

- GENERAL NOTES:
1. FIRE ALARM DESIGN AS NFPA 72.
  2. WIRING SHALL BE CLASS A TYPE.
  3. FIRE ALARM BELLS AND MANUAL PULL STATION SHALL BE MOUNTED ON 98.42" AND 42.48" A.F.F.L RESPECTIVELY.
  4. FAULT ISOLATOR MODULES / BOXES SHALL BE USED EVERY 20 ADDRESSABLE DEVICES MAXIMUM.
  5. FIRE ALARM CONTROL PANEL SHALL BE INSTALLED WITH TOP ENDS AT 70.86" ABOVE F.F.L. UNLESS OTHERWISE INDICATED.
  6. SPACES PROTECTED BY AUTOMATIC FIRE SUPPRESSION SYSTEM (FM200 PACKAGE) SHALL BE INTERFACED WITH FIRE PANEL TO PROVIDE FULL SYSTEM INFORMATION INCLUDING (ALARM 1, ALARM 2, GAS RELEASED, SYSTEM ABORTED, SYSTEM TROUBLE) SIGNALS.
  7. SMOKE AND HEAT DETECTORS SHALL BE LEAST 39.37" AWAY FROM AIR-CONDITIONNING FRESH AIR SUPPLY (DIFFUSER, ETC...).
  8. ALL PRE-ACTION AND DELUGE VALVE SHALL BE CONTROLLED, EACH WITH ITS OWN ADDRESS. FOR EXACT LOCATION REFER TO MECHANICAL FIRE FIGHTING DRAWINGS.
  9. ALL ELECTRO-MECHANICAL SHAFTS SHALL BE PROVIDED WITH SMOKE DETECTORS AS PER CODE REQUIREMENTS.
  10. THE OUTGOING & RETURN CIRCUIT CONDUCTORS SHALL NOT BE RUN IN THE SAME CABLE ASSEMBLY, RACEWAY OR ENCLOSURE.
  11. PROVIDE 24 VDC AND / OR 12 VDC (AS PER MANUFACTURER REQUIREMENT'S) POWER 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 ENGINEER.

SYMBOLS	DESCRIPTION
FIRE ALARM:	
	ADDRESSABLE SMOKE DETECTOR.
	ADDRESSABLE HEAT DETECTOR.
	WALL MOUNTED ADDRESSABLE MANUAL CALL POINT.
	WALL MOUNTED FIRE BELL.
	CONTROL MODULE.
	MONITORING MODULE.
	FIRE ALARM CONTROL PANEL

NO.	DATE	DESCRIPTION
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DEVELOPMENT INFORMATION:

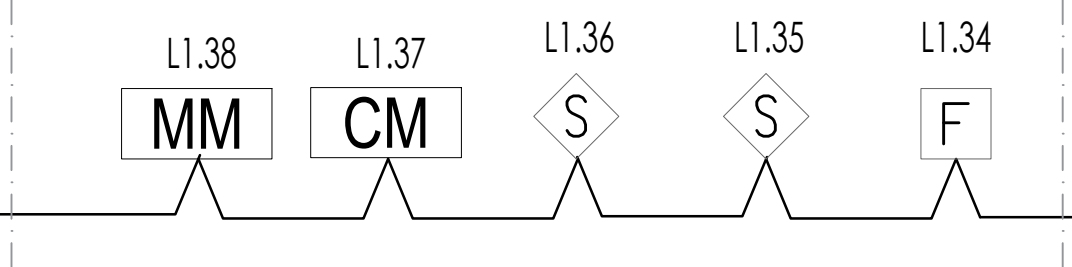
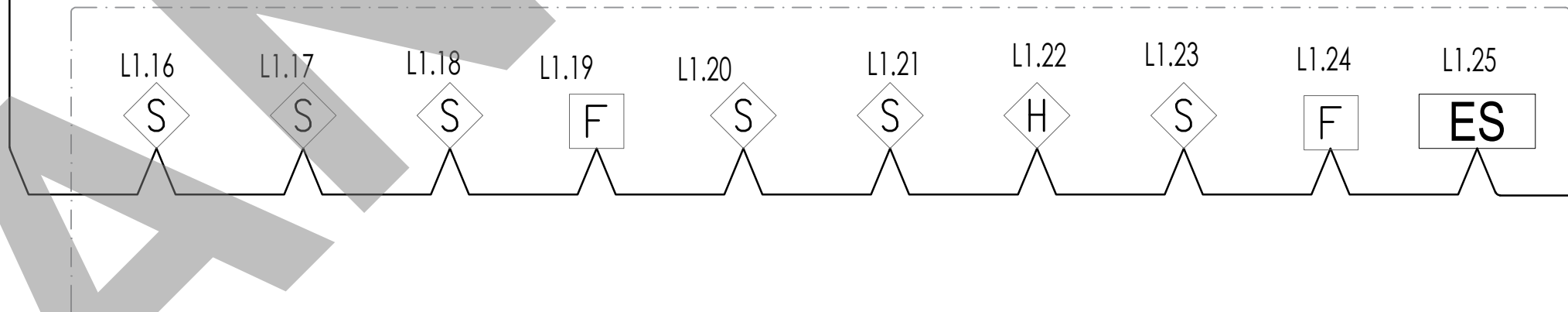
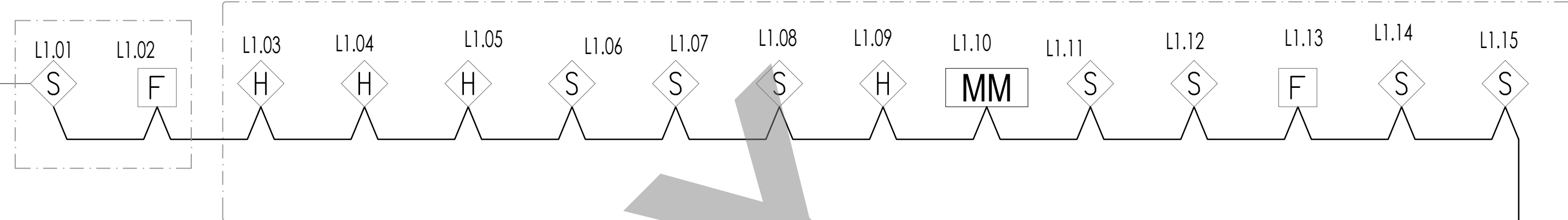
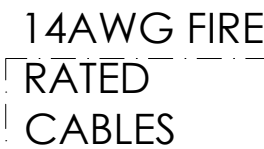
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DESIGNED BY:	
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DRAWN BY:	AB
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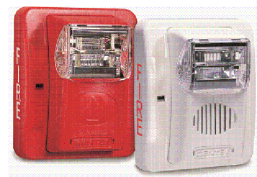
**FIRE ALARM DESIGN  
MARKET AREA &  
CAR WASH**

SHEET NO:

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**GENTEX**  
CORPORATION

# CommandCalc



### Circuit Summary

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DEVELOPMENT INFORMATION

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03/2023	

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**FA - 2.01**





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

TrueAlarm Smoke Detectors

TrueAlarm Photoelectric Smoke Detector  
with TrueSense Smoke/Heat Detection

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

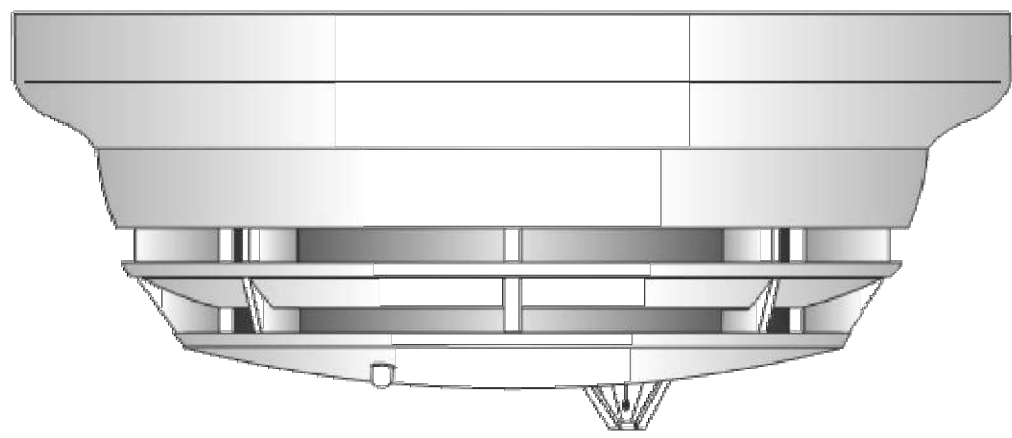
Available options:

- 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

\* 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 7272-0662219 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. Adopted 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.



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), <b>only in effect at temperatures above 90° F (32° C)</b>
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

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

S4098-0017-4 1/2015



UL Listed\*

MX Technology Addressable Devices

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 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

\* Listings under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products.

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DESIGNED BY:	
CHECKED BY:	
DRAWN BY:	AB
DATE:	03/2023
PROJECT NO:	
DRAWING TITLE:	FIRE ALARM CUTSHEET SHEET 1 OF 2
SHEET NO:	





TrueAlert 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:

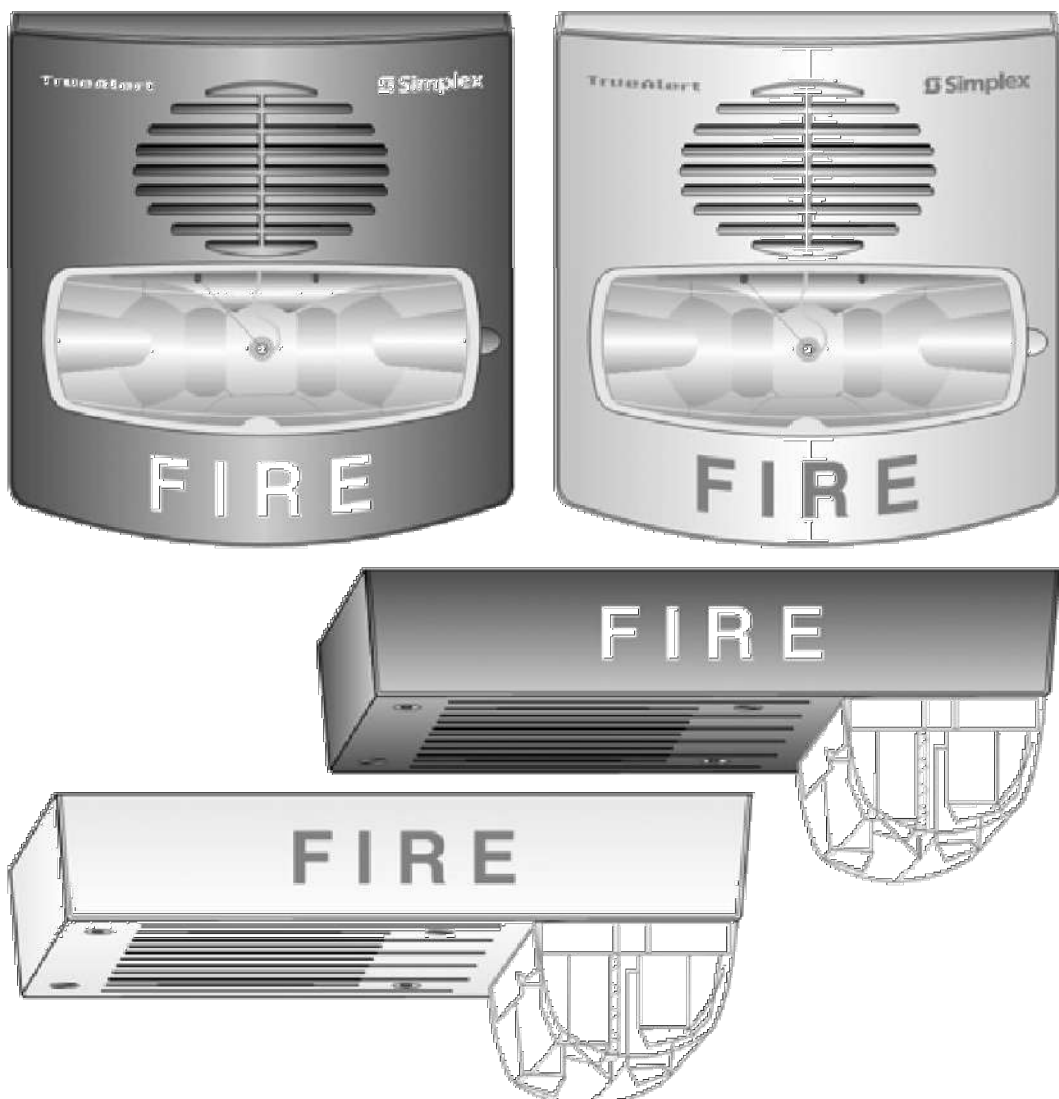
- Wall mount A/V adapters are available to cover surface mounted electrical boxes and to adapt to Simplex® 2975-9145 boxes
- UL listed red wire guards are available for wall or ceiling mount A/Vs

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



TrueAlert Notification Appliances

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

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:

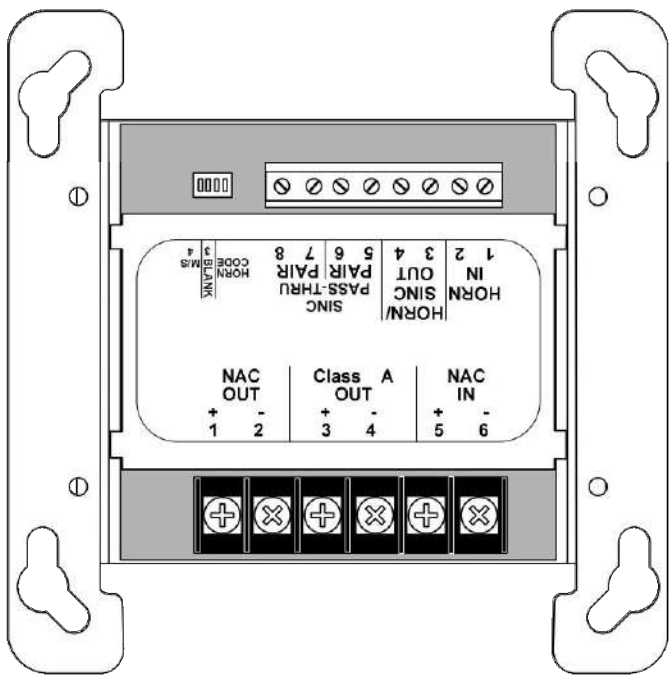
- Operation allows “on-until-silenced” and “on-until-reset” on the same two-wire pair while maintaining supervision continuity
- SmartSync horns sound as Temporal or March Time pattern, or continuous, controlled separately from strobes on the same circuit
- Strobes on the same circuit operate at a synchronized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

Conventional strobe synchronization models:

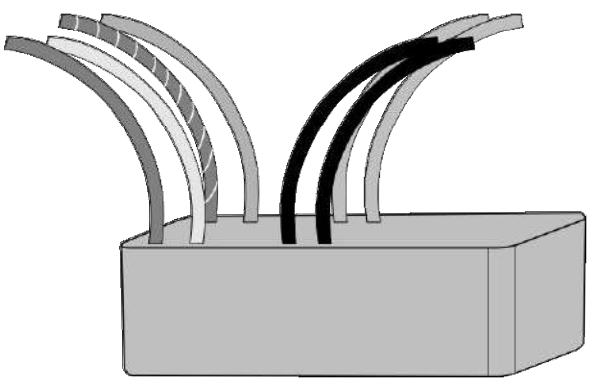
- Encapsulated package with color coded wire leads provides 1 Hz strobe synchronization and maintains supervision continuity
- Conventional horns and other DC appliances operate on the same 2-wire circuit
- Models are available with Class B or Class A output
- Small size allows convenient mounting

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.

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DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

DATE:

PROJECT NO:

DRAWING TITLE:

FIRE ALARM CUTSHEET  
SHEET 2 OF 2

SHEET NO:



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 SUPPORTS
- 7. PIPE AND FITTINGS
- 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 +230°F. 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:

- 1. STANDARD WEIGHT DUCTILE IRON PIPE WITH MECHANICAL "BOLTED TYPE" JOINTS.
- 2. 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.
- 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 ARAKADERO FIRE DEPARTMENT FOR REVIEW AND APROVAL IS REQUIRED BY THE INSTALLING C-16 LISICENSED 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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SEAL:

DEVELOPMENT INFORMATION:

SITE ADDRESS:

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

DRAWING TITLE:

FIRE PROTECTION  
GENERAL NOTES.

SHEET NO:

F 0.01



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 MOTOR
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 27.5.2.2.1 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.

STEEL ORDINARY 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)	20 SPRINKLERS
3" (80mm)	40 SPRINKLERS
3-1/2"(90mm)	65 SPRINKLERS
4" (100mm)	100 SPRINKLERS
5" (125mm)	160 SPRINKLERS
6" (150mm)	275 SPRINKLERS
NFPA 13 TABLE 27.5.3.4 ORDINARY 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.

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 CONDITIONS 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 APPROACHES

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)*

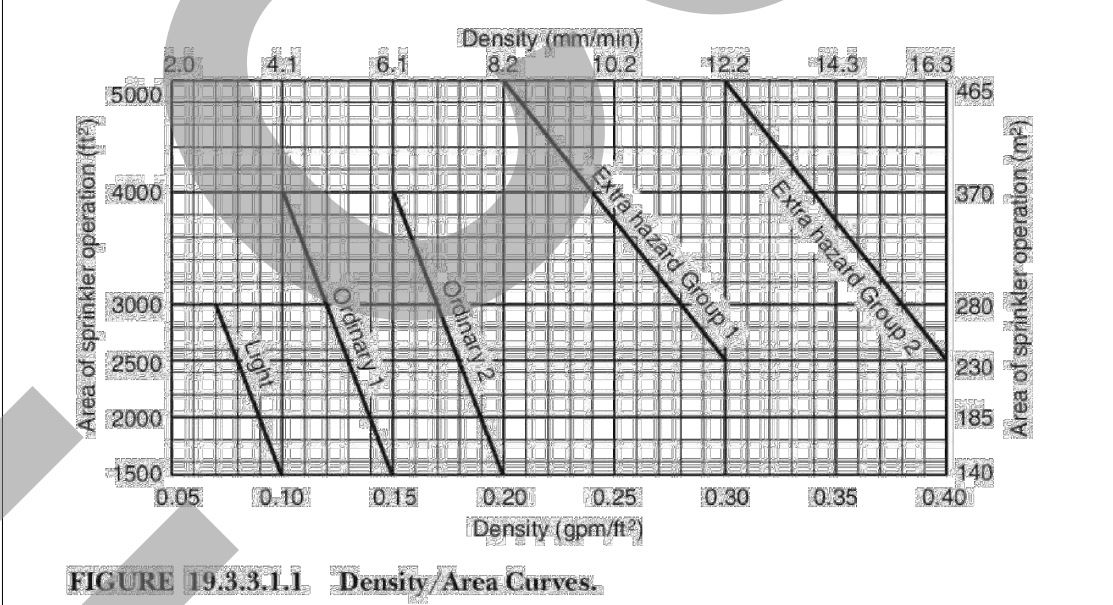
19.3.3 WATER DEMAND REQUIREMENTS - HYDRAULIC CALCULATION METHODS.

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 FIGURE 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 Section 503.1.4.

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 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
PIPELINE TRANSPORTATION SYSTEM FOR LIQUID HYDROCARBONS 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:  
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 durability to withstand the pressure, structural and seismic stress and exposure to which they are 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 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 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.  
9.2.2.1  
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.)

Table 9.2.2.1(a)	NOMINAL PIPE SIZE (in.)											
	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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DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

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DRAWN BY:

DATE:

PROJECT NO:

DRAWING TITLE:

FIRE PROTECTION  
CODE NOTES AND  
ANALYSIS.

SHEET NO:

F 0.02



GENERAL NOTES									
1. SYSTEM DESIGN AND INSTALLATION SHALL COMPLY NFPA 13 2022 AND LOCAL APPLICABLE CODES.									
2. 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									
4. ALL PIPE SHALL BE U.D.N. UNDERGROUND – IPS POLLY PIPE RISER – CPVC OVERHEAD – CPVC									
5. 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.									
6. THE MINIMUM DISTANCE BETWEEN ANY 2 RESIDENTIAL SPRINKLERS ON THIS PRODUCT IS HYDRAULICALLY LIMITED TO 12 FEET. SPRINKLERS SHALL NT EXCEED 6 FEET FROM ANY WALL.									
8. THE MINIMUM 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 NFPA 13.3 6.2 ARE MET.									
10. INSTALLATION OF ALL RESIDENTIAL SPRINKLERS SHALL BE IN STRICT COMPLIANCE WITH THE MANUFACTURERS INSTALLATION GUIDE.									
11. PRIOR TO DRILLING/JOISTS, 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"	HANGER NOTES	
COPPER	8	8	10	10	12	12	12	1. ALL LIGHTING SHOWN ARE THE MAXIMUM RECOMMENDED DISTANCE BETWEEN HANGERS EXPRESSED.	
CPVC	5.5	6	6.5	7	8	9	10	2. PROVIDE A HANGER WITHIN 6 INCHES OF ALL DROPS TO SPRINKLER HEADS WHEN USING CPVC PIPE.	
SCHEDULE 40 &10 STEEL	•	12	12	15	15	15	15	3. + STEEL PIPE IS NOT ALLOWED IN SIZES LESS THAN 1 INCH.	
THREADABLE THINWALL	•	12	12	12	12	12	12		

SYMBOLS AND ABBREVIATIONS			
DESCRIPTION	SYMBOL	ABBREVIATIONS	
NOTE: SPRINKLER SYMBOLS AND ABBREVIATIONS INDICATED IS FOR CONVENIENCE ONLY AND ITEMS INDICATED ARE NOT NECESSARILY WITHIN THE SCOPE OF THE WORK.			
X	NODE NO		
— SO —	FIRE SPRINKLER	A.B.D.	AUTOMATIC BALL DRIP
— SP —	FIRE STANDPIPE PIPING	A.D.	ACCESS DOOR
— D —	SPK DRAIN PIPING	CLG.	CEILING
— C.V. —		C.V.	CHECK VALVE
— D.C.D.A. —	OS & Y VALVE W/ LOCK AND CHAIN	D.C.D.A.	DOUBLE CHECK DETECTOR ASSEMBLY
— W.F.S. —	WATER FLOW SWITCH	DN.	DOWN
— ELEV. —	CAPPED OUTLET	ELEV.	ELEVATION
— G.V. —	GATE VALVE (G.V.)	F.H.C.	FIRE HOSE CABINET
— L.V. —	LOCKSHIELD VALVE (GLOBE VALVE)	F.H.	FIRE HYDRANT
— C.V. —	CHECK VALVE (C.V.)	F.H.R.	FIRE HOSE RACK
— P.R.V. —	PRESSURE REGULATING VALVE	FL.	FLOOR
— S. —	STRAINER	G.V.	GATE VALVE
— H.C. —	SHOCK ABSORBER	H.C.	HUNG CEILING
— P.G. —	PRESSURE GAUGE	N.I.C.	NOT IN CONTRACT
— U.C. —	UNION CONNECTION	O.S.&Y.	OUTSIDE SCREW & YOKE
— P.O. —		P.O.	PLUGGED OUTLET
— T.S. —	DOUBLE CHECK DETECTOR ASSEMBLY	T.S.	TAMPER SWITCH
— W.F.S. —	HOSE VALVE	WFS	WATER FLOW SWITCH
— TS —	HOSE RACK	TS	TAMPER SWITCH
— SPK —	SPRINKLER RIG ASSEMBLY		
— RM —	ROOF MANIFOLD	SPK	SPRINKLER

SPRINKLER HEAD SCHEDULE									
SYMBOL	UPRIGHT	PENDANT	RECESSED (OVERHEAD)	RECESSED (UNDERHEAD)	EXTENDED PENDANT	EXTENDED PENDANT	EXTENDED PENDANT	EXTENDED PENDANT	EXTENDED PENDANT
☀	•	•	•	•	•	•	•	•	•
⊙	•	•	•	•	•	•	•	•	•
⊗	•	•	•	•	•	•	•	•	•
GENERAL LOCATION OF SPRINKLER HEAD									
NOTE: ALL FINISHES ARE SUBJECT TO APPROVAL BY ARCHITECT.									
TYPE/FINISH									
LIGHT HAZARD (OFFICE AREA)									
K=5.5									
PENDING AND RECESSED, STANDARD RESPONSE, STANDARD COVERAGE									
TYCO – SERIES TY-L									
PRIMARY HAZARD GROUP 2 (MERCANTILE)									
K=6.0									
PENDING AND RECESSED, STANDARD RESPONSE, STANDARD COVERAGE									
TYCO – SERIES TY-L									
EXTRA HAZARD (CARWASH)									
K=14.0									
PENDING SPRINKLERS, EARLY SUPPRESSION, FAST RESPONSE									
TYCO – MODEL ESTER-14									

FIRE PROTECTION MATERIAL SCHEDULE																				
SYSTEM		PIPE				FITTINGS		JOINTS												
		REQUIRED	DUCTILE IRON	EXTRA HEAVY CAST IRON	CPVC SDR 13.5	STEEL SCHED 30	STEEL SCHED 40	STEEL SCHED 80	BLACK	GALVANIZED	CEMENT LINED	MALLEABLE IRON	CLASS D LINED	BLACK	GALVANIZED	VICTAULIC	DUCTILE IRON	FRIGIDITY-FLANGED	DUCTILE IRON	VICTAULIC
NOTES:																				
1. FOR REQUIRED PRESSURE RATINGS SEE RISER DIAGRAM.																				
2. ALL MATERIALS SELECTED ON THIS SCHEDULE MUST BE APPROVED BY THE LOCAL AUTHORITIES.																				
3. TO BE USED DOWNSTREAM OF SPRINKLER FLOOR CONTROL VALVE.																				
4. TO BE USED ON RISERS AND MAINS.																				
BURIED BUILDING FIRE SERVICE			●								●			●						●
SPRINKLER (SEE NOTE 3)				●	●												●	●	●	
SPRINKLER (SEE NOTE 4)				●	●												●	●	●	
SPRINKLER DRAIN PIPE				●												●		●	●	
FIRE STANDPIPE						●						●					●	●	●	

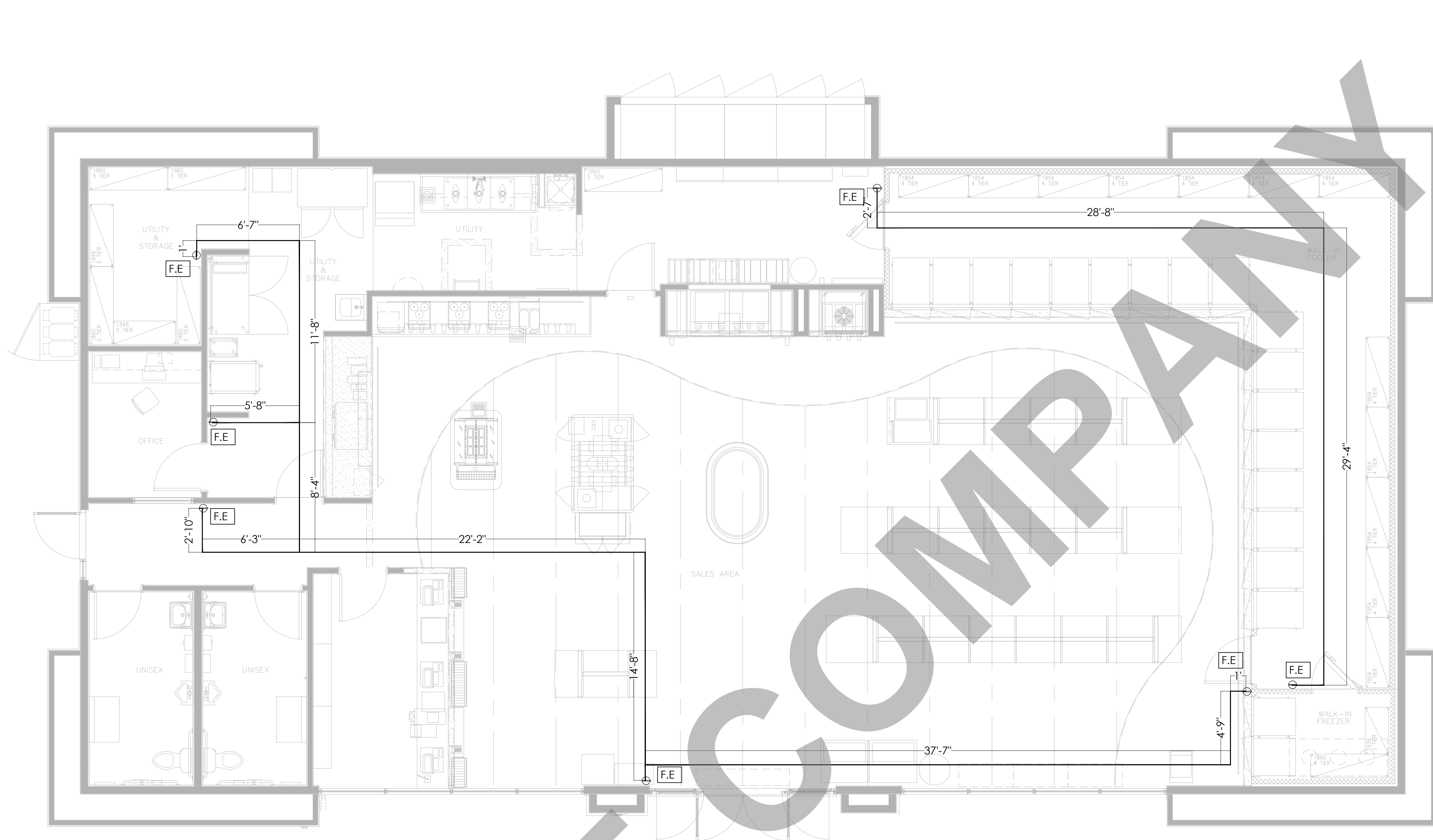








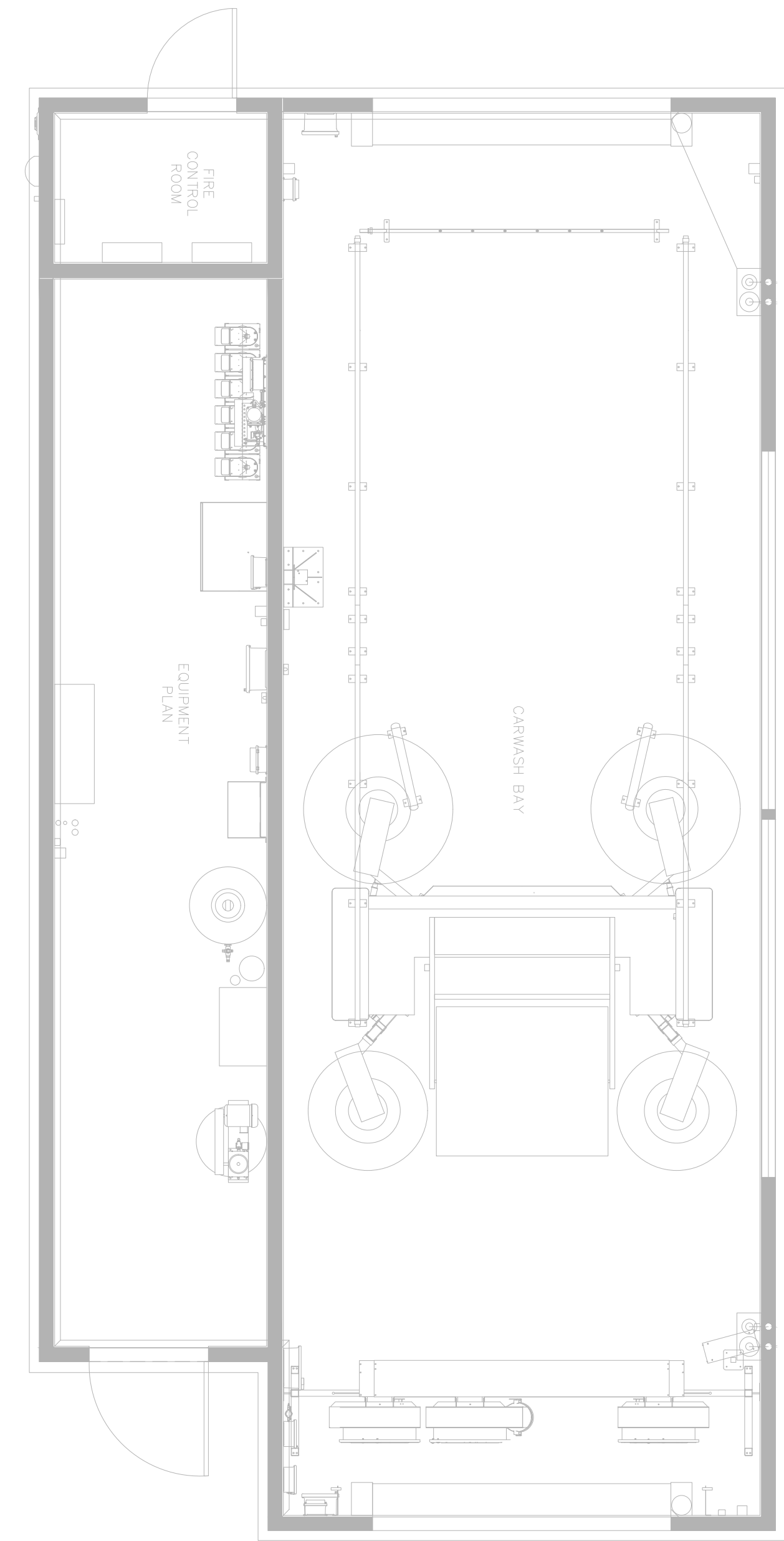




All fire extinguisher are minimum of a 2A-20B:C fire extinguisher

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.



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SEAL:

DEVELOPMENT INFORMATION:

SITE ADDRESS:

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

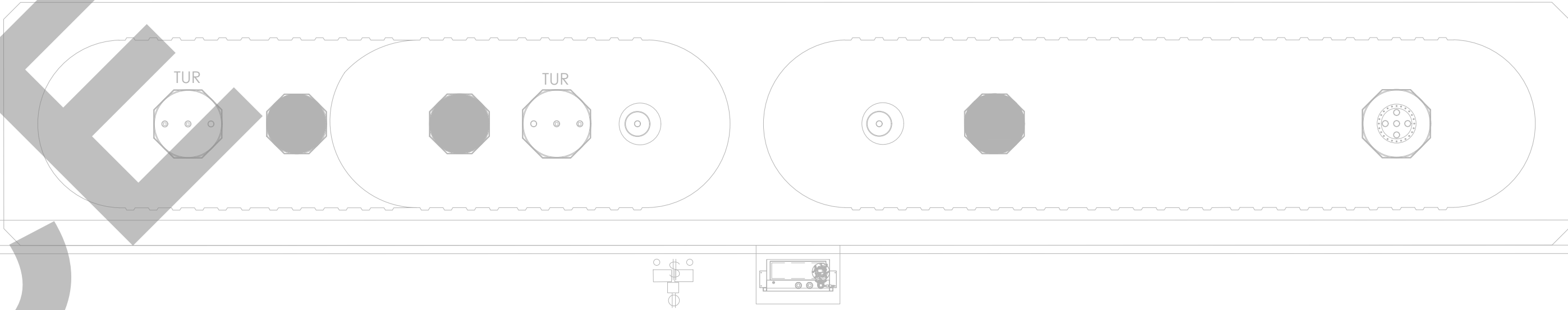
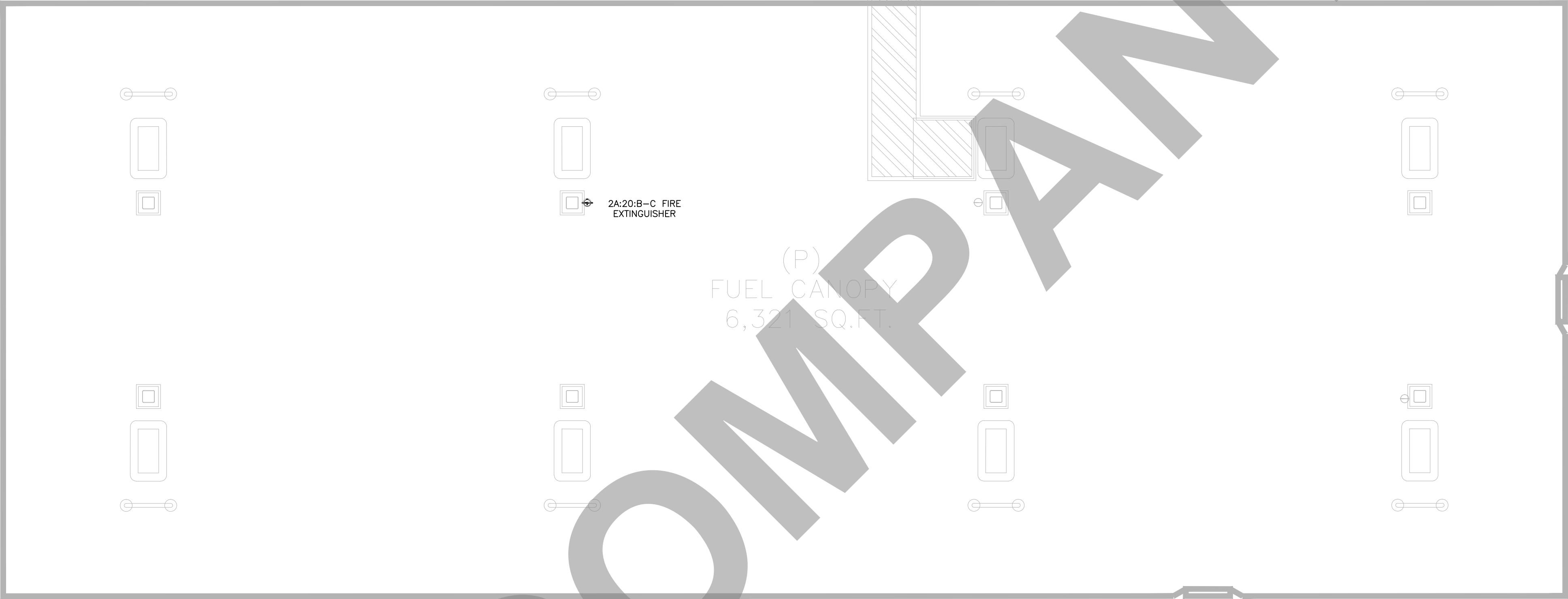
DRAWING TITLE:  
**FIRE PROTECTION  
FIRE EXTINGUISHERS  
LAYOUT.**

SHEET NO:

**F 2.01**



CFC-2022 - 5706.4.10.1 PORTABLE FIRE EXTINGUISHERS:  
PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 20-B  
AND COMPLYING WITH SECTION 906 SHALL BE LOCATED WITH 75 FT  
(22.860mm) OF HOSE CONNECTIONS, PUMPS AND SEPARATOR TANKS



BLUE OAKS BLVD.

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SEAL:

DEVELOPMENT INFORMATION:

SITE ADDRESS:

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

DRAWING TITLE:  
**FIRE PROTECTION  
CANOPY AREA**

SHEET NO:

**F 2.02**















## for



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SEAL:

DEVELOPMENT INFORMATION:

SITE ADDRESS:

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

# FIRE PROTECTION MULTIPURPOSE AREA HYDRAULIC REPORT

SHEET NO:

## F 4.03



ROSEVILLE - SALES AREA "ORDINARY GRP 2"  
Fire Sprinkler Reports

for

Prepared By:  
BCE - MJ

3/27/2023

Elite Software Development, Inc.  
Roseville - Sales Area "Ordinary Grp 2"  
Page 2

General Project Data Report

General Data

Project Title:  
Roseville - Sales Area "Ordinary Grp 2"  
BCE - MJ

Project File Name:  
Date:  
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:

Project Data

Description Of Hazard:  
Design Area Of Water Application:  
Default Sprinkler K-Factor:  
Inside Hose Stream Allowance:  
In Rack Sprinkler Allowance:

Ordinary 2  
1500 ft<sup>2</sup>  
8.00 K  
0.00 gpm  
0.00 gpm

Sprinkler System Type:  
Maximum Area Per Sprinkler:  
Default Pipe Material:  
Outside Hose Stream Allowance:

Wet  
113 ft<sup>2</sup>  
SCHD 40 WET STEEL  
0.00 gpm

Sprinkler Specifications

Make:  
Size:

Tyco  
0 F

Model:  
Temperature Rating:

Water Supply Test Data

Source Of Information:  
Test Hydrant ID:  
Hydrant Elevation:  
Test Flow Rate:  
Calculated System Flow Rate:  
Available Residual Pressure At System Flow:

0 ft  
4000.00 gpm  
917.79 gpm  
59.87 psi

Date Of Test:  
Static Pressure:  
Test Residual Pressure:  
Calculated Inflow Residual Pressure:

60.00 psi  
58.00 psi  
42.26 psi

Calculation Project Data

Calculation Mode:  
HMD Minimum Residual Pressure:  
Number Of Active Nodes:  
Number Of Active Pipes:  
Number Of Active Sprinklers:

Demand  
15.00 psi  
41  
40  
28

Minimum Desired Flow Density:  
Number Of Inactive Pipes:  
Number Of Inactive Sprinklers:

0.20 gpm/ft<sup>2</sup>  
0  
0

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Elite Software Development, Inc.  
Roseville - Sales Area "Ordinary Grp 2"  
Page 11

Fire Sprinkler Output Data

Overall Pipe Output Data

Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. C-Value	Q (gpm) Q (gpm) Velocity (fps)	F. L/Rt (psi/ft) Fittings Type-Grp	Pipe-Len. Fil-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
1	1.00	-3.00	40.59	41.60		917.79			
2	1.00	-3.00	39.59	40.59		917.79			
3	1.00	-3.00	39.59	40.59		917.79			
4	0.00	-3.00	35.14	6.005	6.005	917.79	2E	28.00	0.000
5	0.00	-3.00	28.75	6.005	6.005	917.79	2E	58.00	0.000
6	0.00	-3.00	33.01	6.005	6.005	917.79	2E	58.00	0.000
7	0.00	-3.00	30.67	6.005	6.005	917.79	2E	58.00	0.000
8	0.00	-3.00	23.60	6.005	6.005	917.79	2E	58.00	0.000
9	0.00	-3.00	30.67	6.005	6.005	917.79	2E	58.00	0.000
10	0.00	-3.00	21.56	6.005	6.005	917.79	2T	60.00	0.000
11	0.00	-3.00	21.56	6.005	6.005	917.79	2T	60.00	0.000
12	0.00	-3.00	20.89	6.005	6.005	917.79	2T	60.00	0.000
13	0.00	-3.00	18.25	2.067	130.53	2T	20.00	0.000	
14	0.00	-3.00	12.48	2.067	130.53	2T	20.00	0.000	
15	0.00	-3.00	34.77	2.067	130.53	2T	20.00	0.000	
16	0.00	-3.00	18.89	2.067	130.53	2T	20.00	0.000	
17	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
18	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
19	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
20	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
21	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
22	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
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24	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
25	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
26	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
27	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
28	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
29	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
30	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
31	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
32	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
33	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
34	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
35	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
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122	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
123	0.00	-3.00	15.83	2.067	130.53	2T	20.00	0.000	
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## for



Prepared By:  
BCE - MJ

3/27/2023

Elite Software Development, Inc.  
Roseville - WI-C/F "Light Hazard" DRY  
Page 2

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Roseville - WI-C/F "Light Hazard" DR  
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Roseville - WI-C/F "Light Hazard" DRY  
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Roseville - WI-C/F "Light Hazard" DRY  
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Roseville - WI-C/F "Light Hazard" DRY  
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SEAL:

DEVELOPMENT INFORMATION:

SITE ADDRESS:

DESIGNED BY:

CHECKED BY:

DRAWN BY:

DATE: \_\_\_\_\_

0.3 / 202.3

DRAWING TITLE

**FIRE PROTECTION  
W.I.C&F HYDRAULIC  
REPORT**

SHEET NO:

## F 4.05