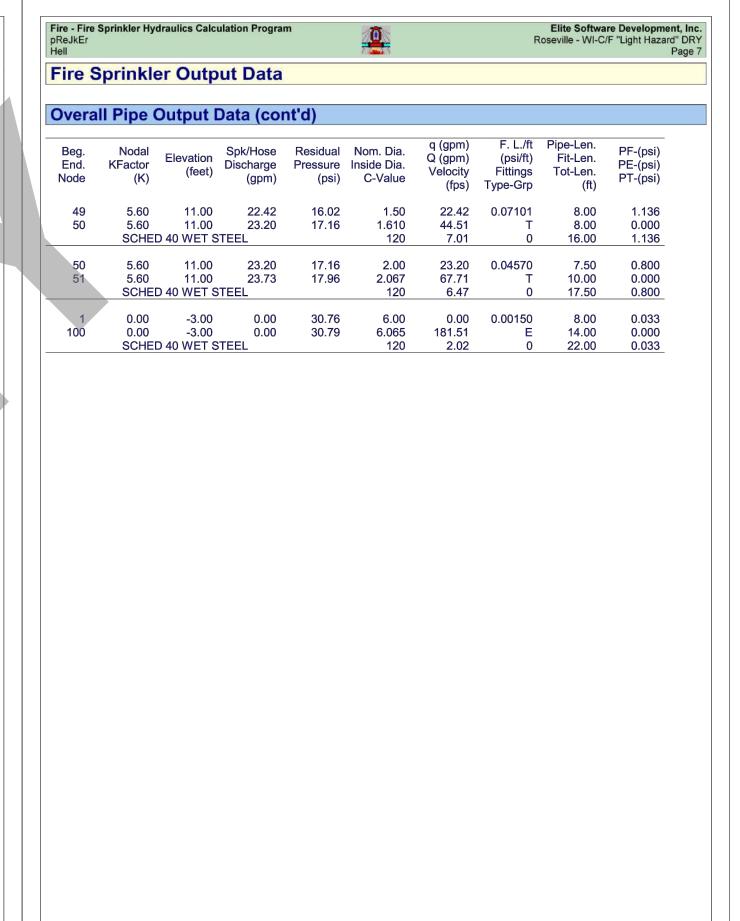
3/27/2023

Fire - Fire Sprinkler Hydraulics Calculat pReJkEr Hell	ion Program		<u> </u>			Development, Light Hazard" I Pa
General Project Data	Report					
General Data						
Project Title:  Designed By: Code Reference: Client Name: Address: Company Name: Company Address: Phone: Building Name: Contact at Building: Address Of Building:			Project File Name: Date: Approving Agency: Phone: City, State Zip Code: Representative: City And State: Building Owner: Phone at Building: City, State Zip Code:	Roseville - WI.0 3/27/2023	C.F- Light H	azardfiw
Project Data						
Description Of Hazard: Design Area Of Water Application: Default Sprinkler K-Factor: Inside Hose Stream Allowance: In Rack Sprinkler Allowance:	Light Hazard 1500 5.60 0.00 0.00	K gpm	Sprinkler System Typ Maximum Area Per S Default Pipe Material: Outside Hose Stream	prinkler: SCHED	Dry 113 40 WET S 0.00	
Sprinkler Specifications Make: Size:	Тусо		Model: Temperature Rating:		0	F
Water Supply Test Data	a					
Source Of Information: Test Hydrant ID:			Date Of Test:			
Hydrant Elevation: Test Flow Rate: Calculated System Flow Rate: Available Residual Pressure At System Flow:	0 4000.00 181.51 59.99	gpm	Static Pressure: Test Residual Pressu Calculated Inflow Res		60.00 58.00 30.79	psi
Calculation Project Dat	a					
Calculation Mode: HMD Minimum Residual Pressure: Number Of Active Nodes: Number Of Active Pipes: Number Of Active Sprinklers:	Demand 15.00 17 16 8	psi	Minimum Desired Floo Number Of Inactive P Number Of Inactive S	ipes:	0.07 0 0	gpm/ft²

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Fire - Fire pReJkEr Hell	Sprinkler Hy	draulics Calcı	ılation Progra	m	<u> 0</u>		R	Elite Softwa loseville - WI-C		
Inches in the Indiana	Sprinkle	er Outp	ut Data		1999 <del></del>					750
Overa	II Pipe (	Output [	Data							
Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)	
2 1	Meter 1.00 psi	-3.00 -3.00		29.76 30.76		181.51				
3 2	Backflo Prev 1.00 psi	-3.00 -3.00		28.76 29.76		181.51	•			
4 3	0.00 0.00 SCHEI	-3.00 -3.00 D 40 WET S	0.00 0.00 TEEL	28.53 28.76	6.00 6.065 120	0.00 181.51 2.02	0.00150 2E 0	120.00 28.00 148.00	0.222 0.000 0.222	
5 4	0.00 0.00 SCHEI	11.00 -3.00 D 40 WET S	0.00 0.00 TEEL	22.46 28.53	6.00 6.065 120	0.00 181.51 2.02	0.00150	11.00 0.00 11.00	0.016 6.062 6.078	
17 5	0.00 0.00 SCHEI	-3.00 11.00 D 40 WET S	0.00 0.00 TEEL	27.44 22.46	3.00 3.068 120	0.00 181.51 7.88	0.04140 T 0	11.00 15.00 26.00	1.076 -6.062 -4.986	
18 17	0.00 0.00 SCHEI	11.00 -3.00 D 40 WET S	0.00 0.00 TEEL	19.68 27.44	3.00 3.068 120	0.00 181.51 7.88	0.04140 3E 0	20.00 21.00 41.00	1.697 6.062 7.759	-
19 18	0.00 0.00 SCHEI	11.00 11.00 D 40 WET S	0.00 0.00 TEEL	18.83 19.68	3.00 3.068 120	0.00 181.51 7.88	0.04140 T 0	5.50 15.00 20.50	0.849 0.000 0.849	_
47 19	5.60 0.00 SCHEI	11.00 11.00 D 40 WET S	23.41 0.00 TEEL	17.48 18.83	2,00 2.067 120	23.41 90.07 8.61	0.07748 T 0	7.50 10.00 17.50	1.356 0.000 1.356	
51 19	5.60 0.00 SCHEI	11.00 11.00 0 40 WET S	23.73 0.00 TEEL	17.96 18.83	2.00 2.067 120	23.73 91.44 8.74	0.07967 T 0	1.00 10.00 11.00	0.876 0.000 0.876	
44 45	5.60 5.60 SCHE	11.00 11.00 0 40 WET S	21.69 22.10 TEEL	15.00 15.58	1.25 1.380 120	21.69 21.69 4.65	0.03978 2E 0	8.50 6.00 14.50	0.577 0.000 0.577	-
45 46	5.60 5.60 SCHEI	11.00 11.00 0 40 WET S	22.10 22.87 TEEL	15.58 16.68	1.50 1.610 120	22.10 43.79 6.90	0.06890 T 0	8.00 8.00 16.00	1.102 0.000 1.102	-
46 47	5.60 5.60 SCHEI	11.00 11.00 0 40 WET S	22.87 23.41 TEEL	16.68 17.48	2.00 2.067 120	22.87 66.66 6.37	0.04440 T 0	8.00 10.00 18.00	0.799 0.000 0.799	-
48 49	5.60 5.60	11.00 11.00 0 40 WET S	22.10 22.42	15.57 16.02	1.25 1.380 120	22.10 22.10 4.74	0.04117 E 0	8.00 3.00 11.00	0.453 0.000 0.453	

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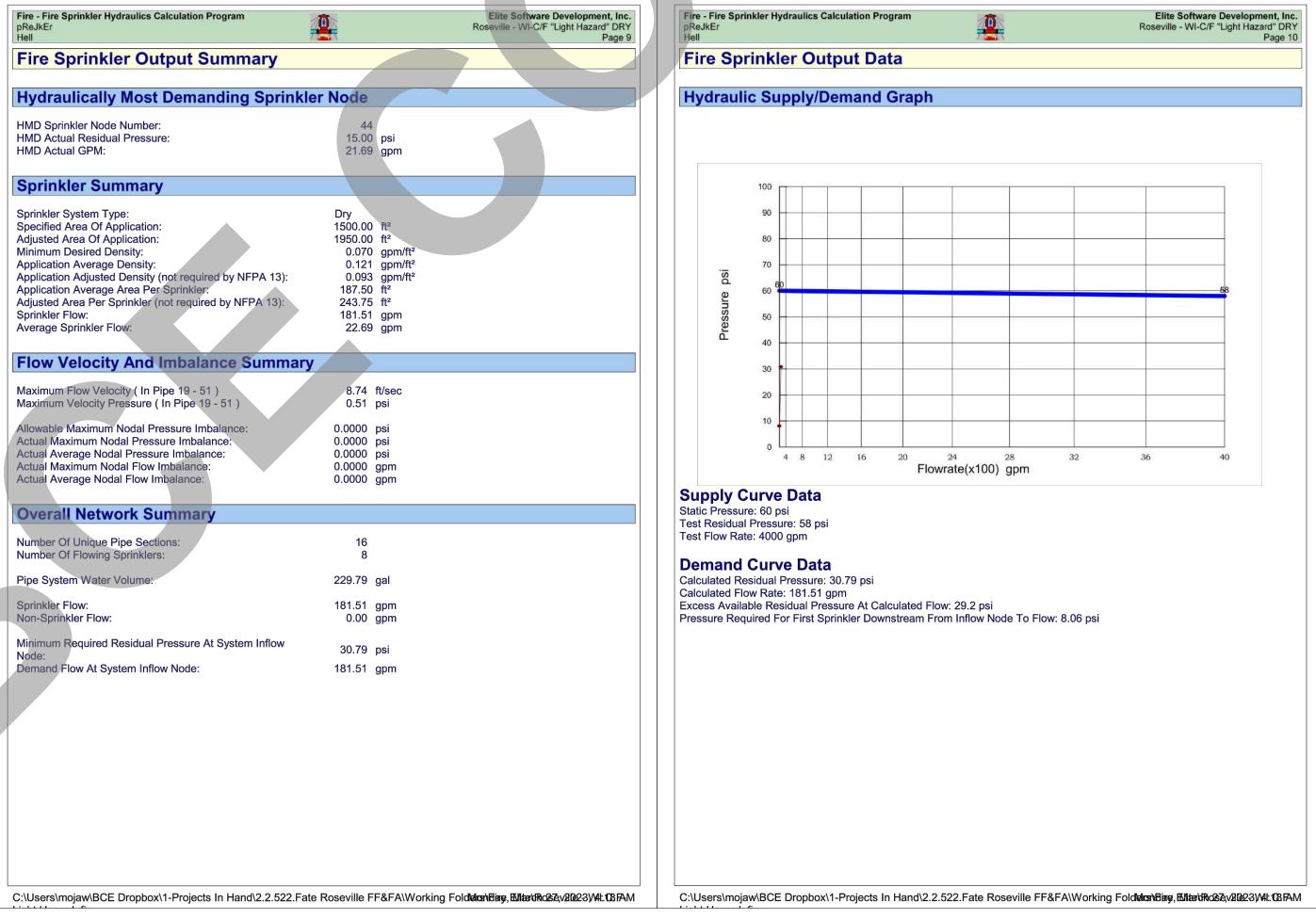


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<b>Fire - Fire Sprinkler Hydra</b> u pReJkEr Hell	lics Calculation Progra	n	0			ftware Developmen VI-C/F "Light Hazard" P
Fire Sprinkler	Output Data					
Overall Sprinkle	er Output Data					
Flowing Sprinkler Node No.		Sprinkler Elevation (feet)	Residual Pressure (psi)	Flowing Area (ft²)	Flowing Density (gpm/ft²)	Sprinkler Discharge (gpm)
44 Sub Totals For Non-Gro	5.60	11.00	15.00	113.00 113.00	0.192 0.192	21.69 21.69
Sub Totals For Non-Gro	up 5.60	11.00	15.58	113.00	0.192	21.69
Sub Totals For Non-Gro	up			113.00	0.196	22.10
46 Sub Totals For Non-Gro	5.60 up	11.00	16.68	113.00 113.00	0.202 0.202	22.87 22.87
47 Sub Totals For Non-Gro	5.60	11.00	17.48	113.00 113.00	0.207 0.207	23.41 23.41
48	5.60	11.00	15.57	113.00	0.196	22.10
Sub Totals For Non-Gro				113.00	0.196	22.10
49 Sub Totals For Non-Gro	5.60 up	11.00	16.02	113.00 113.00	0.198 0.198	22.42 22.42
50	5.60	11.00	17.16	113.00 113.00	0.205 0.205	23.20 23.20
Sub Totals For Non-Gro	up 5.60	11.00	17.96	113.00	0.205	23.20
Sub Totals For Non-Gro		11.00	17.90	113.00	0.210	23.73
Totals For All Groups				904.00	0.201	181.51

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Fire - Fire Sprinkler Hydraulics Calculation Program pReJkEr Hell	<u> </u>	Elite Software Developmer Roseville - WI-C/F "Light Hazard
Fire Sprinkler Output Summary		
Hydraulically Most Demanding Sprinkle	er Node	
HMD Sprinkler Node Number:	44	
HMD Actual Residual Pressure: HMD Actual GPM:	15.00 psi	
HIMD Actual GPM:	21.69 gpm	
Sprinkler Summary		
Sprinkler System Type:	Dry	
Specified Area Of Application:	1500.00 ft²	
Adjusted Area Of Application:	1950.00 ft <sup>2</sup>	
Minimum Desired Density:	0.070 gpm/ft²	
Application Average Density:	0.121 gpm/ft <sup>2</sup>	
Application Adjusted Density (not required by NFPA 13):	0.093 gpm/ft²	
Application Average Area Per Sprinkler:	187.50 ft <sup>2</sup>	
Adjusted Area Per Sprinkler (not required by NFPA 13):	243.75 ft <sup>2</sup>	
Sprinkler Flow:	181.51 gpm	
Average Sprinkler Flow:	22.69 gpm	
Flow Velocity And Imbalance Summary		
Maximum Flow Velocity (In Pipe 19 - 51)	8.74 ft/sec	
Maximum Velocity Pressure (In Pipe 19 - 51)	0.51 psi	
Allowable Maximum Nodal Pressure Imbalance:	0.0000 psi	
Actual Maximum Nodal Pressure Imbalance:	0.0000 psi	
Actual Average Nodal Pressure Imbalance:	0.0000 psi	
Actual Maximum Nodal Flow Imbalance:	0.0000 gpm	
Actual Average Nodal Flow Imbalance:	0.0000 gpm	
	0.	
Overall Network Summary		
Number Of Unique Pipe Sections:	16	
Number Of Flowing Sprinklers:	8	
Pipe System Water Volume:	229.79 gal	
Sprinkler Flow:	181.51 gpm	
Non-Sprinkler Flow:	0.00 gpm	
Minimum Required Residual Pressure At System Inflow	30.79 psi	
Node:	•	
Demand Flow At System Inflow Node:	181.51 gpm	



DEVELOPMENT INFORMATION: SITE ADDRESS: DESIGNED BY: CHECKED BY: DRAWN BY: PROJECT NO: DRAWING TITLE: FIRE PROTECTION W.I.C&F HYDRAULIC REPORT SHEET NO:

NO. DATE DESCRIPTION