Clarification #: 01

Battle Creek Public Schools Dudley Fire Alarm

Date:	11-11-24	**Bids Due:**	11-14-24 @ 2:00 *Local Time*
From:	ELITE COMPANIES	**Email:**	bids@elite-companies.com

Clarification Details

All Bid Packages: **Bid Proposals Sealed bids due 11/14/24 @ 2:00 pm local time,** will be received at Battle Creek Public Schools Administration Office, located at 3 W. Van Buren Street, Battle Creek, MI 49017 Attn: Facilities Director. No faxed bids will be accepted. Envelopes are to be clearly marked as SEALED BID with Project name and number and Bid Package name and number. Bid Opening Bids will be publicly opened and read aloud 11/14/24 @ 2:15 pm at the Battle Creek Public Schools Administration Office, located at 3 W. Van Buren Street, Battle Creek, MI 49017. Bids received after specified date and time will not be accepted and will be returned unopened. Bids will be accepted as determined to be in the Owner's best interest.

All Bid Packages: Review Clarification #1 issued on 11/11/24 by ELITE Companies. All items changed are to be carried by the applicable scope of work Bid Package base bid. Only the listed below Bid Package Scope of Works have been revised with this Clarification attached for bidders use.

Drawings: Drawing 1.2, move fire pull station as shown on plan. Drawing 1.3, move annunciator panel as shown on plan.

Bid Package 26.1: Re-Issued, Clarification; Added language for salvage and reuse and salvage wire mold in areas noted in the SOW. This Trade carries allowance for painting and patching and is responsible for hire and manage painter.

Attachments:

- Pre-Bid Sign-In Sheet
- Updated Knight-Watch Design Drawings
- Existing Johnson Control Fire Alarm Drawings (For Demolition Reference Only)

End of Clarification

ELITE COMPANIES

Sign-In Sheet

DATE: 11/06/24 @ 3:30 pm

MEETING: Dudley Elementary Fire Alarm

Company	Name	Email
Shouldice Elec Div	w. Isaac Burkwalt	w-burkwalt@shouldicebrothers.com
Knight Watch	Josh Kass	jkass@knightwatch.net

ELITE COMPANIES™

PROJECT BID PACKAGE SCOPE REQUIREMENTS

Project: BCPS Dudley Fire Alarm

Bid Package: 26.1 Electrical RE ISSUED

PART I – TECHNICAL SPECIFICATIONS

The following technical specifications developed by Project Architect / Engineer specifically, totally or in part, apply to this bid package

Design / Bid / Build Fire Alarm and Electrical Support

Include all related drawing notes and specifications indicated within the contract documents.

PART II – WORK INCLUDED

The Scope of Work generally includes, but shall not be limited to the following:

ELITE General Scope & Safety Requirements unless noted otherwise below.

Provide all required design documents, local and state plan review submission, permits and fees associated with approval of the design build fire alarm system.

Provide all electrical demolition required to complete this Bid Package's scope of work, if necessary. Protect existing devices, equipment, and adjacent finishes during demolition.

Furnish and install all support systems/racks/platforms that maybe required and/or shown to carry items installed within this Bid Package. Provide proper engineering and shop drawings for review by A/E.

Furnish and install any blocking, strapping, and/or support as required for existing conduit and cable above areas with acoustic ceiling to bring up to code throughout the building. This is required by code wherever acoustical ceilings are being removed and replaced/reinstalled.

All rough-in of electrical installation, whether in new or existing walls, shall be installed in a concealed manner, unless means and methods won't allow, only then installing surface-mounted raceway is acceptable.

Furnish and install all raceway, conductor, and cable in accordance with the fire alarm system proposed.

Furnish and install all rough-in, including all sleeves, conduit, boxes, raceways, etc., for a complete installation.

No openings provided by others. All other work is complete for the building. Protect existing finishes, properly seal and repair any openings created for access and final clean spaces for occupancy.

Remove and reinstall any unforeseen acoustic ceiling tile needed to accommodate the work of this Bid Package (not shown for removal in drawings) by this Bid Package.

Furnish and install all additional access doors (not otherwise shown on drawings) needed for service access by this Bid Package

Furnish and install caulking and sealing of piping, equipment and all other items provided by this Bid Package. Caulk and/or seal penetrations through wall systems that are to remain as exposed and painted. Use material that is compatible with paint system used.

Furnish and install complete firestopping of penetrations made or required by this Bid Package through rated (smoke/fire) assemblies.

This Bid Package is to provide accessibility as defined by local electrical codes to all equipment that must be serviced and/or maintained.

PART III – UNIQUE WORK ITEMS

Provide a detailed breakdown with your bid for the design of the fire alarm system noting all inclusions and exclusions.

Reference provided preliminary design drawings prepared by Knight-Watch. These drawings have been approved by the State of Michigan for Dudley Elementary through Battle Creek Public Schools (See referenced conditional approval letter). This bid package is to provide Knight-Watch as the base bid supplier. BCPS will entertain alternate suppliers as a voluntary alternate

Demolition to include by not limited to existing wire, wire mold, devices, fire alarm panel and all associated items with existing fire alarm system

Existing fire alarm system is to be maintained and active during construction. Only when new fire alarm system is active and inspected can the old system be demoed and removed by this bid package. Install cover plates at removed devices if existing device locations will not be re-used in new construction

Wiring of new system to start over Spring Break 2025 (March 31 - April 4). Remainder of wiring to begin immediately when school is out for summer break June 9, 2025

Added - Salvage and re-use existing conduit/wire molding as much as possible to limit the amount of patch/repair and painting requried once demolition has finsihed. This mainly applies to pull stations, specifically in classrooms and gym area. All locations where conduit/wire molding will not be re-used, demo conduit/wire molding from the device back to the nearest junction box. Patch and paint to match existing adjacent surfaces.

Added - This bid package is to carry an allowance for patching and painting and will be responsible to hire and coordinate painter .

PART IV – LEED REQUIREMENTS

N/A

PART V – WORK EXCLUDED

The following work is specifically excluded from this Bid Package

PART VI – UNIT COSTS TO BE PROVIDED WITH BID

Labor rate for each category of worker on site per hour (per enclosed Labor Rates Sheet).

Provide equipment rates.

Provide the following unit costs (furnished and installed):

Smoke Device	_____	EA
Pull Station	_____	EA
Visual Device	_____	EA
Annunciator Panel	_____	EA

Provide the proposed fire alarm contractor and system if not self performed:

_____

_____

PART VII – ALTERNATES

Architectural Alternates N/A	**Add**	**Deduct**	**Amount**

Voluntary Alternates	**Add**	**Deduct**	**Amount**

PART VIII – BID BREAKDOWN

Provide the following bid breakdown (note that the sum of the bid breakdown is to equal the base bid)

Costs for electrical permit.	$
Design of Fire Alarm System	$
Demolition of Existing Fire Alarm System	
Fire Alarm System Materials	$
Fire Alarm System Installation	$
Painting and Patching Allowance	$10,000
Performance and Payment Bond (if bid is in excess of $50,000)	$

Total Bid $

End Bid Package: 26.1 Electrical

NICET CERTIFIED LEVEL III

APPROVED BY: Jeffrey Bristow
CERTIFICATION NO: 118832
SIGNED:

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

FIRE PROJECT DETAILS

CONDUIT / CABLE PATH BY	OTHERS
CABLING BY	OTHERS
FIELD DEVICE MOUNTING BY	OTHERS
FIELD TERMINATIONS BY	OTHERS
FIBER CABLING BY	N/A
PANEL TERMINATION BY	OTHERS
PERMIT PROVIDED BY	OTHERS

FIRE CODE ANALYSIS

OCCUPANCY	EDUCATION (E)
STORIES	ONE
SYSTEM TYPE	ADDRESSABLE FIRE ALARM SYSTEM
TENANT AREA	26,600 SQ FT
SPRINKLED	NO

DEVICE LEGEND

SYMBOL	QTY	EXISTING	MANUFACTURER	PART NO	DESCRIPTION
FACU	1		AUTOCALL	A2975-9443	4100ES RED 3 BAY BOX WITH GLASS DOOR AND DRESS PANEL - ADD MASTER CONTROLLER, POWER SUPPLY AND OTHER COMPONENTS AS REQUIRED USING ASSEMBLY EDITOR
	1		AUTOCALL	A100-5131	ES-PS FAN MODULE
	1		AUTOCALL	A100-2504	CS GATEWAY W/IP COM 4100ES
	1		AUTOCALL	A100-2302	8 SLOT EXP BAY FILLER PANEL
	1		AUTOCALL	A100-2153	3BAY GLASS DR PKG FACTORY ONLY
	4		AUTOCALL	A100-1279	SINGLE BLANK 2" DISPLAY COVER
	1		AUTOCALL	A100-1329	DIGITAL 70.7VRMS PRIMARY 100 W AMPLIFIER INCLUDES SIX, CLASS B AUDIO NACS
	2		AUTOCALL	A100-0644	120V ES-PS POM HARNESS
	2		AUTOCALL	A100-5451	IDNAC ADDRESSABLE NOTIFICATION SLC MODULE
	1		AUTOCALL	A100-9706	ES-PS MASTER CONTROLLER WITH ES TOUCH SCREEN DISPLAY
	1		AUTOCALL	A100-1284	8 SWITCH, 16 RED/GREEN LED MODULE
	1		AUTOCALL	A100-9705	CONTROL PANEL MOUNTED INFOALARM COMMAND CENTER
	1		AUTOCALL	A100-3117	LOOP IDNET MASTER CONTROLLER, MAX. LOAD
	1		AUTOCALL	A100-2504	CS GATEWAY W/IP COM 4100ES
	1		AUTOCALL	A100-1241	8 MINUTE MESSAGE EXPANSION MODULE
	1		AUTOCALL	A100-1255	3-8 CHANNEL AUDIO OPERATOR INTERFACE
	2		AUTOCALL	A100-0911	FACTORY USE AUDIO ONLY SHIPKIT
	2		AUTOCALL	A100-5128	BATTERY DISTRIBUTION TERMINATION MODULE
	1		AUTOCALL	A100-1294	LED/SWITCH SLIDE-IN LABEL KIT
	1		AUTOCALL	A100-1288	64 LED/64 SWITCH CONTROLLER MODULE WITH MOUNTING PLATE
	1		SPACE AGE ELECTRONICS	E120V-GT	HYBRID SURGE PROTECTION DEVICE
	1		AUTOCALL	A100-5402	EXPANSION POWER SUPPLY (ES-XPS)
	1		AUTOCALL	A100-0634	POWER DISTRIBUTION MODULE 120V
DOC	1		SPACE AGE ELECTRONICS	SSU00672	FIRE ALARM DOCUMENT BOX, RED 12" X 13" TALL 2 ¼ DEEP
FAA	1		AUTOCALL	A4606-9404	TSD REMOTE DISPLAY RED
F	22		AUTOCALL	A4099-9004	ADDRESSABLE MANUAL STATION, SINGLE ACTION, ENGLISH
	22		AUTOCALL	2975-9178	BOX/ADDRESSABLE PULL STATION
KRM R	4		AUTOCALL	A4090-9002	RELAY IAM
	4		AUTOCALL	A4090-9801	COVER, ZAM, 4", FLUSH
S	3		AUTOCALL	A4098-9755	ADDRESSABLE DUCT SENSOR HOUSINGS WITH TRUEALARM PHOTOELECTRIC SENSOR
	3		AUTOCALL	4098-9857	SAMPLING TUBE 73", PLASTIC
	3		AUTOCALL	A2098-9806	TEST STATION WITH KEYSWITCH AND RED LED STATUS INDICATOR, ON SINGLE-GANG STAINLESS STEEL PLATE; (TURNING SWITCH TO "TEST" INITIATES ALARM FOR SYSTEM TESTING)
H	2		AUTOCALL	A4098-9714	TRUEALARM PHOTOELECTRIC SMOKE DETECTOR
	2		AUTOCALL	A4098-9792	TRUEALARM SENSOR STANDARD BASE
S	68		AUTOCALL	A4098-9714	TRUEALARM PHOTOELECTRIC SMOKE DETECTOR
	68		AUTOCALL	A4098-9792	TRUEALARM SENSOR STANDARD BASE
M C	30		AUTOCALL	A49SV-APPLC	CEILING MOUNT ADDRESSABLE S/V APPLIANCE ONLY
	30		AUTOCALL	A49SVC-CWFIRE	SV COVER CEIL WHITE FIRE
M	4		AUTOCALL	A49SV-APPLW	WALL MOUNT ADDRESSABLE S/V APPLIANCE ONLY
	4		AUTOCALL	A49MP-SVWW	SV MOUNTING PLATE WALL WHITE
	4		AUTOCALL	A49SVC-WWFIRE	SV COVER WALL WHITE FIRE
C	8		AUTOCALL	A49VO-APPLC	VISUAL ONLY NOTIFICATION APPLIANCES, INDOOR CEILING MOUNT STROBE
	8		AUTOCALL	A49VOC-CWF	VO COVER, CEILING WHITE FIRE
BATT	1		AUTOCALL	A2081-9280	110 AH SEALED LEAD-ACID BATTERIES AND COMPATIBLE BATTERY CABINET (WITHOUT CHARGER), RED
	2		AUTOCALL	2081-9279	SYSTEM BATTERIES, SEALED LEAD-ACID, 110 AH

SEQUENCE OF OPERATIONS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	T	U	V
	ACTUATE COMMON ALARM SIGNAL INDICATOR	ACTUATE AUDIBLE ALARM SIGNAL	ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTUATE AUDIBLE SUPERVISORY SIGNAL	ACTUATE COMMON TROUBLE SIGNAL INDICATOR	ACTUATE AUDIBLE COMMON TROUBLE SIGNAL	ACTIVATE INDICATOR ON VIDEO DISPLAY UNIT (VDU)	PRINT OUT EVENT ON SYSTEM PRINTER	BROADCAST "FIRE ALARM" VOICE MESSAGE ON ALL FLOORS	ACTUATE VISUAL SIGNALS ON ALL FLOORS	MAIN LCD DISPLAY CHANGE OF STATUS	TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION	UNLOCK EXITS (AFTER TWO SMOKE DETECTORS IN ALARM)	ANNUNCIATOR LCD DISPLAY CHANGE OF STATUS	AHU SHUTDOWN PROCESS
MANUAL FIRE ALARM PULL STATIONS	■	■				■	■	■	■	■	■					■	
SMOKE DETECTORS	■	■				■	■	■	■	■	■				■	■	
DUCT SMOKE DETECTORS			■	■		■	■	■	■	■		■	■		■	■	■
HEAT DETECTORS	■	■				■	■	■	■	■	■				■	■	
FIRE ALARM AC POWER FAILURE			■			■	■	■				■	■			■	
FIRE ALARM SYSTEM LOW BATTERY					■	■	■	■			■			■		■	
OPEN CIRCUIT					■	■	■	■			■			■		■	
GROUND FAULT					■	■	■	■			■			■		■	
NOTIFICATION DEVICE SHORT CIRCUIT					■	■	■	■			■			■		■	
OTHER SYSTEM TROUBLES					■	■	■	■			■			■		■	

GENERAL REFERENCE LEGEND

REFERENCE INDICATORS

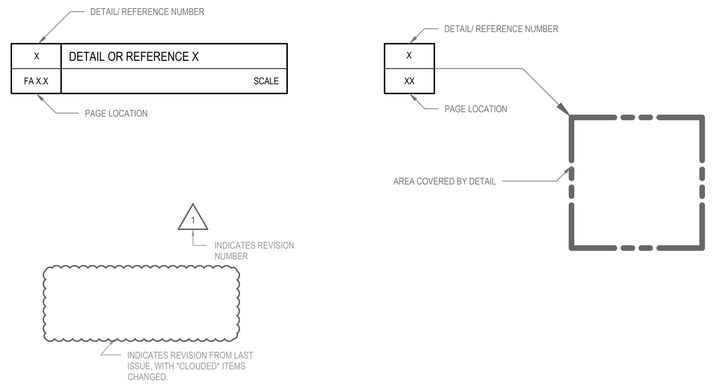
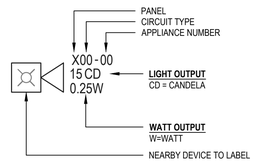


TABLE OF CONTENTS

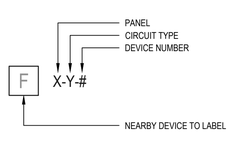
GENERAL ELECTRICAL INSTALLATION NOTES

1. ALL WIRING AND CONDUIT SHALL BE INSTALLED NEAT AND IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THE NATIONAL ELECTRIC CODE (NFPA 70), NATIONAL FIRE ALARM CODE (NFPA 72), LOCAL AUTHORITIES HAVING JURISDICTION AND PROJECT SPECIFICATIONS.
2. ALL WIRING BELOW 7' LEVEL TO BE INSTALLED IN MINIMUM 3/4" EMT. THERE SHALL BE NO BUTTSPLICES. ALL WIRE RUNS BETWEEN TERMINAL POINTS SHALL BE MADE WITH A SINGLE LENGTH OF WIRE. CONDUCTORS ARE TO BE COLOR CODED, NUMBER CODED, OR BOTH TO IDENTIFY WIRING CIRCUITS AND POLARITY. ALL WIRE SHALL COMPLY WITH ARTICLE 760 OF THE NATIONAL ELECTRIC CODE (NFPA 70). REFER TO THE PROJECT SPECIFICATIONS FOR ANY OTHER SPECIAL INSTALLATION REQUIREMENTS. LOCAL ALARM CONTROL PANELS SHALL BE MOUNTED WITH TOP OF THE PANEL AT 72" ABOVE WALKING SURFACE.
3. NO WIRING OTHER THAN THAT DIRECTLY ASSOCIATED WITH FIRE ALARM DETECTION, ALARM OR AUXILIARY FIRE PROTECTION FUNCTIONS SHALL BE IN FIRE ALARM CONDUITS.
4. ALL CONDUCTORS SHALL BE CLEARLY LABELED WITH E-Z MARKERS OR EQUIVALENT. CONDUCTORS IN CABINETS SHALL BE CAREFULLY FORMED AND HARNESSED SO THAT EACH DROPS OFF DIRECTLY OPPOSITE TO ITS TERMINAL. CABINET TERMINALS SHALL BE NUMBERED.
5. OBSERVE POLARITY WHEN CONNECTING DEVICES.
6. NOTIFICATION APPLIANCE CIRCUIT CABLE SHALL BE LOOPED DEVICE TO DEVICE AND NOT "T" TAPPED.
7. INSTALL APPROPRIATE SUPERVISORY RESISTOR WITH LAST DEVICE ON CIRCUIT AS SHOWN ON PRINTS. (THIS DOES NOT APPLY TO SLC LOOPS.)
8. ALL LOW VOLTAGE DC SUPERVISED FIELD WIRING MUST BE ISOLATED FROM AC WIRING. DO NOT RUN DC WIRING IN SAME CONDUITS AS AC WIRING.
9. FIELD WIRING MUST BE CHECKED FOR SHORTS, GROUNDS AND OPENS BEFORE CONNECTING TO CONTROL PANEL.
10. MOST CIRCUITS IN THIS SYSTEM MAINTAIN GROUND FAULT SUPERVISION. BE CAREFUL TO AVOID NICKED OR PINCHED WIRES AS MUCH AS POSSIBLE.
11. ALL CIRCUITS IN CONDUIT SIZED TO SUIT.
12. 120VAC POWER TO FIRE CONTROL PANEL FROM DEDICATED SOURCE, LOCKABLE WITH "CLEAN" EARTH GROUND BY ELECTRICAL INSTALLER.
13. AC POWER WIRING SHALL BE #12AWG SINGLE OR MULTICONDUCTOR.
14. THE SYSTEM, COMPONENT PARTS AND INSTALLATION SHALL COMPLY WITH THE APPLICABLE PORTIONS OF THE FOLLOWING CODES AND STANDARDS:
    - NFPA 70 - NATIONAL ELECTRIC CODE
    - NFPA 72 - NATIONAL FIRE ALARM CODE
    - INTERNATIONAL BUILDING CODE
    - ANSI, NEMA & U.L. STANDARDS
    - LOCAL AHJ REQUIREMENTS
15. EXACT LOCATION OF ALL EQUIPMENT IS TO BE DETERMINED IN THE FIELD. EXACT PLACEMENT MAY BE SUPERSEDED BY FIXTURES, DUCTS, TRAYS, PIPING, ETC.
16. ALL COMPONENTS, EQUIPMENT AND MATERIALS SHALL BE UL LISTED AND LABELED.
17. INFORMATION REGARDING ELECTRICAL CONNECTIONS PROVIDED BY OTHERS MUST BE SUPPLIED TO FIRE ALARM COMPANY FOR "FINAL RECORD" DRAWINGS.

NAC CIRCUIT DEVICE IDENTIFICATION



SLC DEVICE IDENTIFICATION



KNIGHT WATCH.

WWW.KNIGHTWATCH.NET

KALAMAZOO	3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048	269.381.2100
GRAND RAPIDS	545 LEGNARD ST NW, SUITE G, GRAND RAPIDS, MI 49504	616.235.2100
TROY	1260 RANKIN DRIVE, SUITE G	248.850.8164

REV	CAD DESIGNER	DATE
0	LOUIS MUSZYNSKI	7/1/2024
1		11/11/24

REVISIONS PERFORMED: ORIGINAL SUBMITTAL; CLARIFICATION 1 UPDATE

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET CERTIFIED LEVEL III — APPROVED BY: Jeffrey Bristow — CERTIFICATION NO: 118832 — SIGNED:

APPROVED BY
PRINT
SIGN
DATE

MASTER SHEET

FA

0.1

RECOMMENDED LOCATION OF DUCT SMOKE DETECTION

PER NFPA 72, 90A: LOCATE THE DUCT DETECTOR IN THE MAIN SUPPLY DUCT, DOWN STREAM FROM THE FILTERS & BLOWER, AND POSITION SO AS TO OPERATE RELIABLY IN CASE OF SMOKE IN ANY PART OF THE AIR STREAM. IF THE UNIT HAS A RATING GREATER 15,000 CFM, A SECOND DUCT DETECTOR IS REQUIRED ON THE RETURN SIDE. IT SHOULD BE LOCATED AT A POINT PRIOR TO EXHAUSTING AIR FROM THE BUILDING OR DILUTING RETURN AIR (OUTSIDE AIR). IN CASES WHERE FILTERS ARE CAPABLE OF REMOVING SMOKE, INSTALL DETECTORS BOTH UPSTREAM AND DOWNSTREAM FROM THE FILTERS. DESIGNS OF HVAC SYSTEMS MORE 2000 CFM AND GREATER IN SIZE ARE REQUIRED TO INCLUDE SMOKE DETECTORS IN THE SUPPLY (DISCHARGE) DUCT. DESIGNS OF SYSTEMS FOR MORE THAN 15,OOO CFM REQUIRED ADDITIONAL PLACEMENT OF SMOKE DETECTORS AND DAMPERS IN THE VAC DISCHARGE AND RETURN AIR PATHS.

THESE DUCT DETECTORS USE SAMPLING TUBES WHICH MONITOR THE FULL WIDTH OF THE DUCT. SINCE STRATIFICATION CAN OCCUR IN THE AIR STREAMS AFTER A LONG DUCT RUN, LOCATION THE DETECTOR PER THE DIAGRAM BELOW. THIS WILL ALLOW A MORE HOMOGENEOUS SAMPLE AND QUICKER SMOKE DETECTION.

DUCT SMOKE DETECTORS IN THE RETURN AIR STREAM SHOULD BE LOCATED AT EVERY RETURN AIR OPENING WITHIN THE SMOKE COMPARTMENT, OR WHERE THE AIR EXITS EACH SMOKE COMPARTMENT, OR IN THE DUCT SYSTEM BEFORE AIR ENTERS THE RETURN AIR SYSTEM COMMON TO MORE THAN ONE COMPARTMENT. EXCEPTIONS: ADDITIONAL DUCT DETECTORS ARE NOT REQUIRED IN DUCTS WHERE AIR PASSES THROUGH TO OTHER SMOKE COMPARTMENTS NOT SERVED BY THE DUCT.

LOCATION OF THE DUCT DETECTOR SHOULD BE BETWEEN 6 TO 10 DUCT WIDTHS DOWNSTREAM FROM OPENINGS, DEFLECTION PLATES, SHARP BENDS, OR BRANCH CONNECTIONS. WHERE THIS IS PHYSICALLY IMPOSSIBLE, THE UNIT CAN BE POSITIONED CLOSER THAN 6 DUCT WIDTHS, BUT AS FAR AS FROM THE OPENING, BEND, OR PLATES.

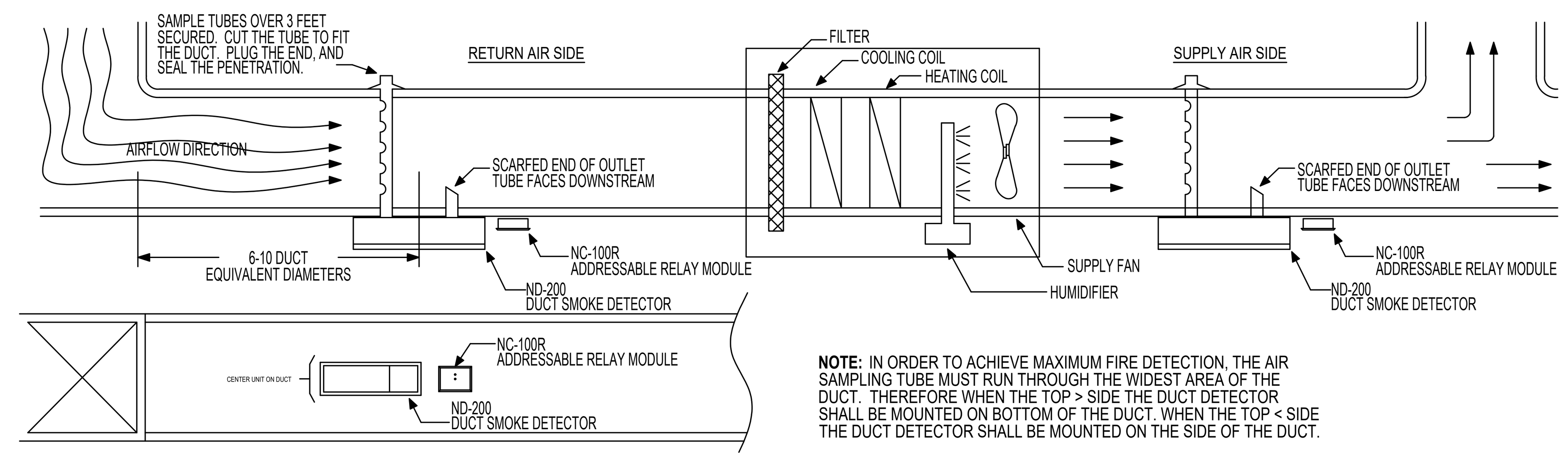
FOR FURTHER INFORMATION, CONSULT THE INSTALLATION MANUAL INCLUDED WITH EACH UNIT AND NFPA 72 FIRE ALARM CODE, AND NFPA 90A AIR CONDITIONING AND VENTILATION SYSTEMS.

DO NOT MOUNT DUCT DETECTORS OUTSIDE.

NFPA 72: WHERE IN DUCT SMOKE DETECTORS ARE INSTALLED IN CONCEALED LOCATIONS MORE THAN 10 FEET ABOVE THE FINISHED FLOOR OR IN ARRANGEMENTS WHERE THE DETECTOR'S ALARM INDICATOR IS NOT VISIBLE TO RESPONDING PERSONNEL, THE DETECTOR SHALL BE PROVIDED WITH REMOTE ALARM INDICATORS. REMOTE ALARM INDICATORS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION AND SHALL BE CLEARLY LABELED TO INDICATE BOTH THEIR FUNCTION AND THE AIR HANDLING UNIT(S) ASSOCIATED WITH EACH DETECTOR. EXCEPTION: WHERE THE SPECIFIC DETECTOR ALARM IS INDICATED AT THE CONTROL UNIT.

NFPA 72: THE LOCATION OF ALL DETECTORS IN THE AIR DUCT SYSTEM SHALL BE PERMENTLY AND CLEARLY IDENTIFIED AND RECORDED.

NFPA 72: DUCT DETECTORS SHALL BE ACCESSIBLE FOR CLEANING AND SHALL BE MOUNTED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. ACCESS DOORS OR PANELS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 90A.



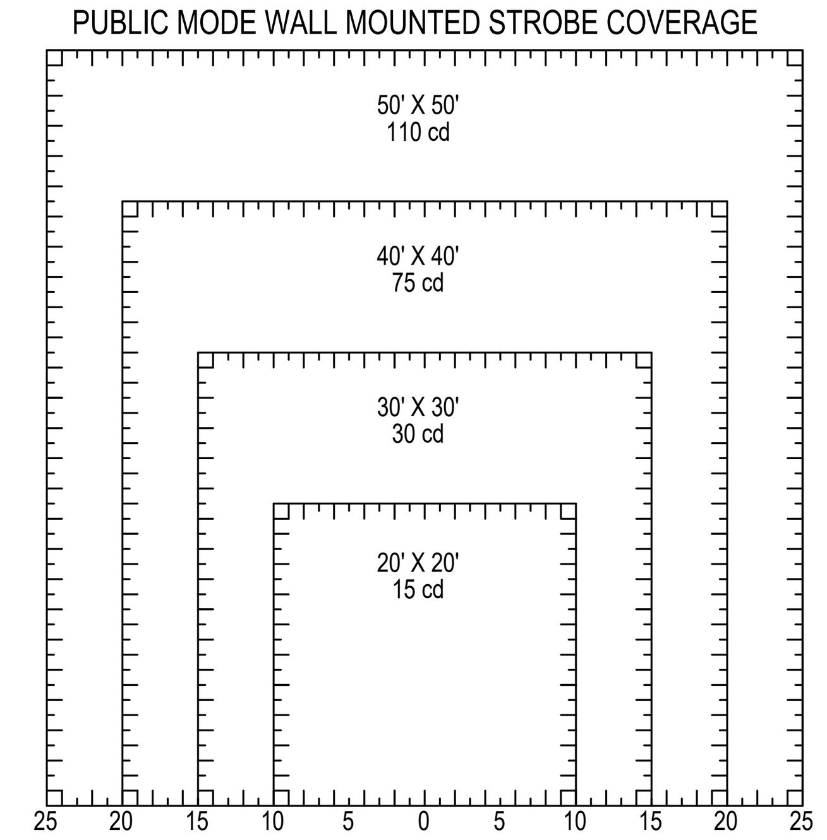
NOTE: IN ORDER TO ACHIEVE MAXIMUM FIRE DETECTION, THE AIR SAMPLING TUBE MUST RUN THROUGH THE WIDEST AREA OF THE DUCT. THEREFORE WHEN THE TOP > SIDE THE DUCT DETECTOR SHALL BE MOUNTED ON BOTTOM OF THE DUCT. WHEN THE TOP < SIDE THE DUCT DETECTOR SHALL BE MOUNTED ON THE SIDE OF THE DUCT.

TYPICAL DUCT DETECTOR MOUNTING LOCATIONS

NOT TO SCALE

NOTIFICATION APPLIANCE LOCATIONS AND SPACING

PUBLIC MODE WALL MOUNTED STROBE COVERAGE



Room Spacing for Wall Mounted Visible Appliances

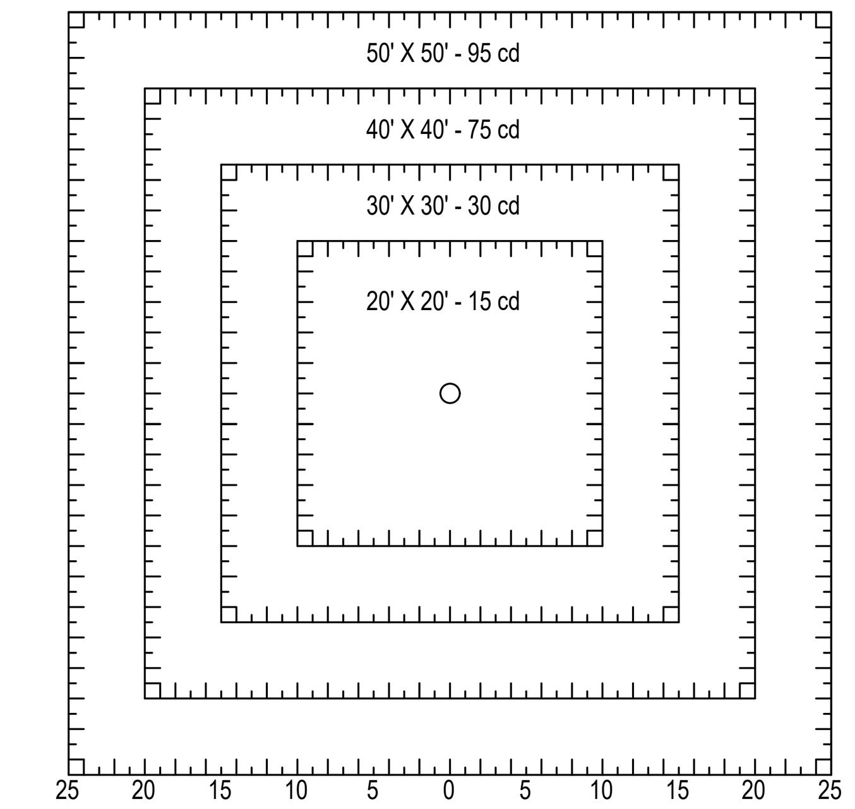
TABLE 18.5.4.3.1 (a) Maximum Room Size		Minimum Required Light Output (Effective Intensity) (cd)		
ft	m	One Light per Room	Two Lights per Room (Located on Opposite Wall)	Four Lights per Room; One Light per Wall
20 x 20	6.1 x 6.1	15	N/A	N/A
28 x 28	8.53 x 8.53	30	Unknown	N/A
30 x 30	9.14 x 9.14	34	15	N/A
40 x 40	12.2 x 12.2	60	30	15
45 x 45	13.7 x 13.7	75	Unknown	19
50 x 50	15.2 x 15.2	94	60	30
54 x 54	16.5 x 16.5	110	Unknown	30
55 x 55	16.8 x 16.8	115	Unknown	28
60 x 60	18.3 x 18.3	135	95	30
63 x 63	19.2 x 19.2	150	Unknown	37
68 x 68	20.7 x 20.7	177	Unknown	43
70 x 70	21.3 x 21.3	184	95	60
80 x 80	24.4 x 24.4	240	135	60
90 x 90	27.4 x 27.4	304	185	95
100 x 100	30.5 x 30.5	375	240	95
110 x 110	33.5 x 33.5	455	240	135
120 x 120	36.6 x 36.6	540	305	135
130 x 130	39.6 x 39.6	635	375	185

N/A: NOT ALLOWABLE

Room Spacing for Ceiling Mounted Visible Appliances

TABLE 18.5.4.3.1 (b) Maximum Room Size		Maximum Ceiling Height		Minimum Required Light Output (Effective Intensity); One Light (cd)
ft	m	ft	m	
20 x 20	6.1 x 6.1	10	3.0	15
30 x 30	9.1 x 9.1	10	3.0	30
40 x 40	12.2 x 12.2	10	3.0	60
44 x 44	13.4 x 13.4	10	3.0	75
50 x 50	15.2 x 15.2	10	3.0	95
53 x 53	16.2 x 16.2	10	3.0	110
55 x 55	16.8 x 16.8	10	3.0	115
59 x 59	18.0 x 18.0	10	3.0	135
63 x 63	19.2 x 19.2	10	3.0	150
68 x 68	20.7 x 20.7	10	3.0	177
70 x 70	21.3 x 21.3	10	3.0	185
20 x 20	6.1 x 6.1	20	6.1	30
30 x 30	9.1 x 9.1	20	6.1	45
44 x 44	13.4 x 13.4	20	6.1	75
46 x 46	14.0 x 14.0	20	6.1	80
50 x 50	15.2 x 15.2	20	6.1	95
53 x 53	16.2 x 16.2	20	6.1	110
55 x 55	16.8 x 16.8	20	6.1	115
59 x 59	18.0 x 18.0	20	6.1	135
63 x 63	19.2 x 19.2	20	6.1	150
68 x 68	20.7 x 20.7	20	6.1	177
70 x 70	21.3 x 21.3	20	6.1	185
20 x 20	6.1 x 6.1	30	9.1	55
30 x 30	9.1 x 9.1	30	9.1	75
50 x 50	15.2 x 15.2	30	9.1	95
53 x 53	16.2 x 16.2	30	9.1	110
55 x 55	16.8 x 16.8	30	9.1	115
59 x 59	18.0 x 18.0	30	9.1	135
63 x 63	19.2 x 19.2	30	9.1	150
68 x 68	20.7 x 20.7	30	9.1	177
70 x 70	21.3 x 21.3	30	9.1	185

PUBLIC MODE CEILING MOUNTED STROBE COVERAGE



SPACING ALLOCATION FOR CORRIDORS SPACING IN CORRIDORS (2010/18.5.4.4)

- FOR CORRIDORS GREATER THAN 20' WIDE, THE SPACING ALLOCATION FOR ROOMS SHALL BE APPLIED. (2010/18.5.4.4)
- VISIBLE APPLIANCES SHALL BE RATED NOT LESS THAN 15CD. (2010/18.5.4.4.3)
- THE VISIBLE APPLIANCES SHALL BE LOCATED NO MORE THAN 15' FROM THE END OF THE CORRIDOR. (2010/18.5.4.3)
- THE MAXIMUM CORRIDOR LENGTH COVERED BY A SINGLE 15 CD STROBE SHALL NOT EXCEED 30'. (2010/TABLE 18.5.4.3.1)
- THE SEPARATION BETWEEN VISIBLE APPLIANCES SHALL BE NO MORE THAN 100'. (2010/18.5.4.4.5)
- WHERE THERE IS AN INTERRUPTION OF THE CONCENTRATED VIEWING PATH, THE AREA SHALL BE CONSIDERED AS A SEPARATE CORRIDOR. (2010/18.5.4.4.6)

SPACING ALLOCATION FOR ROOMS (2010/5.4.3) SPACING IN ROOMS (2010/18.5.4.3)

- STROBE COVERAGE AREAS SHALL BE DEFINED AS

10 FT. CLG. HT.	20 FT. CLG. HT.	30 FT. CLG. HT.
15 cd = 20'x20'	30 cd = 20'x20'	55 cd = 20'x20'
30 cd = 30'x30'	45 cd = 30'x30'	75 cd = 30'x30'
60 cd = 40'x40'	80 cd = 40'x40'	115 cd = 40'x40'
95 cd = 50'x50'	115 cd = 50'x50'	150 cd = 50'x50'

(2010/TABLE 18.5.4.3.1(A) (2010/TABLE 18.5.4.3(B)

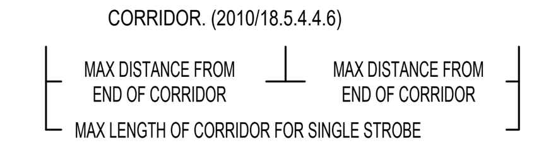
WHERE CEILING HEIGHT EXCEEDS 30', SUSPEND PER TABLE 18.5.4.5 (2010) 18.4.5.3.1 (A)

- THE MAXIMUM SEPARATION BETWEEN APPLIANCES SHALL NOT EXCEED 100'. (2010/18.5.4.4.5)
- WHERE A ROOM CONFIGURATION IS NOT SQUARE, THE SQUARE ROOM SIZE THAT ALLOWS THE ENTIRE ROOM TO BE ENCOMPASSED OR ALLOWS THE ROOM TO BE SUBDIVIDED INTO MULTIPLE SQUARE SHALL BE USED. (2010/FIGURE 18.5.4.3.1)

SLEEPING AREAS (2010/18.5.4.3.1)
- REFER TO TABLE 18.5.4.6
REFER TO TABLE 18.5.4

SPACING ALLOCATION FOR CORRIDORS SPACING IN CORRIDORS (2010/18.5.4.4)

- FOR CORRIDORS GREATER THAN 20' WIDE, THE SPACING ALLOCATION FOR ROOMS SHALL BE APPLIED. (2010/18.5.4.4)
- VISIBLE APPLIANCES SHALL BE RATED NOT LESS THAN 15CD. (2010/18.5.4.4.3)
- THE VISIBLE APPLIANCES SHALL BE LOCATED NO MORE THAN 15' FROM THE END OF THE CORRIDOR. (2010/18.5.4.3)
- THE MAXIMUM CORRIDOR LENGTH COVERED BY A SINGLE 15 CD STROBE SHALL NOT EXCEED 30'. (2010/TABLE 18.5.4.3.1)
- THE SEPARATION BETWEEN VISIBLE APPLIANCES SHALL BE NO MORE THAN 100'. (2010/18.5.4.4.5)
- WHERE THERE IS AN INTERRUPTION OF THE CONCENTRATED VIEWING PATH, THE AREA SHALL BE CONSIDERED AS A SEPARATE CORRIDOR. (2010/18.5.4.4.6)



SPACING ALLOCATION FOR ROOMS (2010/5.4.3) SPACING IN ROOMS (2010/18.5.4.3)

- STROBE COVERAGE AREAS SHALL BE DEFINED AS

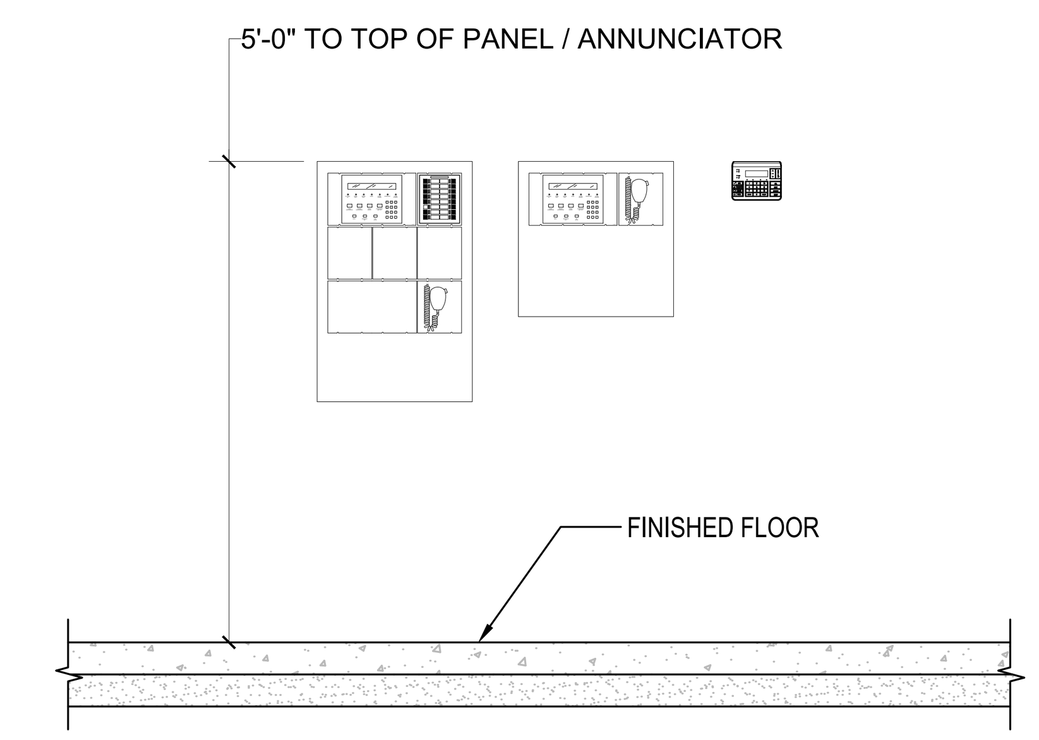
10 FT. CLG. HT.	20 FT. CLG. HT.	30 FT. CLG. HT.
15 cd = 20'x20'	30 cd = 20'x20'	55 cd = 20'x20'
30 cd = 30'x30'	45 cd = 30'x30'	75 cd = 30'x30'
60 cd = 40'x40'	80 cd = 40'x40'	115 cd = 40'x40'
95 cd = 50'x50'	115 cd = 50'x50'	150 cd = 50'x50'

(2010/TABLE 18.5.4.3.1(A) (2010/TABLE 18.5.4.3(B)

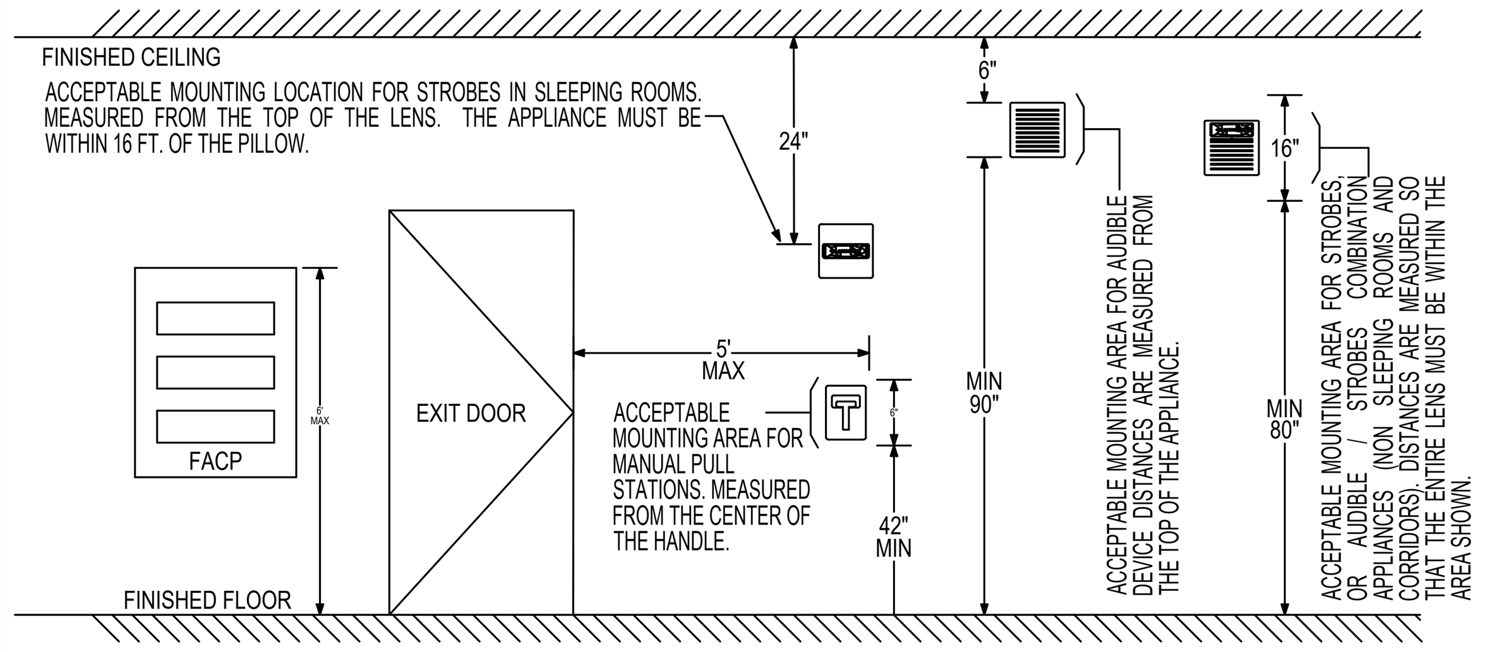
WHERE CEILING HEIGHT EXCEEDS 30', SUSPEND PER TABLE 18.5.4.5 (2010) 18.4.5.3.1 (A)

- THE MAXIMUM SEPARATION BETWEEN APPLIANCES SHALL NOT EXCEED 100'. (2010/18.5.4.4.5)
- WHERE A ROOM CONFIGURATION IS NOT SQUARE, THE SQUARE ROOM SIZE THAT ALLOWS THE ENTIRE ROOM TO BE ENCOMPASSED OR ALLOWS THE ROOM TO BE SUBDIVIDED INTO MULTIPLE SQUARE SHALL BE USED. (2010/FIGURE 18.5.4.3.1)

SLEEPING AREAS (2010/18.5.4.3.1)
- REFER TO TABLE 18.5.4.6
REFER TO TABLE 18.5.4



PANEL MOUNTING REQUIREMENTS



TYPICAL DEVICE MOUNTING HEIGHTS

NOT TO SCALE

EQUIPMENT MOUNTING NOTES:

THESE MOUNTING DIMENSIONS COMPLY WITH THE FOLLOWING CODES & STANDARDS:
- NFPA 72, CHAPTERS 2 & 4
- INTERNATIONAL BUILDING CODE SECTION 907
- CABO/ANSI A117.1 (ADA COMPLIANCE)
- ADA PARAGRAPH 4.2.5 & 4.2.6

DO NOT INSTALL ANY EQUIPMENT OUTSIDE UNLESS IT IS LISTED FOR OUTDOOR USE.

FOR LOW CEILINGS WHERE THE MOUNTING HEIGHTS CAN NOT BE MET. MOUNT THE INDICATING APPLIANCE (EX: HORNS, STROBE) 6" FROM THE CEILING.

MOUNT ALL INDICATING APPLIANCES ON THE WALL, UNLESS INDICATED OTHERWISE.

ALL DEVICE & APPLIANCE HEIGHTS SHOULD BE CONSISTENT FOR THE ENTIRE PROJECT.

THE FIRE PANEL SHALL HAVE A MINIMUM 3 FT. CLEARANCE FROM THE FRONT OF THE CONTROL EQUIPMENT & BE LOCATED IN A CLIMATE CONTROLLED AREA.

THIS INFORMATION IS PROVIDED FOR REFERENCE ONLY. THE PROJECT SPECIFICATIONS & LOCAL AHJ REQUIREMENTS SHALL BE USED AS THE ACTUAL INSTALLATION CRITERIA.

TYPICAL POWER SUPPLY CONNECTIONS FOR THE FIRE ALARM PANEL

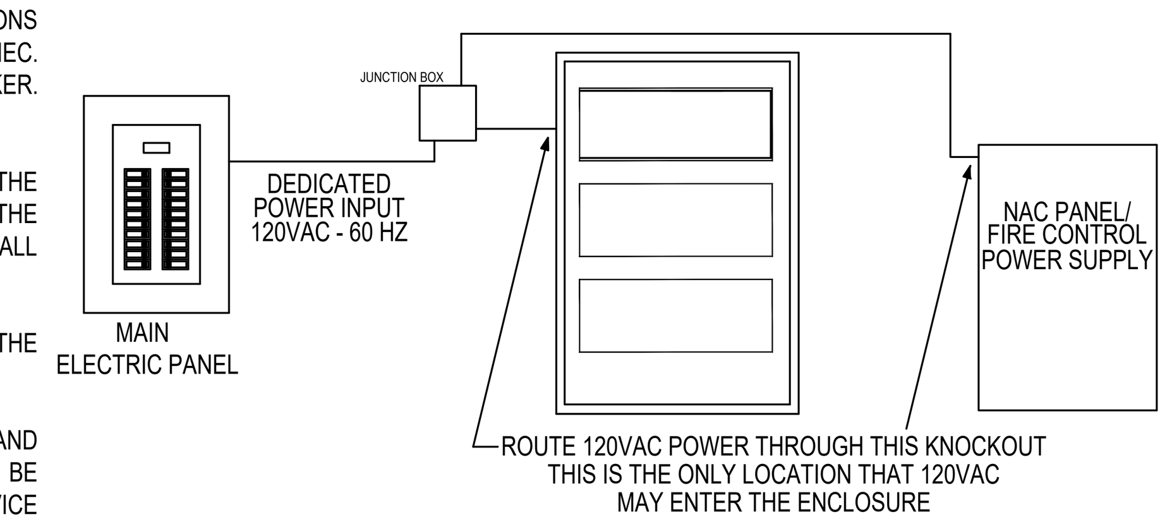
POWER SUPPLY NOTES:

THE POWER SUPPLY FOR THE FIRE ALARM EQUIPMENT IS NOT REQUIRED TO BE INSTALLED BEFORE THE MAIN BUILDING DISCONNECT. CONNECTIONS AHEAD OF THE MAIN DISCONNECTING APPARATUS CAN BE DANGEROUS BECAUSE, WHEN IMPROPERLY INSTALLED, THESE CONNECTIONS CAN ALLOW HIGH FAULT CURRENTS TO BE CARRIED ON THE PRIMARY POWER SUPPLY CONDUCTORS FOR THE FIRE ALARM SYSTEM. NEC (NFPA 70) PROVIDES GUIDELINES FOR PROPER INSTALLATION. PROPER CONNECTIONS MUST BE MADE USING SERVICE RATED EQUIPMENT IN ACCORDANCE WITH NFPA 70 230-82 (4) IN THE NEC. CIRCUIT BREAKER LOCKS ARE PERMITTED, PROVIDED THEY ARE LISTED FOR USE WITH THE BREAKER. THE LOCKS MUST ALLOW THE BREAKER TO TRIP WHEN INSTALLED.

WHERE AN EMERGENCY POWER SUPPLY (SUCH AS AN EMERGENCY GENERATOR) IS ON SITE, THE DEDICATED FIRE ALARM BREAKER IN THE ELECTRIC PANEL SHOULD ALSO BE CONNECTED TO THE EMERGENCY FEED. THE CAPACITY OF THE GENERATOR SHALL BE VERIFIED AND THE SYSTEM SHALL CONFORM TO NFPA 110, STANDARD FOR EMERGENCY AND STANDBY POWER.

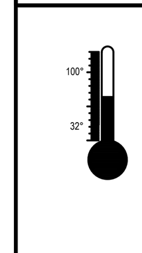
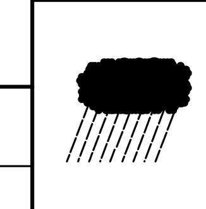
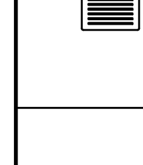
MULTIPLE FIRE ALARM PANELS ARE PERMITTED TO BE FED FROM THE SAME DEDICATED CIRCUIT. THE CIRCUIT IS DEDICATED FOR FIRE ALARM EQUIPMENT ONLY.

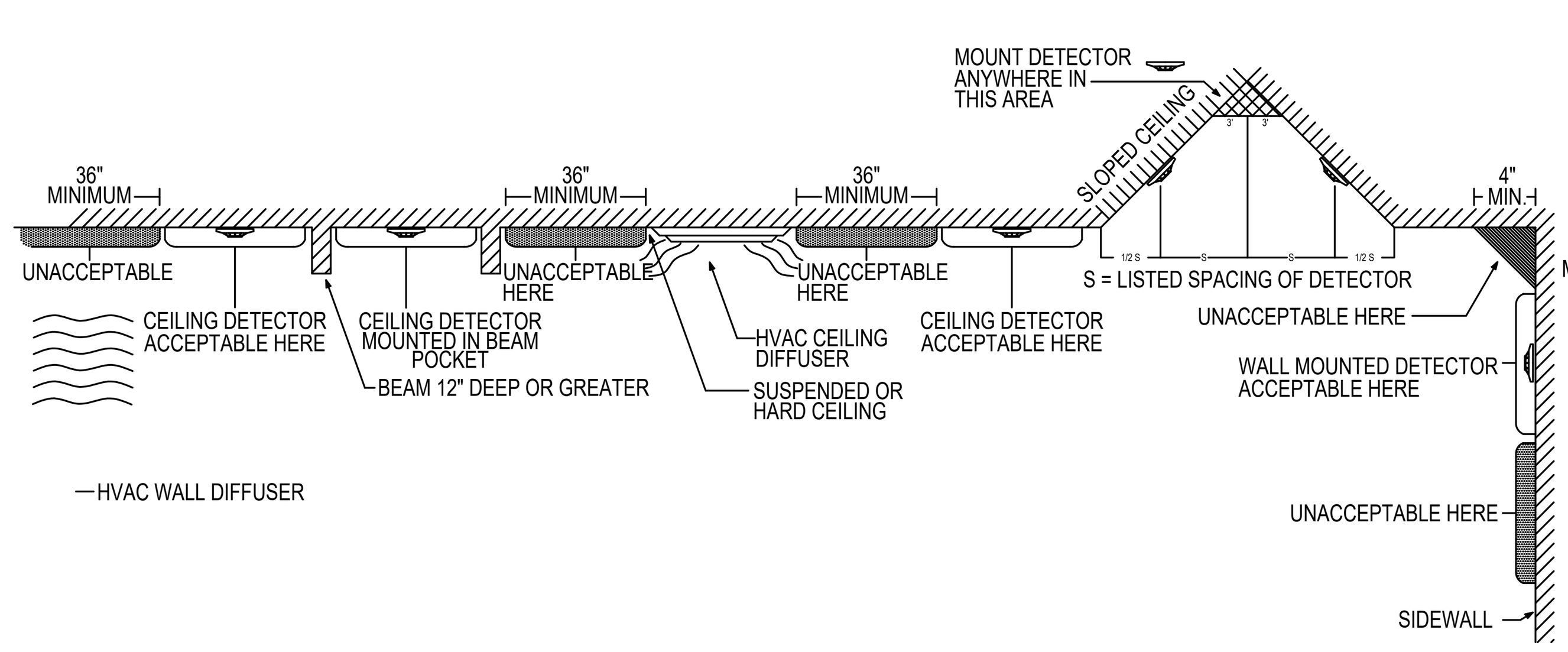
MEANS SHALL HAVE A RED MARKING, SHALL BE ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL, AND SHALL BE IDENTIFIED AS FIRE ALARM CIRCUIT CONTROL. DISCONNECTING MEANS SHALL BE PERMANENTLY IDENTIFIED AT THE FIRE ALARM CONTROL UNIT. THE OVER CURRENT PROTECTIVE DEVICE SHALL BE ENCLOSED IN A LOCKED OR SEALED CABINET IMMEDIATELY ADJACENT TO THE POINT OF CONNECTION TO THE LIGHT AND POWER CONDUCTORS. CONNECTIONS TO THE LIGHT AND POWER SERVICE SHALL BE ON A DEDICATED BRANCH CIRCUIT(S). THE CIRCUIT(S) AND CONNECTIONS SHALL BE MECHANICALLY PROTECTED. CIRCUIT DISCONNECTING THE LOCATION OF THE CIRCUIT.



TYPICAL POWER SUPPLY CONNECTIONS FOR THE FIRE ALARM PANEL

NOT TO SCALE

	THE UL LISTED OPERATING TEMPERATURE RANGE FOR ALL ADDRESSABLE DEVICES: MOST DEVICES ARE RATED FOR 32°F (0°C) TO 100°F (38°C). IF A DEVICE IS SHOWN IN AN AREA WHICH MAY EXPERIENCE EXTREME COLD OR HEAT. GENERAL RULE: IF IT IS UNCOMFORTABLE FOR YOU, THE DEVICE WILL PROBABLY NOT OPERATE CORRECTLY.
	NEVER ALLOW ANY FIRE ALARM EQUIPMENT TO GET WET. ONLY WEATHERPROOF NOTIFICATION APPLIANCES (HORN/STROBES, STROBES, ETC.) MAY BE PLACED OUTSIDE.
	DO NOT INSTALL ADDRESSABLE DEVICES UNTIL THEY HAVE BEEN ADDRESSED. DO NOT INSTALL NOTIFICATION DEVICES UNTIL THE CANDELA AND DBA SWITCHES ARE SET. SEE THE FIRE ALARM PLAN LAYOUT FOR ADDRESSES AND SETTINGS.
	DO NOT REMOVE THE YELLOW DUST COVERS FROM SMOKE DETECTORS UNTIL ALL CONSTRUCTION HAS BEEN COMPLETED. DETECTORS THAT HAVE HAD THEIR DUST COVERS REMOVED PRIOR TO THE FINAL CLEAN-UP OF ALL TRADES SHALL BE CLEANED OR REPLACED, IN ACCORDANCE WITH NFPA 72.
	ALL INITIATING DEVICES (SMOKES, MANUAL PULLS, HEATS, ETC.), MODULES (FRM-100, NMM-100, ETC.), AND NOTIFICATION APPLIANCES (HORNS, STROBES, ETC.) MUST BE INSTALLED WITH BACKBOXES. THE EQUIPMENT SHOULD NEVER BE SUPPORTED WITH THE CIRCUIT WIRES.



TYPICAL DETECTOR MOUNTING LOCATIONS, PLAN & SIDE VIEW

NOT TO SCALE

SMOKE DETECTOR NOTES:

MEASUREMENTS SHOWN ARE TO THE CLOSEST EDGE OF THE DETECTOR.

DETECTORS SHOULD NOT BE LOCATED IN DIRECT AIR FLOW OR CLOSER THAN 3 FT. (36 IN) FROM AN AIR SUPPLY DIFFUSER. NFPA 72.

AVOID LOCATING SMOKE DETECTORS IN CLOSE PROXIMITY TO DOMESTIC SMOKE SOURCES SUCH AS KITCHENS, AND AREAS OF RELATIVELY HIGH HUMIDITY WHERE CONDENSATION MAY OCCUR.

AVOID LOCATING HEAT DETECTORS IN CLOSE PROXIMITY TO DOMESTIC HEAT SOURCES SUCH AS KITCHENS, HEATERS, BURNERS, AND AREAS OF SUDDEN TEMPERATURE CHANGES.

DO NOT INSTALL SMOKE DETECTORS UNTIL ALL CONSTRUCTION IS FINAL AND COMPLETE. DETECTORS INSTALLED PRIOR TO DO FINAL CLEANUP BY ALL TRADES SHALL BE CLEANED OR REPLACED IN ACCORDANCE WITH NFPA 72 5-3.6.1.3

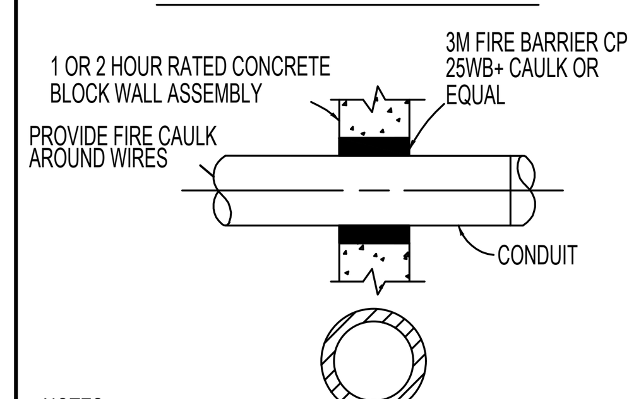
INSTALL ALL SMOKE DETECTORS ON THE CEILING UNLESS OTHERWISE NOTED.

DO NOT MOUNT DETECTORS DIRECTLY ADJACENT TO FLUORESCENT LIGHTS. A RECOMMENDED DISTANCE IS 1 FT. OR GREATER.

MOUNT SMOKE DETECTORS A MINIMUM OF 3 FT OUTSIDE BATHROOMS WHICH HAVE SHOWERS.

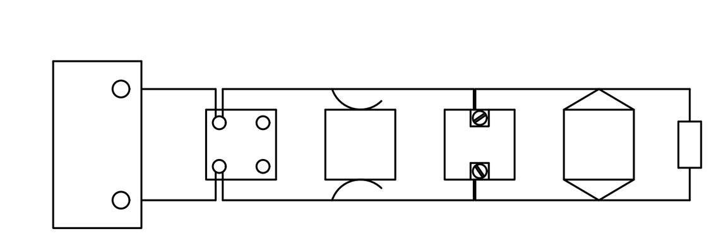
F0R BEAMS WITH DEPTHS EXCEEDING 1' OR CEILING OVER 12' IN HEIGHT, DETECTORS MUST BE INSTALLED IN EVERY BEAM POCKET.

FIRE RATED CONCRETE BLOCK WALL CONDUIT PENETRATION

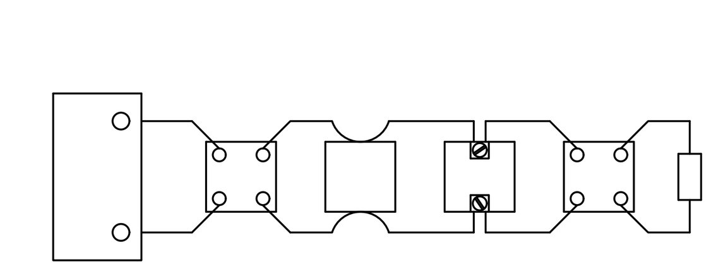


NOTES:
1. CONDUIT WILL BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY.
2. THE ANNULAR SPACE BETWEEN CONDUIT AND PERIPHERY OF OPENING WILL BE LESS THAN HALF AN INCH.
3. MAXIMUM OF (1) CONDUIT PER FIRESTOP SYSTEM.
4. 3M FIRE BARRIER CP 25WB + CAULK OR EQUAL PROVIDED ALL THAT WAY THROUGH WALL
5. CONSULT CURRENT U.L. FIRE RESISTANCE DIRECTORY FOR DETAILS.

WIRING CONNECTIONS GUIDELINES



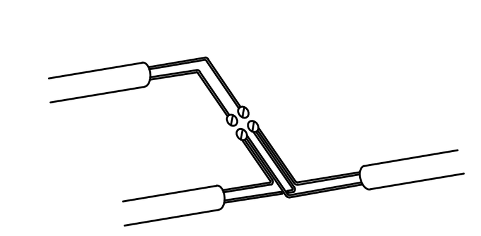
INCORRECT WIRING METHOD - 2 WIRE DETECTORS

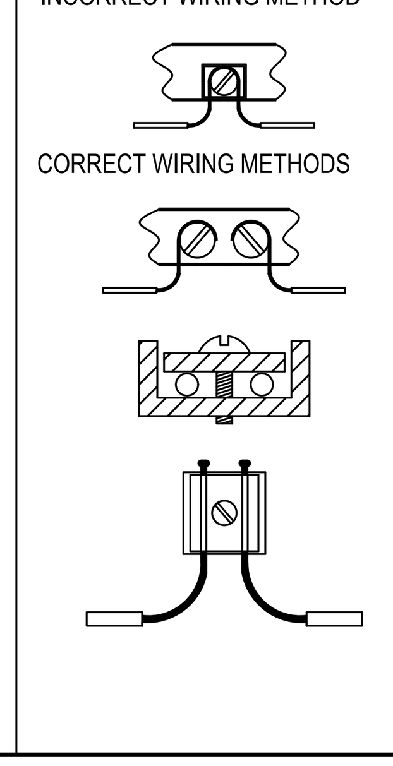


CORRECT WIRING METHOD - 2 WIRE DETECTORS

T-TAPPING GUIDELINES

1. STAR TAPS (MULTIPLE TAPS AT THE SAME LOCATION) ARE NOT PERMITTED.THE ANNULAR SPACE BETWEEN CONDUIT AND PERIPHERY OF OPENING WILL BE LESS THAN HALF AN INCH.
2. TRY TO KEEP THE T-TAPS SYMMETRICALLY LOCATED ABOUT THE TRUNK CIRCUIT.3M FIRE BARRIER CP 25WB + CAULK OR EQUAL PROVIDED ALL THAT WAY THROUGH WALL
3. MULTILEVEL T-TAPS ARE NOT PERMITTED, I.E. DO NOT T-TAP A T-TAP.
4. ONLY CLASS B CIRCUITS MAY BE T-TAPPED, NEVER CLASS A.
5. ALWAYS VERIFY THAT THE PROJECT SPECIFICATION PERMIT T-TAPPING.
6. NEVER T-TAP A NOTIFICATION CIRCUIT.
7. NEVER T-TAP A NETWORK COMMUNICATION CIRCUIT. RS-232, RS-485.
8. WIRE SHIELDS MUST BE CONNECTED TOGETHER IN THE JUNCTION BOX AND INSULATED FROM BUILDING GROUND.





WIRING SELECTION & GUIDELINES

PLENUM CABLE VS. NON-PLENUM

THE NEC RECOGNIZES 3 TYPES OF POWER LIMITED FIRE ALARM CABLING:

FPL- THIS IS A GENERAL USE POWER LIMITED FIRE ALARM CABLING. IT CANNOT BE USED IN A PLENUM SPACE OR FOR RISERS (CABLING BETWEEN FLOORS).

FPLR- THIS IS A POWER LIMITED RISER RATED CABLE THAT CAN BE USED FOR GENERAL PURPOSES OR BETWEEN FLOORS. IT CANNOT BE USED IN A PLENUM SPACE.

FPLP- THIS IS A POWER LIMITED CABLE THAT CAN BE USED IN A PLENUM, RISER, OR FOR GENERAL PURPOSES.

A PLENUM IS ANY AREA USED TO CONDUCT ENVIRONMENTAL AIR. PLENUM SPACES CAN BE DUCTWORK, THE SPACE ABOVE A DROP CEILING, OR BELOW A RAISED FLOOR. BECAUSE THESE SPACES ARE BEING USED FOR THE AIR HANDLING SYSTEM THERE ARE STRICT RULES THAT MUST BE FOLLOWED TO REDUCE THE RISK OF INTRODUCING TOXIC FUMES IN THE EVENT OF A FIRE. SINCE FIRE ALARM CABLING IS OFTEN INSTALLED EXPOSED, WITHOUT, CONDUIT, ABOVE DROP CEILINGS THE CABLING MUST BE RATED FOR USE IN A PLENUM SPACE.

CIRCUIT MARKING NEC (NFPA 70) ARTICLE 760.42

THE EQUIPMENT SHALL BE DURABLY MARKED WHERE PLAINLY VISIBLE TO INDICATE EACH CIRCUIT THAT IS POWER-LIMITED FIRE ALARM CIRCUIT.

EXCEPTION WHERE A POWER-LIMITED CIRCUIT IS TO BE RECLASSIFIED AS A NON-POWER-LIMITED CIRCUIT.

SUPPORT OF CONDUCTORS PER NEC (NFPA 70) ARTICLE 760.57

POWER-LIMITED FIRE ALARM CIRCUIT CONDUCTORS SHALL NOT BE STRAPPED, TAPED, OR ATTACHED BY ANY MEANS TO THE EXTERIOR OF ANY CONDUIT OR OTHER RACEWAY AS A MEANS OF SUPPORT.

WIRE ROUTING

NEC (NFPA 70) ARTICLE 760.55 SEPARATION FROM ELECTRIC LIGHT POWER, CLASS 1, NPLFA, AND MEDIUM POWER NETWORK-POWERED BROADBAND COMMUNICATIONS CIRCUIT CONDUCTORS.

(A) GENERAL POWER-LIMITED FIRE ALARM CIRCUIT CABLES AND CONDUCTORS SHALL NOT BE PLACED IN ANY CABLE, CABLE TRAY, COMPARTMENT, ENCLOSURE, MANHOLE, OUTLET BOX, DEVICE BOX, RACEWAY, OR SIMILAR FITTING WITH CONDUCTORS OF ELECTRIC LIGHT, POWER, CLASS 1, NON-POWER-LIMITED FIRE ALARM CIRCUITS, AND MEDIUM POWER NETWORK-POWERED BROADBAND COMMUNICATIONS CIRCUITS UNLESS PERMITTED BY 760.55

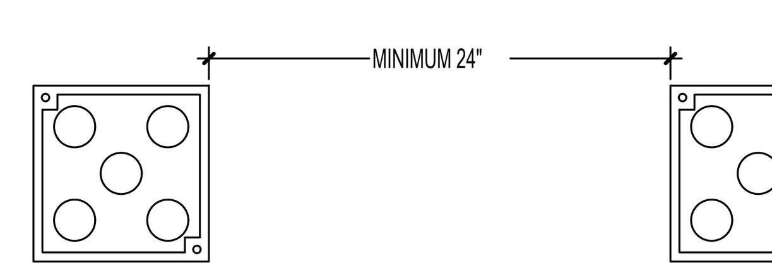
IN HOISTWAYS, POWER-LIMITED FIRE ALARM CIRCUIT CONDUCTORS SHALL BE INSTALLED IN RIGID METAL CONDUIT, RIGID NONMETALLIC CONDUIT, INTERMEDIATE METAL CONDUIT, LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT OR ELECTRICAL METALLIC TUBING. FOR ELEVATORS OR SIMILAR EQUIPMENT. THESE CONDUCTORS SHALL BE PERMITTED TO BE INSTALLED AS PROVIDED IN 620.21

NEC (NFPA 70) ARTICLE 760,61 APPLICATIONS OF LISTED PLFA CABLES. PLFA CABLES SHALL COMPLY WITH THE REQUIREMENTS DESCRIBED IN EITHER 760.61(A), (B), OR (C) OR WHERE CABLE SUBSTITUTIONS ARE MADE AS SHOWN IN 760.61(D).

CABLES INSTALLED IN DUCTS, PLENUMS, AND OTHER SPACES USED FOR ENVIRONMENTAL AIR SHALL BE TYPE FPLP. ABANDONED CABLES SHALL NOT BE PERMITTED TO REMAIN. TYPES FPLP, FPLR, AND FPL CABLES INSTALLED IN COMPLIANCE WITH 300.22 SHALL BE PERMITTED.

CABLES INSTALLED IN VERTICAL RUNS AND PENETRATING MORE THAN ONE FLOOR, OR CABLES INSTALLED IN VERTICAL RUNS IN A SHAFT, SHALL BE TYPE FPLR. FLOOR PENETRATIONS REQUIRING TYPE FPLR SHALL CONTAIN ONLY CABLES SUITABLE FOR RISER OR PLENUM USE. ABANDONED CABLES SHALL NOT BE PERMITTED TO REMAIN.

INSTALLATION GUIDELINES

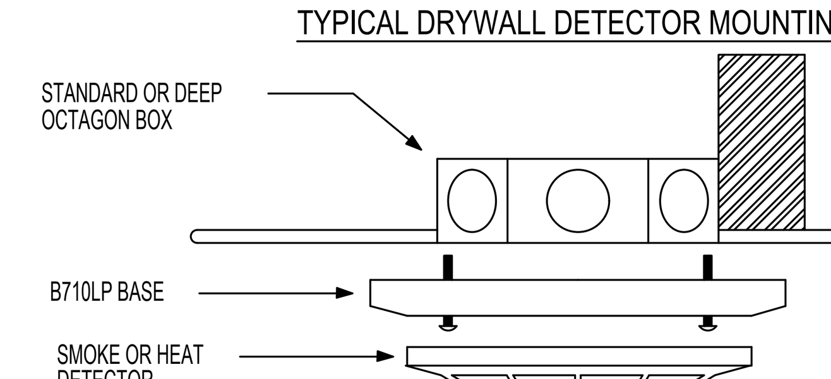


FLUSH MOUNTED ELECTRIC BOXES

NOTE: OUTLET & SWITCH BOXES ON OPPOSITE SIDES OF A WALL OR PARTITION SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 IN. IN ORDER TO MAINTAIN THE FIRE RESISTIVE RATING. IF THE MINIMUM SEPARATION DISTANCE CAN NOT BE MAINTAINED, ALTERNATIVE SOLUTIONS USING FIRE BARRIERS ARE AVAILABLE.

REFERENCE: UL FIRE RESISTANCE DIRECTORY

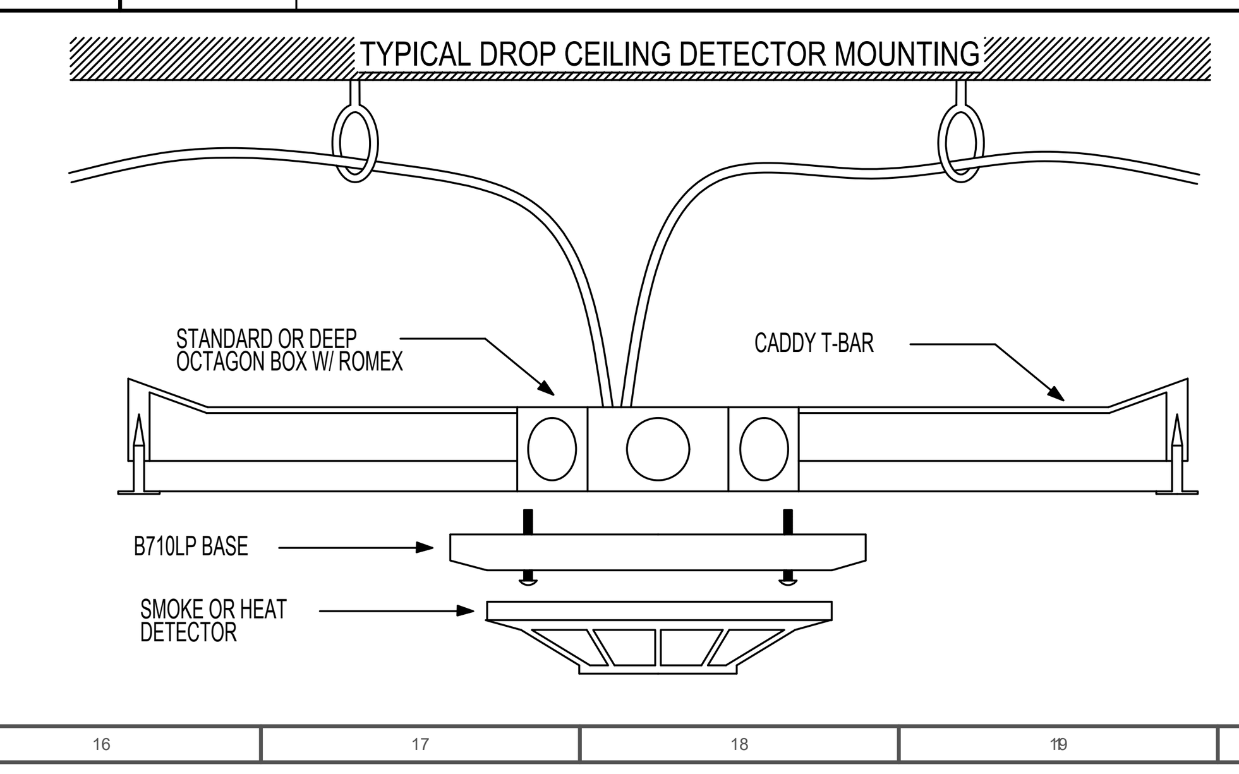
TYPICAL DRYWALL DETECTOR MOUNTING



DEVICE MOUNTING NOTE:

THE DETECTOR AND THE BASE MUST BE SUPPORTED INDEPENDENTLY OF THE CONDUCTORS PER NFPA 72 2-1.3.2, 1999 EDITION. DO NOT HOLD THE DETECTORS AGAINST THE CEILING WITH FIRE ALARM CABLE. SCREW THE BASE INTO AN ELECTRIC BOX.

TYPICAL DROP CEILING DETECTOR MOUNTING



KNIGHT WATCH.

WWW.KNIGHTWATCH.NET

KALAMAZOO	3005 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048	269.381.2100
GRAND RAPIDS	540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504	616.235.2100
TROY	1260 RANKIN DRIVE, SUITE G	248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

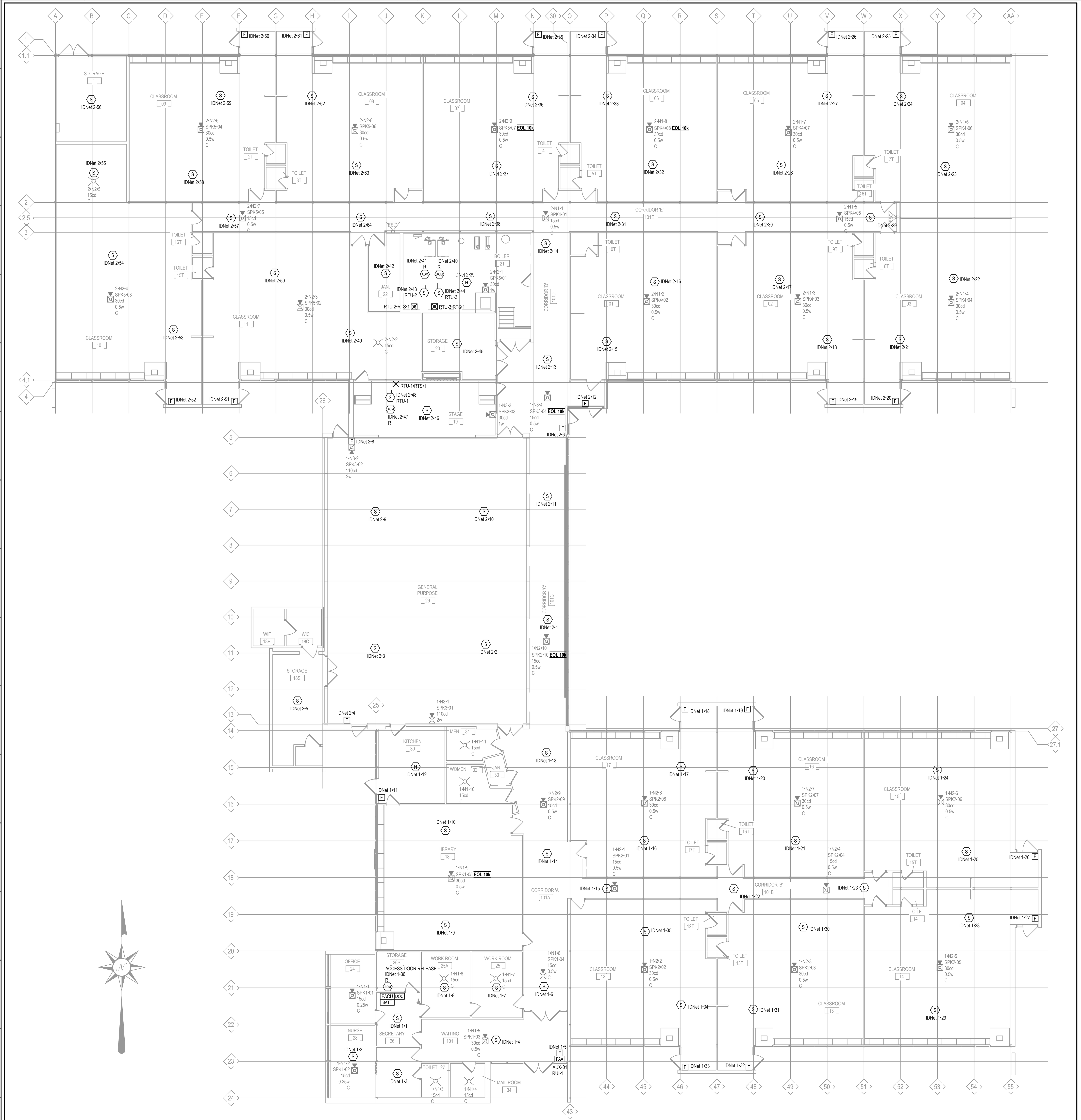
NICET CERTIFIED LEVEL III
APPROVED BY: Jeffrey Bristow
CERTIFICATION NO: 116832
SIGNED:

APPROVED BY
PRINT
SIGN
DATE

GENERAL NOTES

FA

0.2



01	OVERALL FLOOR PLAN
FA 1.1	NOT TO SCALE

KNIGHT WATCH

WWW.KNIGHTWATCH.NET

KALAMAZOO	3005 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048	269.381.2100
GRAND RAPIDS	540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504	616.235.2100
TROY	1260 RANKIN DRIVE, SUITE G	248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

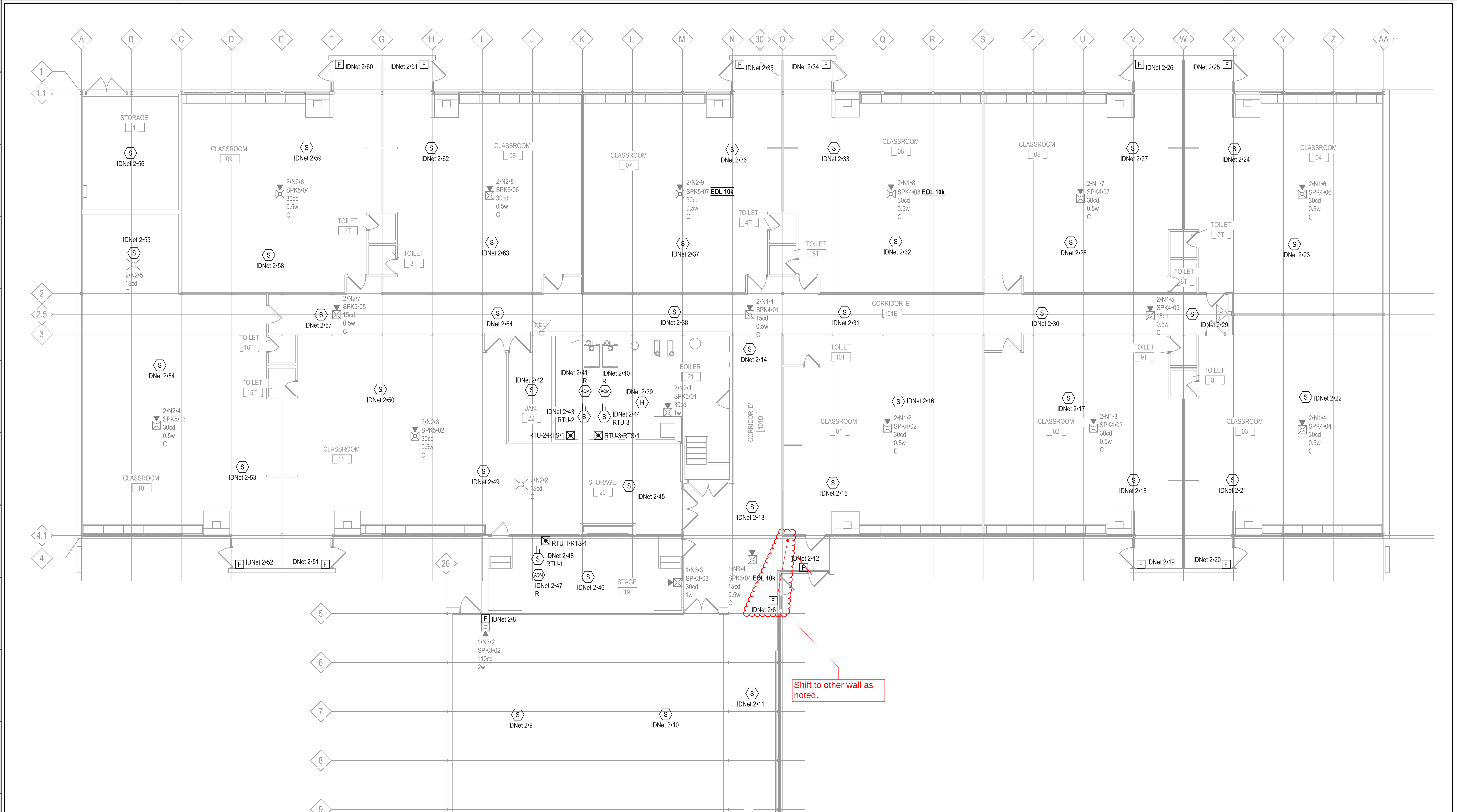
PROJECT INFORMATION	
PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET CERTIFIED LEVEL III
CERTIFICATION NO: 118832

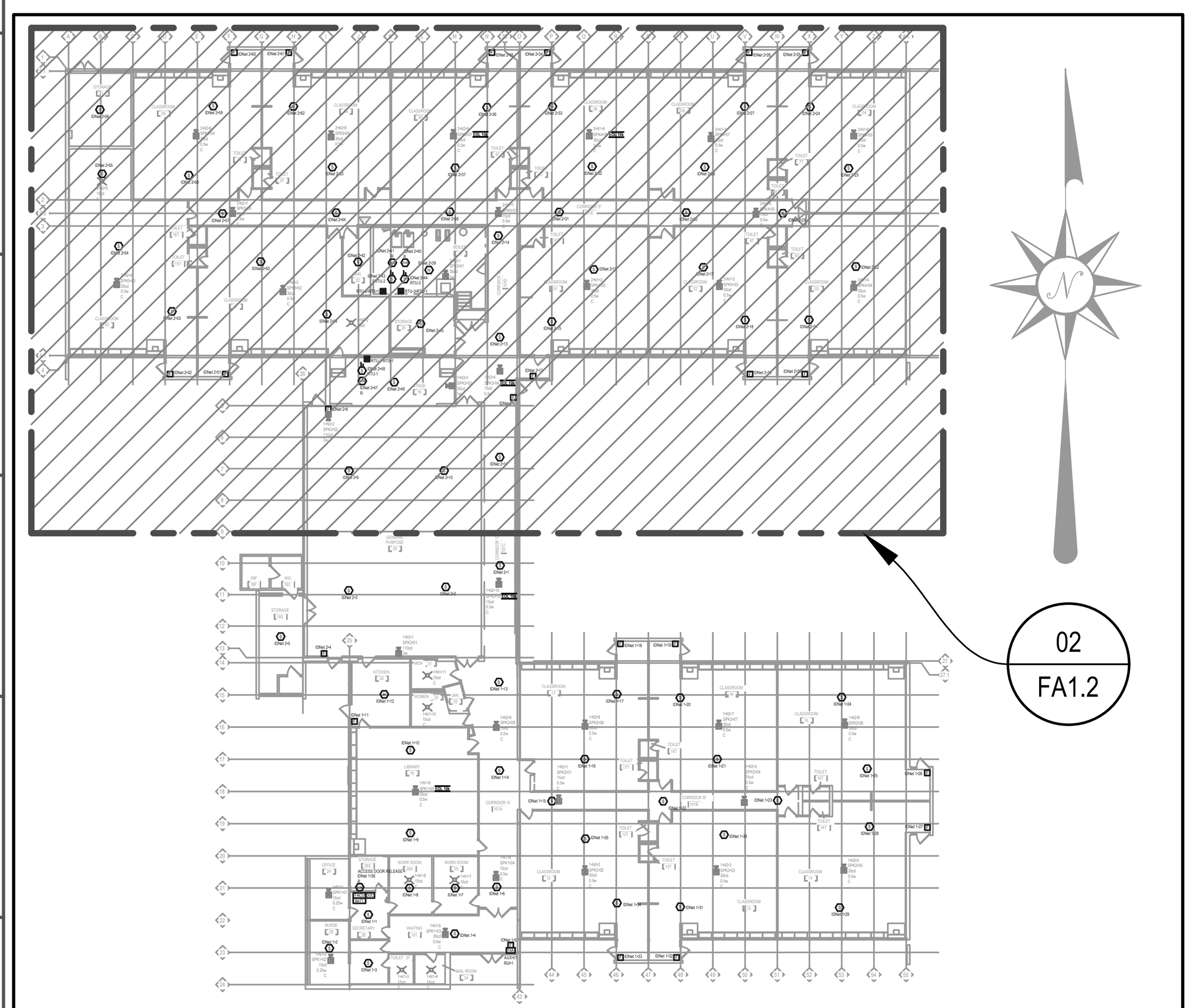
APPROVED BY
PRINT
SIGN
DATE

FLOOR PLANS

FA 1.1



02	FIRST FLOOR PLAN
FA 1.2	SCALE: 1/8" = 1'- 0"



01	OVERALL FLOOR PLAN
FA 1.2	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
KALAMAZOO 3005 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 269.381.2100
GRAND RAPIDS 540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 616.235.2100
TROY 1260 RANKIN DRIVE, SUITE G 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

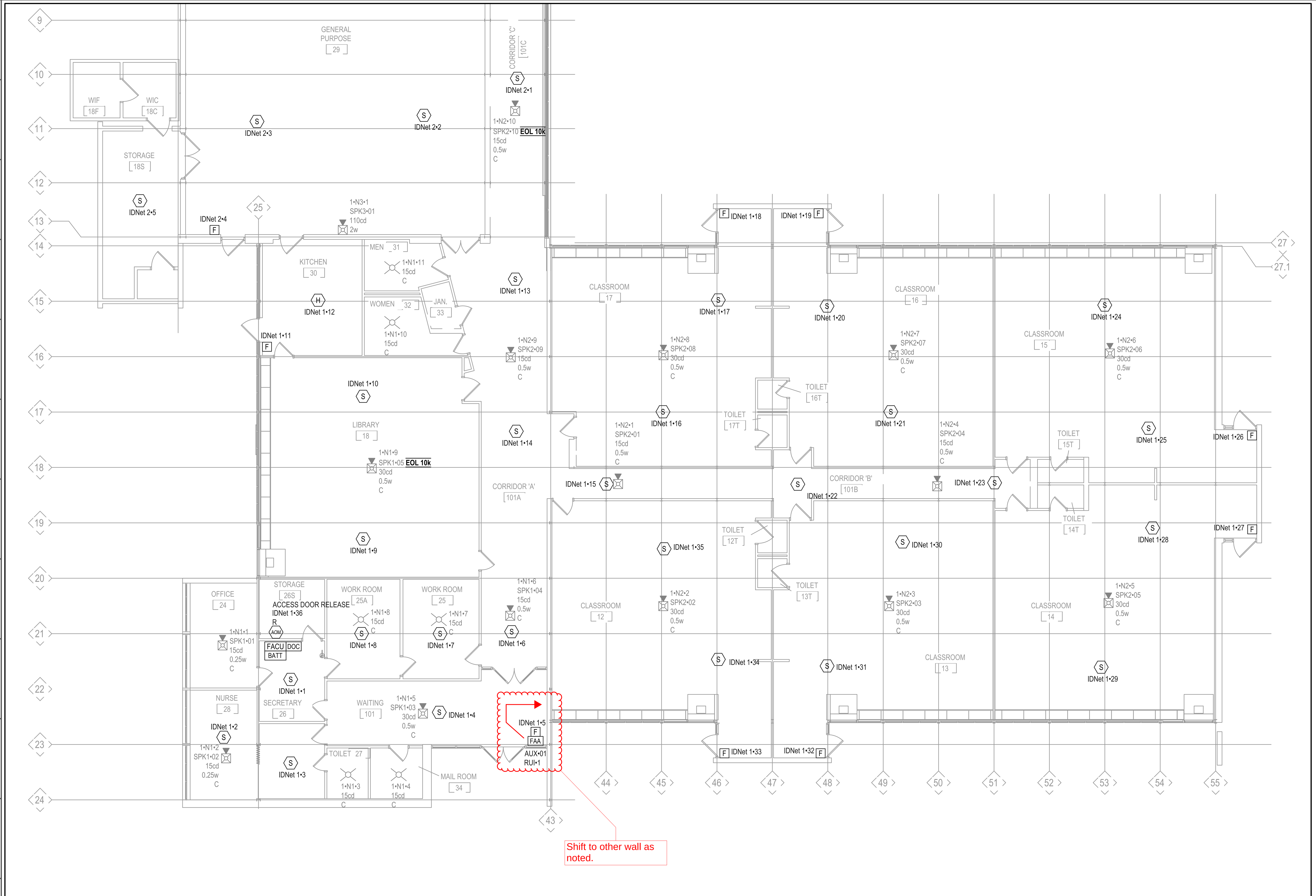
PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

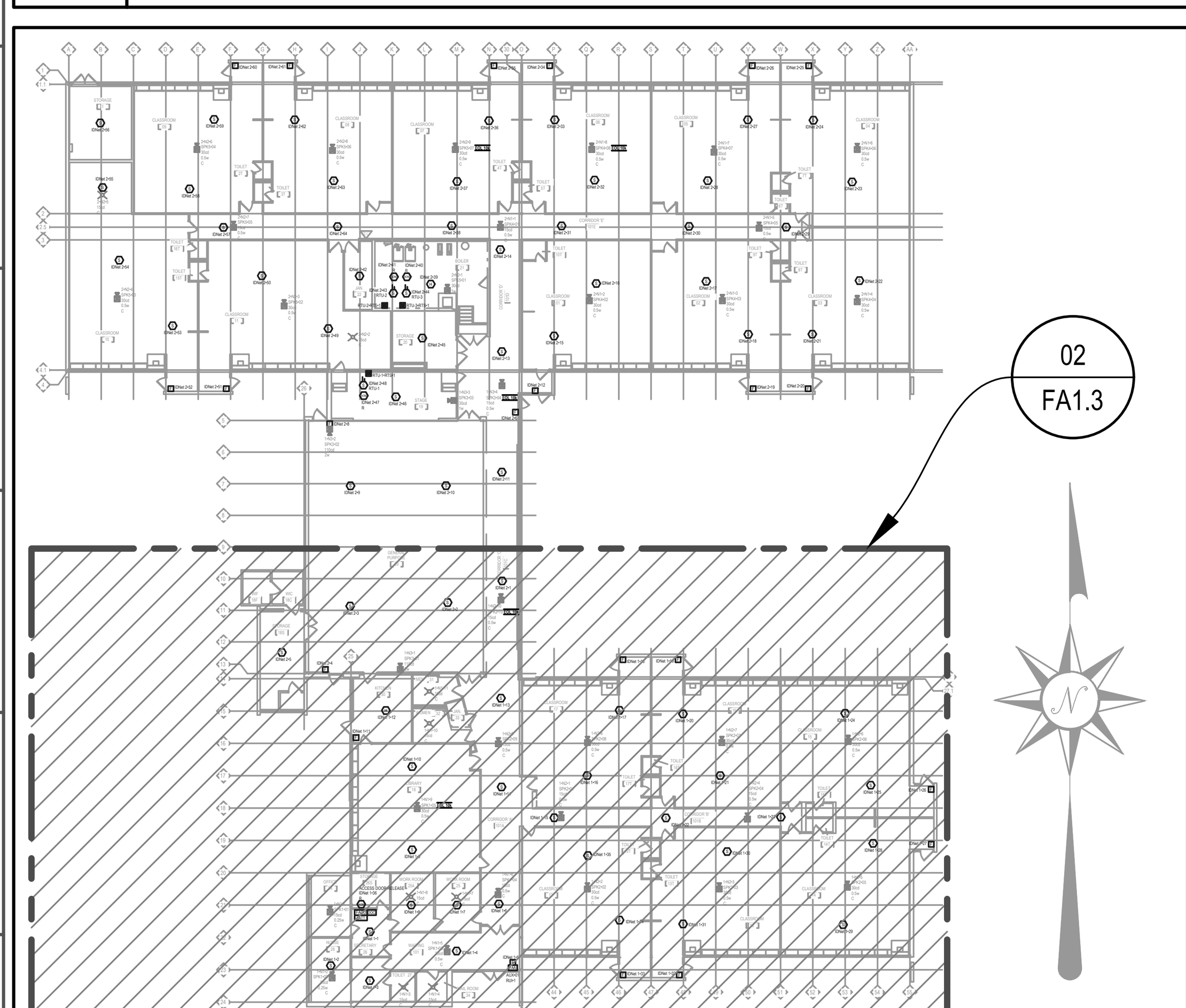
APPROVED BY
PRINT
SIGN
DATE

FLOOR PLANS

FA 1.2x



02	FIRST FLOOR PLAN
FA 1.3	SCALE: 1/8" = 1'- 0"



01	OVERALL FLOOR PLAN
FA 1.3	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET

KALAMAZOO	3005 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048	269.381.2100
GRAND RAPIDS	540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504	616.235.2100
TROY	1260 RANKIN DRIVE, SUITE G	248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

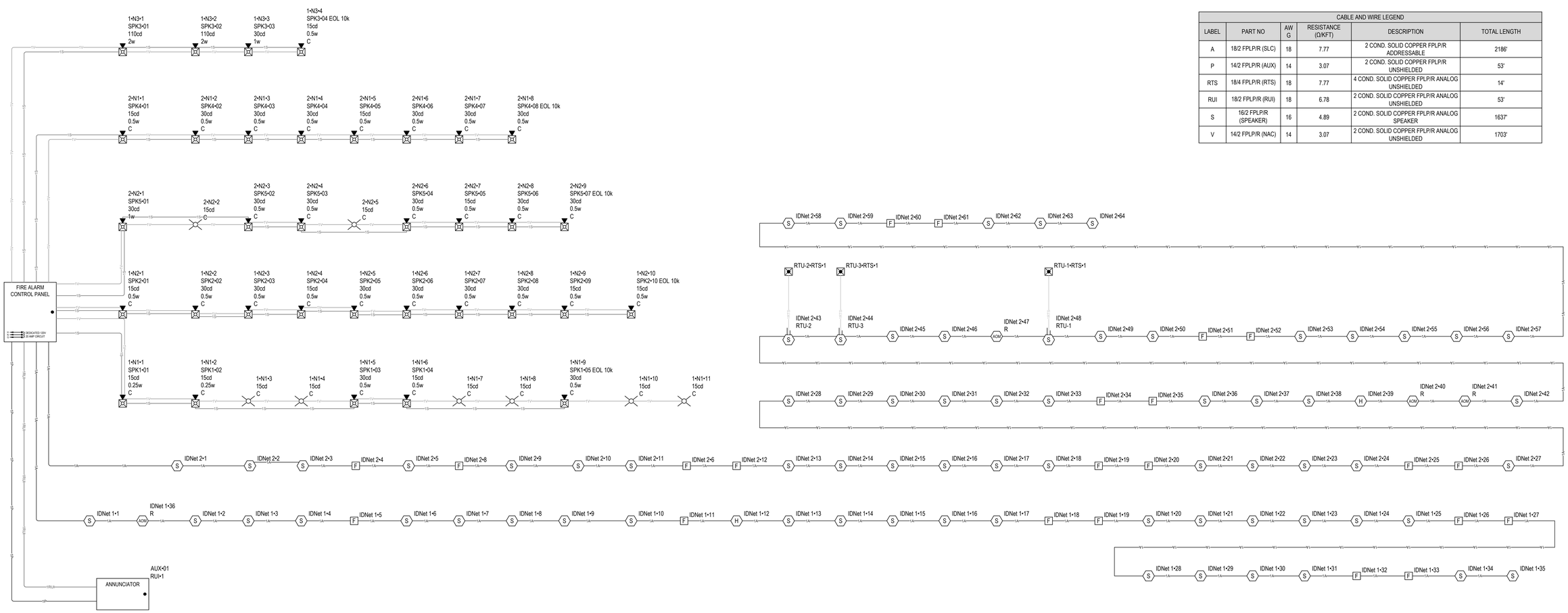
PROJECT INFORMATION	
PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET CERTIFIED LEVEL III
CERTIFICATION NO: 118832

APPROVED BY
PRINT
SIGN
DATE

FLOOR PLANS

FA 1.3x



CABLE AND WIRE LEGEND					
LABEL	PART NO	AWG	RESISTANCE (Ω/KFT)	DESCRIPTION	TOTAL LENGTH
A	18/2 FPLP/R (SLC)	18	7.77	2 COND. SOLID COPPER FPLP/R ADDRESSABLE	2186'
P	14/2 FPLP/R (AUX)	14	3.07	2 COND. SOLID COPPER FPLP/R UNSHIELDED	53'
RTS	18/4 FPLP/R (RTS)	18	7.77	4 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	14'
RUI	18/2 FPLP/R (RUI)	18	6.78	2 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	53'
S	16/2 FPLP/R (SPEAKER)	16	4.89	2 COND. SOLID COPPER FPLP/R ANALOG SPEAKER	1637'
V	14/2 FPLP/R (NAC)	14	3.07	2 COND. SOLID COPPER FPLP/R ANALOG UNSHIELDED	1703'

GEN	RISER DIAGRAM
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100
540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100
1260 RANKIN DRIVE, SUITE G | 248.850.8164
KALAMAZOO
GRAND RAPIDS
TROY

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET CERTIFIED LEVEL III
CERTIFICATION NO. 171853
APPROVED BY: Jeffrey Erskine
SIGNED:

APPROVED BY
PRINT
SIGN
DATE

RISER DIAGRAM

FA

1.4

BATTERY CALCULATION
(SECONDARY POWER SOURCE REQUIREMENTS)

		QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS) CURRENT DRAW (A)	STANDBY CURRENT (AMPS) TOTAL (A)	SECONDARY ALARM CURRENT (AMPS) CURRENT DRAW (A)	SECONDARY ALARM CURRENT (AMPS) TOTAL
PANEL COMPONENTS		2	A100-0011	FACTORY USE AUDIO ONLY SHIPKIT	0	**0**	0	**0**
		1	A100-0634	Power Distribution Module 120V	0	**0**	0	**0**
		2	A100-0644	120V ES-PS PDM Harness	0	**0**	0	**0**
		1	A100-1241	8 Minute Message Expansion Module	0.002	**0.002**	0.017	**0.017**
		1	A100-1255	3-8 Channel Audio Operator Interface	0	**0**	0.024	**0.024**
		4	A100-1279	Single blank 2" display cover	0	**0**	0	**0**
		1	A100-1284	8 Switch, 16 Red/Green LED Module	0	**0**	0.024	**0.024**
		1	A100-1288	64 LED/64 Switch Controller Module with mounting plate	0.02	**0.02**	0.02	**0.02**
		1	A100-1294	LED/SWITCH SLIDE-IN LABEL KIT	0	**0**	0	**0**
		1	A100-1329	Digital 70.7VRMS Primary 100 W Amplifier Includes six, Class B audio NACs	0.085	**0.085**	3.8	**3.8**
		1	A100-2153	3BAY GLASS DR PKG FACTORY ONLY	0	**0**	0	**0**
		1	A100-3117	Loop IDNet Master Controller, Max. Load	0.25	**0.25**	0.35	**0.35**
		2	A100-5128	battery distribution termination module	0	**0**	0	**0**
		1	A100-5131	ES-PS Fan Module	0	**0**	0.2	**0.2**
		1	A100-5401	ES Power Supply (ES-PS)	0.068	**0.068**	0.077	**0.077**
		1	A100-5402	Expansion Power Supply (ES-XPS)	0.068	**0.068**	0.077	**0.077**
		2	A100-5451	IDNAC Addressable Notification SLC Module	0.124	**0.248**	0.23	**0.46**
		1	A100-1412	ES Net Basic Digital Audio Operation with microphone, requires dedicated expansion bay	0.075	**0.075**	0.082	**0.082**
		1	A100-9705	Control Panel Mounted InfoAlerm Command Center	0.349	**0.349**	0.391	**0.391**
		1	A100-9706	ES-PS Master Controller with ES Touch Screen Display	0.362	**0.362**	0.441	**0.441**
CIRCUIT	**SYMBOL**	**QTY**	**PART NO**	**DESCRIPTION**	**CURRENT DRAW (A)**	**TOTAL (A)**	**CURRENT DRAW (A)**	**TOTAL (A)**
1•N1	C	3	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.0008	**0.0024**	0.055	**0.165**
	C	2	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.0008	**0.0016**	0.083	**0.166**
	C	6	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.0008	**0.0048**	0.055	**0.33**
1•N2	C	4	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.0008	**0.0032**	0.055	**0.22**
	C	6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.0008	**0.0048**	0.083	**0.498**
1•N3	C	1	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.0008	**0.0008**	0.055	**0.055**
		1	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 30cd	0.0008	**0.0008**	0.057	**0.057**
		2	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 110cd	0.0008	**0.0016**	0.132	**0.264**
2•N1	C	2	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.0008	**0.0016**	0.055	**0.11**
	C	6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.0008	**0.0048**	0.083	**0.498**
2•N2	C	1	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.0008	**0.0008**	0.055	**0.055**
	C	5	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.0008	**0.004**	0.083	**0.415**
		1	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 30cd	0.0008	**0.0008**	0.057	**0.057**
	C	2	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.0008	**0.0016**	0.055	**0.11**
AUX	FAA	1	A4606-9404	Remote Color Touchscreen LCD Annunciator; for flush mounting in a 5-gang RACO 944 box, or equal, supplied separately - Red	0.045	**0.045**	0.124	**0.124**
IDNet 1	R	1	A4090-9002	Relay IAM	0.0008	**0.0008**	0.001	**0.001**
	S	26	A4098-9714 w/A4098-9792	TrueAlarm Photoelectric Smoke Detector w/TrueAlarm Sensor Standard Base	0.0008	**0.0208**	0.001	**0.026**
	H	1	A4098-9733 w/A4098-9792	TrueAlarm Heat Detector w/TrueAlarm Sensor Standard Base	0.0008	**0.0008**	0.001	**0.001**
	F	8	A4099-9004	Addressable manual station, Single Action, English	0.0008	**0.0064**	0.001	**0.008**
IDNet 2	R	3	A4090-9002	Relay IAM	0.0008	**0.0024**	0.001	**0.003**
	S	42	A4098-9714 w/A4098-9792	TrueAlarm Photoelectric Smoke Detector w/TrueAlarm Sensor Standard Base	0.0008	**0.0336**	0.001	**0.042**
	H	1	A4098-9733 w/A4098-9792	TrueAlarm Heat Detector w/TrueAlarm Sensor Standard Base	0.0008	**0.0008**	0.001	**0.001**
		3	A4098-9755	Addressable Duct Sensor Housings with TrueAlarm Photoelectric Sensor	0.0008	**0.0024**	0.001	**0.003**
	F	14	A4099-9004	Addressable manual station, Single Action, English	0.0008	**0.0112**	0.001	**0.014**
RUI	FAA	1	A4606-9404	Remote Color Touchscreen LCD Annunciator; for flush mounting in a 5-gang RACO 944 box, or equal, supplied separately - Red	0	**0**	0	**0**
SPK1	C	2	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.25w	0.0008	**0.0016**	0	**0**
	C	3	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.0008	**0.0024**	0	**0**
SPK2	C	10	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.0008	**0.008**	0	**0**
SPK3	C	1	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.0008	**0.0008**	0	**0**
		1	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 1w	0.0008	**0.0008**	0	**0**
		2	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 2w	0.0008	**0.0016**	0	**0**
SPK4	C	8	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.0008	**0.0064**	0	**0**
SPK5	C	6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.0008	**0.0048**	0	**0**
		1	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 1w	0.0008	**0.0008**	0	**0**
					TOTAL STANDBY (A)	**1.712**	TOTAL ALARM (A)	**9.186**
					REQUIRED STANDBY TIME = 24 HOURS			
					REQUIRED ALARM TIME = 5 MINUTES			
SECONDARY STANDBY LOAD (A)		**1.712**			24		**41.09**	
SECONDARY ALARM LOAD (A)		**9.186**			0.08		**0.77**	
STANDBY AND ALARM SUBTOTAL (AMP HOURS)					**41.85**			
DERATING FACTOR					1.2			
SECONDARY LOAD REQUIREMENTS (AMP HOURS)					**50.22**			

GEN | BATTERY CALCULATIONS
TYP | NOT TO SCALE

AUX POINT-TO-POINT REPORT

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	29	Max. Voltage Drop:	**0.04**
Min. Operational Voltage:	16	End Of Line Voltage:	**28.96**
Max. Circuit Current (A):	2	Voltage Drop Percent:	**0.14 %**
Wire Resistance (Ω/kFt):	3.07	Total Circuit Current (A):	**0.124**
Total Circuit Length (Ft):	53	Spare Current (A):	**1.876**
Total Circuit Resistance (Ω):	0.327886	Spare Current (A) Percent:	**93.80 %**

Circuit Wiring Properties: 'P' 14/2 FPLP/R (AUX) 14 AWG, 2 Cond. Solid Copper FPLP/R Unshielded
Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
AUX•01	A4606-9202	Remote Color Touchscreen LCD Annunciator; for flush mounting in a 5-gang RACO 944 box, or equal, supplied separately - Red	0.124	**0.124**	53	**0.327886**	**0.04**	**28.96**	**0.04**	**0.14 %**

Calculation Methods:
Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)
Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

1 N1 POINT-TO-POINT REPORT

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	29	Max. Voltage Drop:	**0.38**
Min. Operational Voltage:	23	End Of Line Voltage:	**28.62**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**1.30 %**
Wire Resistance (Ω/kFt):	3.07	Total Circuit Current (A):	**0.661**
Total Circuit Length (Ft):	176	Spare Current (A):	**2.339**
Total Circuit Resistance (Ω):	1.082141	Spare Current (A) Percent:	**77.97 %**

Circuit Wiring Properties: 'V' 14/2 FPLP/R (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded
Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
1•N1•1	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.661**	9	**0.053983**	**0.04**	**28.96**	**0.04**	**0.12 %**
1•N1•2	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.606**	18	**0.10763**	**0.07**	**28.9**	**0.1**	**0.35 %**
1•N1•3	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.551**	21	**0.127893**	**0.07**	**28.83**	**0.17**	**0.59 %**
1•N1•4	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.496**	8	**0.046762**	**0.02**	**28.81**	**0.19**	**0.67 %**
1•N1•5	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.441**	13	**0.078836**	**0.03**	**28.77**	**0.23**	**0.79 %**
1•N1•6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.358**	28	**0.171152**	**0.06**	**28.71**	**0.29**	**1.00 %**
1•N1•7	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.303**	11	**0.069488**	**0.02**	**28.69**	**0.31**	**1.07 %**
1•N1•8	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.248**	12	**0.072118**	**0.02**	**28.67**	**0.33**	**1.14 %**
1•N1•9	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.193**	24	**0.149836**	**0.03**	**28.64**	**0.36**	**1.24 %**
1•N1•10	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.11**	25	**0.153749**	**0.02**	**28.62**	**0.38**	**1.29 %**
1•N1•11	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.055**	8	**0.050694**	**0**	**28.62**	**0.38**	**1.30 %**

Calculation Methods:
Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)
Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

1 N2 POINT-TO-POINT REPORT

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	29	Max. Voltage Drop:	**0.97**
Min. Operational Voltage:	23	End Of Line Voltage:	**28.03**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**3.33 %**
Wire Resistance (Ω/kFt):	3.07	Total Circuit Current (A):	**0.718**
Total Circuit Length (Ft):	371	Spare Current (A):	**2.282**
Total Circuit Resistance (Ω):	2.277229	Spare Current (A) Percent:	**76.07 %**

Circuit Wiring Properties: 'V' 14/2 FPLP/R (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded
Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
1•N2•1	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.718**	77	**0.471058**	**0.34**	**28.66**	**0.34**	**1.17 %**
1•N2•2	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.663**	25	**0.154646**	**0.1**	**28.56**	**0.44**	**1.52 %**
1•N2•3	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.58**	34	**0.208798**	**0.12**	**28.44**	**0.56**	**1.94 %**
1•N2•4	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.497**	25	**0.155244**	**0.08**	**28.36**	**0.64**	**2.20 %**
1•N2•5	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.442**	43	**0.266256**	**0.12**	**28.24**	**0.76**	**2.61 %**
1•N2•6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.359**	38	**0.231986**	**0.08**	**28.16**	**0.84**	**2.90 %**
1•N2•7	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.276**	33	**0.201672**	**0.06**	**28.1**	**0.9**	**3.09 %**
1•N2•8	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.193**	35	**0.212692**	**0.04**	**28.06**	**0.94**	**3.23 %**
1•N2•9	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.11**	23	**0.143092**	**0.02**	**28.05**	**0.95**	**3.28 %**
1•N2•10	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.055**	38	**0.231785**	**0.01**	**28.03**	**0.97**	**3.33 %**

Calculation Methods:
Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)
Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

GEN | VOLTAGE DROP CALCULATIONS | IDNAC-1 & AUX POWER
TYP | NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
KALAMAZOO | 3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100
GRAND RAPIDS | 545 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100
TROY | 1260 RANKIN DRIVE, SUITE G | 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET CERTIFIED LEVEL III — CERTIFICATION NO. 170533
APPROVED BY: Jeffrey Erickson
SIGNED:

APPROVED BY
PRINT
SIGN
DATE

CALCULATIONS

FA

1.5

1 N3 POINT-TO-POINT REPORT

Circuit Wiring Properties: 'V' 14/2 FPLP/R (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded

Distance measured using drawn segment lengths with 10.00 % additional length calculated

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	29	Max. Voltage Drop:	**0.32**
Min. Operational Voltage:	23	End Of Line Voltage:	**28.68**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**1.11 %**
Wire Resistance (Ω/kFt):	3.07	Total Circuit Current (A):	**0.376**
Total Circuit Length (Ft):	209	Spare Current (A):	**2.624**
Total Circuit Resistance (Ω):	1.285389	Spare Current (A) Percent:	**87.47 %**

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
1•N3•1	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 110cd	0.132	**0.376**	73	**0.447238**	**0.17**	**28.83**	**0.17**	**0.58 %**
1•N3•2	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 110cd	0.132	**0.244**	82	**0.50073**	**0.12**	**28.71**	**0.29**	**1.00 %**
1•N3•3	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 30cd	0.057	**0.112**	39	**0.241957**	**0.03**	**28.68**	**0.32**	**1.09 %**
1•N3•4	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.055**	16	**0.095464**	**0.01**	**28.68**	**0.32**	**1.11 %**

Calculation Methods:

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

2 N1 POINT-TO-POINT REPORT

Circuit Wiring Properties: 'V' 14/2 FPLP/R (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded

Distance measured using drawn segment lengths with 10.00 % additional length calculated

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	29	Max. Voltage Drop:	**1.33**
Min. Operational Voltage:	23	End Of Line Voltage:	**27.67**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**4.58 %**
Wire Resistance (Ω/kFt):	3.07	Total Circuit Current (A):	**0.608**
Total Circuit Length (Ft):	484	Spare Current (A):	**2.392**
Total Circuit Resistance (Ω):	2.973545	Spare Current (A) Percent:	**79.73 %**

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
2•N1•1	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.608**	213	**1.310001**	**0.8**	**28.2**	**0.8**	**2.75 %**
2•N1•2	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.553**	42	**0.256778**	**0.14**	**28.06**	**0.94**	**3.24 %**
2•N1•3	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.47**	34	**0.210662**	**0.1**	**27.96**	**1.04**	**3.58 %**
2•N1•4	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.387**	35	**0.215205**	**0.08**	**27.88**	**1.12**	**3.86 %**
2•N1•5	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.304**	44	**0.271998**	**0.08**	**27.8**	**1.2**	**4.15 %**
2•N1•6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.249**	46	**0.279984**	**0.07**	**27.73**	**1.27**	**4.39 %**
2•N1•7	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.166**	38	**0.231023**	**0.04**	**27.69**	**1.31**	**4.52 %**
2•N1•8	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.083**	32	**0.197894**	**0.02**	**27.67**	**1.33**	**4.58 %**

Calculation Methods:

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

2 N2 POINT-TO-POINT REPORT

Circuit Wiring Properties: 'V' 14/2 FPLP/R (NAC) 14 AWG, 2 Cond. Solid Copper FPLP/R Analog Unshielded

Distance measured using drawn segment lengths with 10.00 % additional length calculated

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	29	Max. Voltage Drop:	**1.28**
Min. Operational Voltage:	23	End Of Line Voltage:	**27.72**
Max. Circuit Current (A):	3	Voltage Drop Percent:	**4.43 %**
Wire Resistance (Ω/kFt):	3.07	Total Circuit Current (A):	**0.637**
Total Circuit Length (Ft):	463	Spare Current (A):	**2.363**
Total Circuit Resistance (Ω):	2.840546	Spare Current (A) Percent:	**78.77 %**

Device Label	Part No.	Description	Device Current (A)	Remaining Current (A)	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent
2•N2•1	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 30cd	0.057	**0.637**	183	**1.121822**	**0.71**	**28.29**	**0.71**	**2.46 %**
2•N2•2	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.58**	36	**0.219271**	**0.13**	**28.16**	**0.84**	**2.90 %**
2•N2•3	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.525**	26	**0.158063**	**0.08**	**28.08**	**0.92**	**3.19 %**
2•N2•4	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.442**	45	**0.275586**	**0.12**	**27.95**	**1.05**	**3.61 %**
2•N2•5	A49VO-APPLC	Visual Only Notification Appliances, Indoor Ceiling Mount Strobe 15cd	0.055	**0.359**	31	**0.187829**	**0.07**	**27.89**	**1.11**	**3.84 %**
2•N2•6	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.304**	36	**0.221902**	**0.07**	**27.82**	**1.18**	**4.07 %**
2•N2•7	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 15cd	0.055	**0.221**	30	**0.181491**	**0.04**	**27.78**	**1.22**	**4.21 %**
2•N2•8	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.166**	45	**0.278429**	**0.05**	**27.73**	**1.27**	**4.37 %**
2•N2•9	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 30cd	0.083	**0.083**	32	**0.196153**	**0.02**	**27.72**	**1.28**	**4.43 %**

Calculation Methods:

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

GEN	VOLTAGE DROP CALCULATIONS | IDNAC-2
TYP	NOT TO SCALE

KNIGHT WATCH.

WWW.KNIGHTWATCH.NET

KALAMAZOO | 3005 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100

GRAND RAPIDS | 540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100

TROY | 1260 RANKIN DRIVE, SUITE G | 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET® CERTIFIED LEVEL III

APPROVED BY: Jeffrey Bristow

CERTIFICATION NO: 118832

SIGNED:

APPROVED BY

PRINT

SIGN

DATE

CALCULATIONS

FA

1.6

SPK1 SPEAKER SCHEDULE

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	70.7	Max. dB Loss:	-0.002535
Min. Operational Voltage:	63	End Of Line Voltage:	70.68
Max. Circuit Watts:	100	Voltage Drop Percent:	0.03 %
Wire Resistance (Ω/kFt):	4.89	Total Circuit Watts:	2
Total Circuit Length (Ft):	132	Spare Watts:	98 W
Total Circuit Resistance (Ω):	1.290105 Ω	Spare Watts Percent:	98.00 %

Circuit Wiring Properties: 'S' 16/2 FPLP/R (SPEAKER) 16 AWG, 2 Cond. Solid Copper FPLP/R Analog Speaker

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Watts	Watts To Amps Conversion	Remaining Watts	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent	dB Loss From Previous	Total dB Loss
SPK1•01	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.25w	0.25	0.003536	2	8	0.080644	0	70.7	0	0.00 %	-0.00028	-0.00028
SPK1•02	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.25w	0.25	0.003536	1.75	16	0.160225	0	70.69	0.01	0.01 %	-0.000487	-0.000768
SPK1•03	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	1.5	36	0.35573	0.01	70.69	0.01	0.02 %	-0.000927	-0.001695
SPK1•04	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	1	28	0.272617	0	70.68	0.02	0.02 %	-0.000474	-0.002169
SPK1•05 EOL 10k	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	0.5	43	0.420889	0	70.68	0.02	0.03 %	-0.000366	-0.002535

Calculation Methods:

Watts To Amps Conversion = Device Watts / Voltage

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

dB Loss From Previous = 20 × Log (Voltage At Previous Device / Voltage At Device)

Max. dB Loss = 20 × Log (Voltage At Last Device / Start Voltage)

SPK2 SPEAKER SCHEDULE

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	70.7	Max. dB Loss:	-0.018813
Min. Operational Voltage:	63	End Of Line Voltage:	70.55
Max. Circuit Watts:	100	Voltage Drop Percent:	0.22 %
Wire Resistance (Ω/kFt):	4.89	Total Circuit Watts:	5
Total Circuit Length (Ft):	371	Spare Watts:	95 W
Total Circuit Resistance (Ω):	3.627249 Ω	Spare Watts Percent:	95.00 %

Circuit Wiring Properties: 'S' 16/2 FPLP/R (SPEAKER) 16 AWG, 2 Cond. Solid Copper FPLP/R Analog Speaker

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Watts	Watts To Amps Conversion	Remaining Watts	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent	dB Loss From Previous	Total dB Loss
SPK2•01	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	5	77	0.750318	0.05	70.65	0.05	0.08 %	-0.006522	-0.006522
SPK2•02	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	4.5	25	0.246325	0.02	70.63	0.07	0.10 %	-0.001928	-0.008449
SPK2•03	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	4	34	0.33258	0.02	70.61	0.09	0.12 %	-0.002314	-0.010764
SPK2•04	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	3.5	25	0.247278	0.01	70.6	0.1	0.14 %	-0.001506	-0.012269
SPK2•05	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	3	43	0.424101	0.02	70.58	0.12	0.17 %	-0.002214	-0.014484
SPK2•06	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	2.5	38	0.369515	0.01	70.57	0.13	0.19 %	-0.001608	-0.016092
SPK2•07	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	2	33	0.321231	0.01	70.56	0.14	0.20 %	-0.001119	-0.01721
SPK2•08	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	1.5	35	0.338784	0.01	70.55	0.15	0.21 %	-0.000885	-0.018095
SPK2•09	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	1	23	0.227922	0	70.55	0.15	0.21 %	-0.000397	-0.018492
SPK2•10 EOL 10k	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	0.5	38	0.369195	0	70.55	0.15	0.22 %	-0.000321	-0.018813

Calculation Methods:

Watts To Amps Conversion = Device Watts / Voltage

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

dB Loss From Previous = 20 × Log (Voltage At Previous Device / Voltage At Device)

Max. dB Loss = 20 × Log (Voltage At Last Device / Start Voltage)

SPK3 SPEAKER SCHEDULE

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	70.7	Max. dB Loss:	-0.012805
Min. Operational Voltage:	63	End Of Line Voltage:	70.6
Max. Circuit Watts:	100	Voltage Drop Percent:	0.15 %
Wire Resistance (Ω/kFt):	4.89	Total Circuit Watts:	5.5
Total Circuit Length (Ft):	209	Spare Watts:	94.5 W
Total Circuit Resistance (Ω):	2.047413 Ω	Spare Watts Percent:	94.50 %

Circuit Wiring Properties: 'S' 16/2 FPLP/R (SPEAKER) 16 AWG, 2 Cond. Solid Copper FPLP/R Analog Speaker

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Watts	Watts To Amps Conversion	Remaining Watts	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent	dB Loss From Previous	Total dB Loss
SPK3•01	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 2w	2	0.028289	5.5	73	0.712376	0.06	70.64	0.06	0.08 %	-0.006811	-0.006811
SPK3•02	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 2w	2	0.028289	3.5	82	0.79758	0.04	70.61	0.09	0.13 %	-0.004856	-0.011667
SPK3•03	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 1w	1	0.014144	1.5	39	0.385398	0.01	70.6	0.1	0.15 %	-0.001006	-0.012673
SPK3•04 EOL 10k	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	0.007072	0.5	16	0.152059	0	70.6	0.1	0.15 %	-0.000132	-0.012805

Calculation Methods:

Watts To Amps Conversion = Device Watts / Voltage

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

dB Loss From Previous = 20 × Log (Voltage At Previous Device / Voltage At Device)

Max. dB Loss = 20 × Log (Voltage At Last Device / Start Voltage)

GEN	SPEAKER SCHEDULE | SPK 1-3
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
KALAMAZOO: 3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100
GRAND RAPIDS: 545 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100
TROY: 1260 RANKIN DRIVE, SUITE G | 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1	"	CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET CERTIFIED LEVEL III — CERTIFICATION No. 179535 — APPROVED BY: Jeffrey Erskine — SIGN:

APPROVED BY
PRINT
SIGN
DATE

SPEAKER SCHEDULE

FA

1.7

SPK4 SPEAKER SCHEDULE

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	70.7	Max. dB Loss:	**-0.023844**
Min. Operational Voltage:	63	End Of Line Voltage:	**70.51**
Max. Circuit Watts:	100	Voltage Drop Percent:	**0.27 %**
Wire Resistance (Ω/kFt):	4.89	Total Circuit Watts:	**4**
Total Circuit Length (Ft):	484	Spare Watts:	**96 W**
Total Circuit Resistance (Ω):	4.736361 Ω	Spare Watts Percent:	**96.00 %**

Circuit Wiring Properties: 'S' 16/2 FPLP/R (SPEAKER) 16 AWG, 2 Cond. Solid Copper FPLP/R Analog Speaker

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Watts	Watts To Amps Conversion	Remaining Watts	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent	dB Loss From Previous	Total dB Loss
SPK4-01	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**4**	213	**2.086614**	**0.12**	**70.58**	**0.12**	**0.17 %**	**-0.014516**	**-0.014516**
SPK4-02	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**3.5**	42	**0.409005**	**0.02**	**70.56**	**0.14**	**0.20 %**	**-0.002492**	**-0.017008**
SPK4-03	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**3**	34	**0.335549**	**0.01**	**70.55**	**0.15**	**0.22 %**	**-0.001753**	**-0.018761**
SPK4-04	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**2.5**	35	**0.342785**	**0.01**	**70.54**	**0.16**	**0.23 %**	**-0.001492**	**-0.020253**
SPK4-05	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**2**	44	**0.433247**	**0.01**	**70.52**	**0.18**	**0.25 %**	**-0.001509**	**-0.021762**
SPK4-06	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**1.5**	46	**0.445968**	**0.01**	**70.51**	**0.19**	**0.26 %**	**-0.001165**	**-0.022928**
SPK4-07	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**1**	38	**0.367981**	**0.01**	**70.51**	**0.19**	**0.27 %**	**-0.000641**	**-0.023569**
SPK4-08 EOL 10k	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**0.5**	32	**0.315212**	**0**	**70.51**	**0.19**	**0.27 %**	**-0.000275**	**-0.023844**

Calculation Methods:

Watts To Amps Conversion = Device Watts / Voltage

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

dB Loss From Previous = 20 × Log (Voltage At Previous Device / Voltage At Device)

Max. dB Loss = 20 × Log (Voltage At Last Device / Start Voltage)

SPK5 SPEAKER SCHEDULE

CIRCUIT SETTINGS		TOTALS	
Starting Calculation Voltage:	70.7	Max. dB Loss:	**-0.020468**
Min. Operational Voltage:	63	End Of Line Voltage:	**70.53**
Max. Circuit Watts:	100	Voltage Drop Percent:	**0.24 %**
Wire Resistance (Ω/kFt):	4.89	Total Circuit Watts:	**4**
Total Circuit Length (Ft):	439	Spare Watts:	**96 W**
Total Circuit Resistance (Ω):	4.292258 Ω	Spare Watts Percent:	**96.00 %**

Circuit Wiring Properties: 'S' 16/2 FPLP/R (SPEAKER) 16 AWG, 2 Cond. Solid Copper FPLP/R Analog Speaker

Distance measured using drawn segment lengths with 10.00 % additional length calculated

Device Label	Part No.	Description	Device Watts	Watts To Amps Conversion	Remaining Watts	Dist. From Previous (Ft)	Resistance From Previous (Ω)	Voltage Drop From Previous	Voltage At Device	Total Voltage Drop	Voltage Drop Percent	dB Loss From Previous	Total dB Loss
SPK5-01	A49SV-APPLW	Wall Mount Addressable S/V Appliance only 1w	1	**0.014144**	**4**	183	**1.786876**	**0.1**	**70.6**	**0.1**	**0.14 %**	**-0.012429**	**-0.012429**
SPK5-02	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**3**	45	**0.443685**	**0.02**	**70.58**	**0.12**	**0.17 %**	**-0.002317**	**-0.014746**
SPK5-03	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**2.5**	45	**0.438963**	**0.02**	**70.56**	**0.14**	**0.19 %**	**-0.00191**	**-0.016656**
SPK5-04	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**2**	59	**0.577719**	**0.02**	**70.55**	**0.15**	**0.21 %**	**-0.002012**	**-0.018668**
SPK5-05	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**1.5**	30	**0.289084**	**0.01**	**70.54**	**0.16**	**0.22 %**	**-0.000755**	**-0.019423**
SPK5-06	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**1**	45	**0.443492**	**0.01**	**70.54**	**0.16**	**0.23 %**	**-0.000772**	**-0.020195**
SPK5-07 EOL 10k	A49SV-APPLC	Ceiling Mount Addressable S/V Appliance only 0.5w	0.5	**0.007072**	**0.5**	32	**0.312439**	**0**	**70.53**	**0.17**	**0.24 %**	**-0.000272**	**-0.020468**

Calculation Methods:

Watts To Amps Conversion = Device Watts / Voltage

Resistance From Previous (Ω) = Wire Resistance (Ω/Ft) x 2 x Dist. From Previous (Ft)

Voltage Drop From Previous = Resistance From Previous (Ω) x Remaining Current (A)

dB Loss From Previous = 20 × Log (Voltage At Previous Device / Voltage At Device)

Max. dB Loss = 20 × Log (Voltage At Last Device / Start Voltage)

GEN	SPEAKER SCHEDULE | SPK 4-5
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100 | KALAMAZOO
540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100 | GRAND RAPIDS
1260 RANKIN DRIVE, SUITE G | 248.850.8164 | TROY

REVISIONS PERFORMED	DATE
ORIGINAL SUBMITTAL	7/1/2024
CLARIFICATION 1 UPDATE	11/11/24

REV	CAD DESIGNER
0	LOUIS MUSZYNSKI
1	

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
QBD NUMBER	-

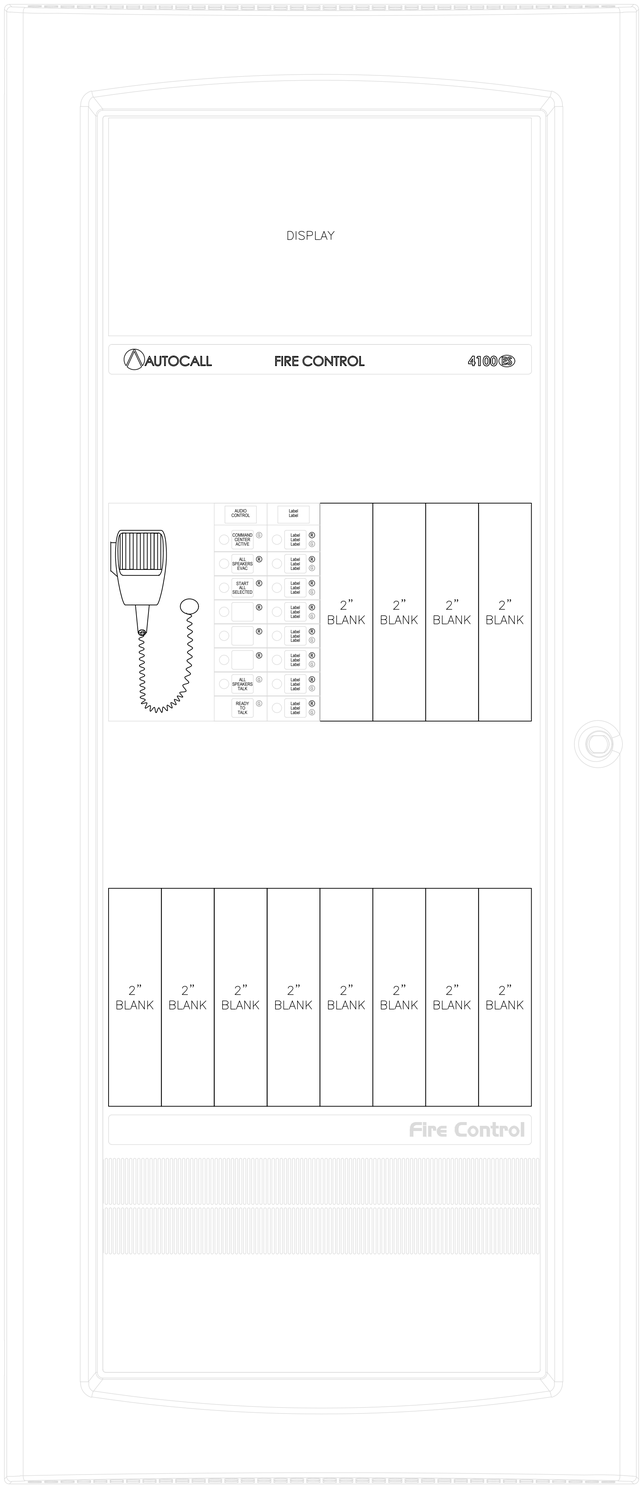
NICET CERTIFIED LEVEL III — CERTIFICATE NO. 118632 — APPROVED BY: Jeffrey Erskine — SIGNED:

APPROVED BY
PRINT
SIGN
DATE

SPEAKER SCHEDULE

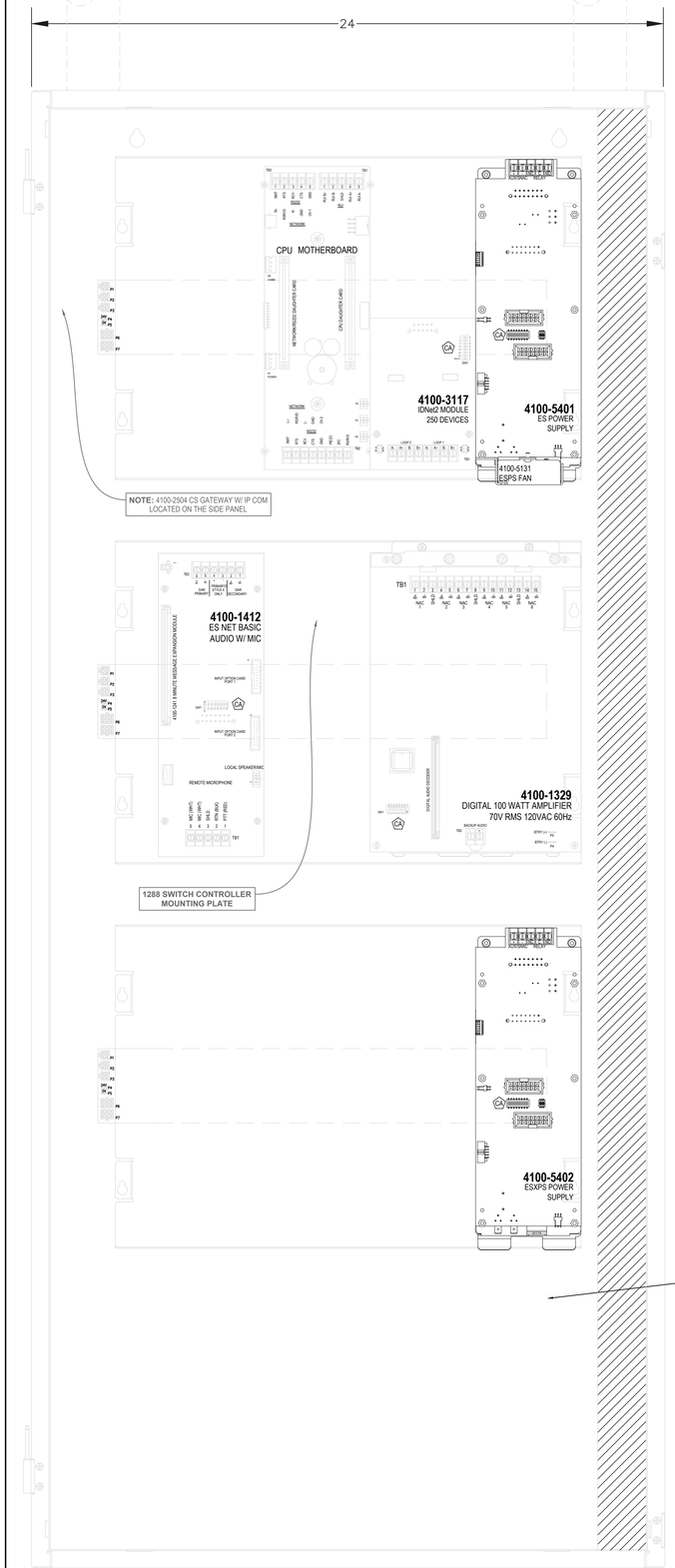
FA

1.8



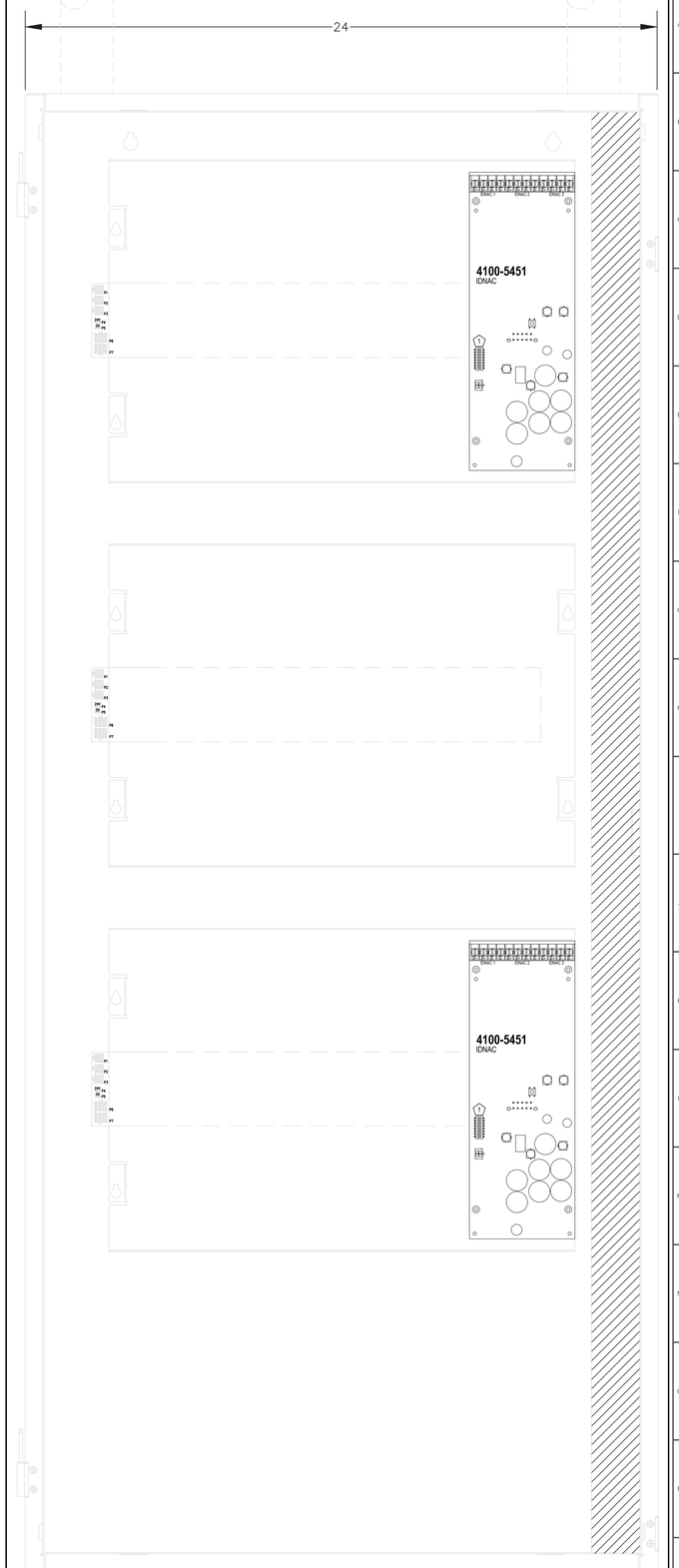
GEN | FIRE ALARM CONTROL PANEL | FRONT

TYP | NOT TO SCALE



GEN | FIRE ALARM CONTROL PANEL | BACK

TYP | NOT TO SCALE



GEN | FIRE ALARM CONTROL PANEL | ABOVE BACK DEVICES

TYP | NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
KALAMAZOO | 3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100
GRAND RAPIDS | 540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100
TROY | 1260 RANKIN DRIVE, SUITE G | 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

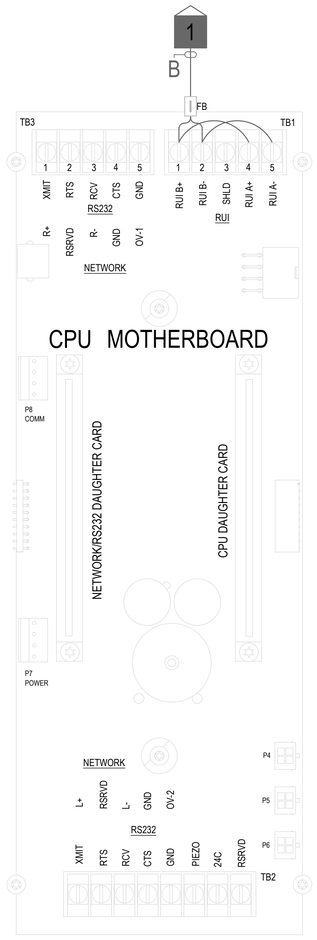
NICET CERTIFIED LEVEL II
CERTIFICATION NO. 719535
APPROVED BY: Jeffrey Erickson
DATE: 11/12

APPROVED BY
PRINT
SIGN
DATE

FIRE PANEL DIAGRAMS

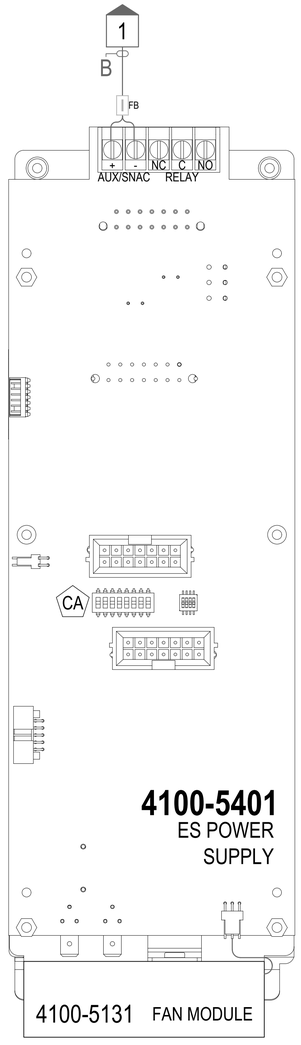
FA

2.1



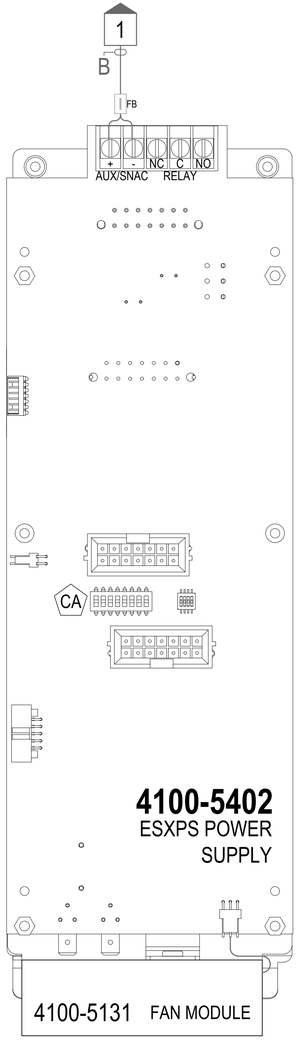
1	RUI	TO REMOTE ANNUNCIATOR	B

GEN	CPU WIRING DIAGRAM
TYP	NOT TO SCALE



1	AUX	TO AUX DEVICES	B

GEN	ES POWER SUPPLY WITH FAN MODULE WIRING DIAGRAM
TYP	NOT TO SCALE



1	AUX	TO AUX DEVICES	B

GEN	ESXPS POWER SUPPLY WITH FAN MODULE WIRING DIAGRAM
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100
540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100
1260 RANKIN DRIVE, SUITE G | 248.850.8164
KALAMAZOO | GRAND RAPIDS | TROY

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
CAD NUMBER	-

NICET CERTIFIED LEVEL II
CERTIFICATION NO. 718532
APPROVED BY: Jeffrey Bristow
SIGNED:

APPROVED BY	
PRINT	
SIGN	
DATE	

MODULE & DEVICE WIRING DIAGRAMS

FA

3.1

4100-5451
IDNAC

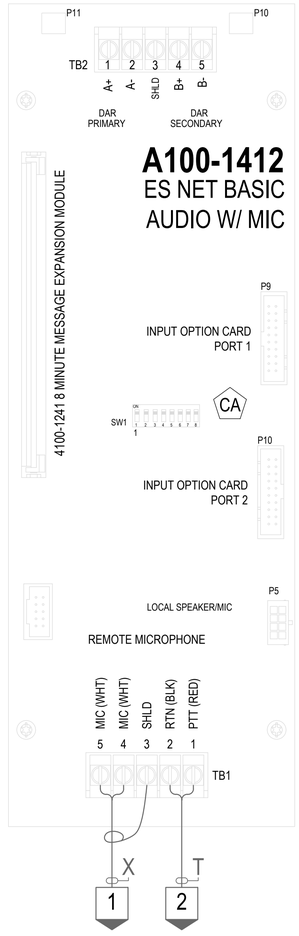
N1	1-N1	SOUTH OFFICE AREA	V
N2	1-N2	SOUTH CLASSROOMS	V
N3	1-N3	LIBRARY & GENERAL PURPOSE AREA	V

GEN	IDNAC-1 WIRING DIAGRAM
TYP	NOT TO SCALE

4100-5451
IDNAC

N1	2-N1	NORTHEAST CLASSROOMS	V
N2	2-N2	NORTHWEST CLASSROOMS	V

GEN	IDNAC-2 WIRING DIAGRAM
TYP	NOT TO SCALE



A100-1412
ES NET BASIC AUDIO W/ MIC

1	X:1	REMOTE MICROPHONE	X
2	X:2	PUSH TO TALK	T

GEN	DIGITAL AUDIO CONTROLLER WIRING DIAGRAM
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 | 269.381.2100
KALAMAZOO
540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 | 616.235.2100
GRAND RAPIDS
1260 RANKIN DRIVE, SUITE G | 248.850.8164
TROY

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

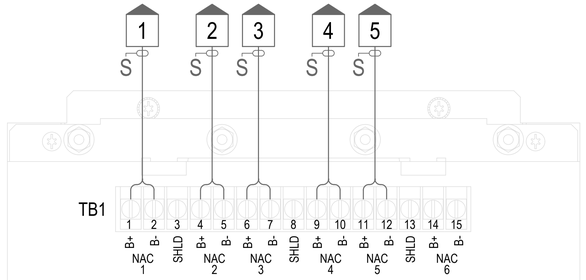
NICET CERTIFIED LEVEL III
CERTIFICATION NO. 718532
APPROVED BY: Jeffrey Bristow
SIGNED:

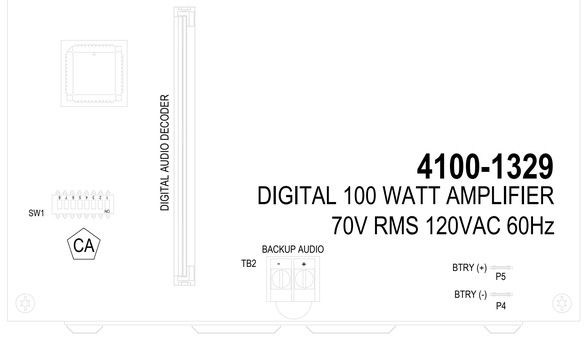
MODULE & DEVICE WIRING DIAGRAMS

APPROVED BY
PRINT
SIGN
DATE

FA

3.2

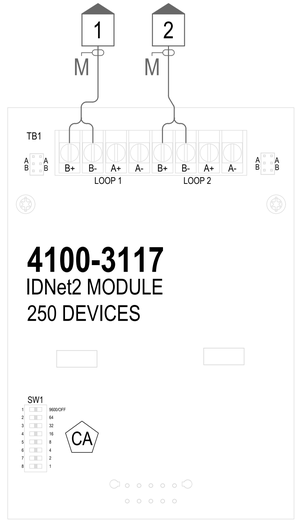




4100-1329
DIGITAL 100 WATT AMPLIFIER
70V RMS 120VAC 60Hz

1	1-SPK1	SOUTH OFFICE AREA	S
2	1-SPK2	SOUTH CLASSROOM AREA	S
3	1-SPK3	LIBRARY & GENERAL PURPOSE AREA	S
4	1-SPK4	NORTHEAST CLASSROOMS	S
5	1-SPK5	NORTHWEST CLASROOMS	S

GEN	100 WATT AMPLIFIER WIRING DIAGRAM
TYP	NOT TO SCALE



4100-3117
IDNet2 MODULE
250 DEVICES

1	IDNET-1	LOOP 1 - SOUTH BUILDING	M
2	IDNET-2	LOOP 2 - NORTH BUIDLING	M

GEN	IDNET2 WIRING DIAGRAM
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
KALAMAZOO 3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 269.381.2100
GRAND RAPIDS 545 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 616.235.2100
TROY 1260 RANKIN DRIVE, SUITE G 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	6771
QBD NUMBER	-

NICET CERTIFIED LEVEL III
CERTIFICATION NO. 119532
APPROVED BY: Jeffrey Erickson
SIGNED:

MODULE & DEVICE WIRING DIAGRAMS

APPROVED BY	
PRINT	
SIGN	
DATE	

FA

3.3

TrueAlert™ ES (STYLE 4/6 SLC) AUDIBLE/VISIBLE NOTIFICATION APPLIANCES 49AV SERIES A49VO–APPLC & –BA (MODEL NUMBERS ENDING IN –BA ARE ASSEMBLED IN USA)

PRODUCT INFORMATION

FEATURES:

INDIVIDUALLY ADDRESSED WALL MOUNT AUDIBLE/VISIBLE NOTIFICATION APPLIANCES WITH EFFICIENT ELECTRONIC HORN AND HIGH INTENSITY XENON STROBE PROVIDES:

- SUPERVISION OF EACH INDIVIDUAL APPLIANCE'S WIRING AND CONNECTIONS
- ABILITY TO CONNECT USING "T" TAPPING FOR CLASS B/STYLE 4 CLASS A/STYLE 6 CIRCUITS REQUIRE IN/OUT WIRING CIRCUITS TO SIMPLIFY WIRING
- HORNS CONTROLLED SEPARATELY FROM STROBES ON THE SAME 2–WIRE CIRCUIT ALLOWING "ON–UNTIL–SILENCED" AND "ON–UNTIL RESET" USING A SINGLE ADDRESS
- XENON STROBE OUTPUT IS MANUALLY SELECTABLE FOR 15, 30, 75, 110, 135 AND 185 CANDELA OR "FACP". THE "FACP" SETTING ALLOWS THE A100ES TO PROGRAM THE CANDELA SETTING.
- IN/OUT WIRING ACCESSIBILITY FROM FRONT OF HOUSING PROVIDES EASY ACCESS FOR INSTALLATION, INSPECTION, AND TESTING
- MAGNETIC TEST DIAGNOSTICS TO ASSIST CHECKOUT AND TESTING OF APPLIANCES AND WIRING
- UL LISTED TO STANDARD 1971 FOR STROBE
- UL LISTED TO STANDARD 464 FOR HORN

LED INDICATOR AND MAGNETIC TEST FEATURE:

- LED INDICATOR CAN BE ELECTED TO DISPLAY EACH POLLING CYCLE TO INDICATE APPLIANCE SUPERVISION
- WHEN THE TrueAlert CONTROLLER IS IN DIAGNOSTIC MODE, THE MAGNETIC TEST PULSES THE LED TO INDICATE APPLIANCE ADDRESS

CONFIRM OPERATION

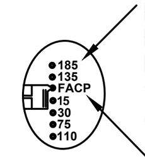
TrueAlert 2–WIRE ADDRESSABLE CONTROL OF VISIBLE AND AUDIBLE NOTIFICATION ACTIVATES APPLIANCES WITH:

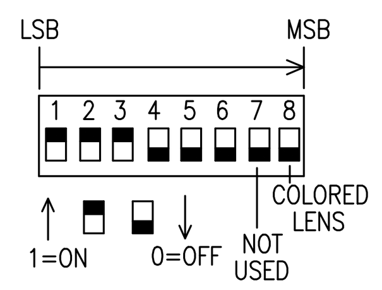
- HORNS SOUNDED AS TEMPORAL OR MARCH TIME PATTERN, OR ON CONTINUOUSLY

TrueAlert NOTIFICATION APPLIANCE DESIGN PROVIDES

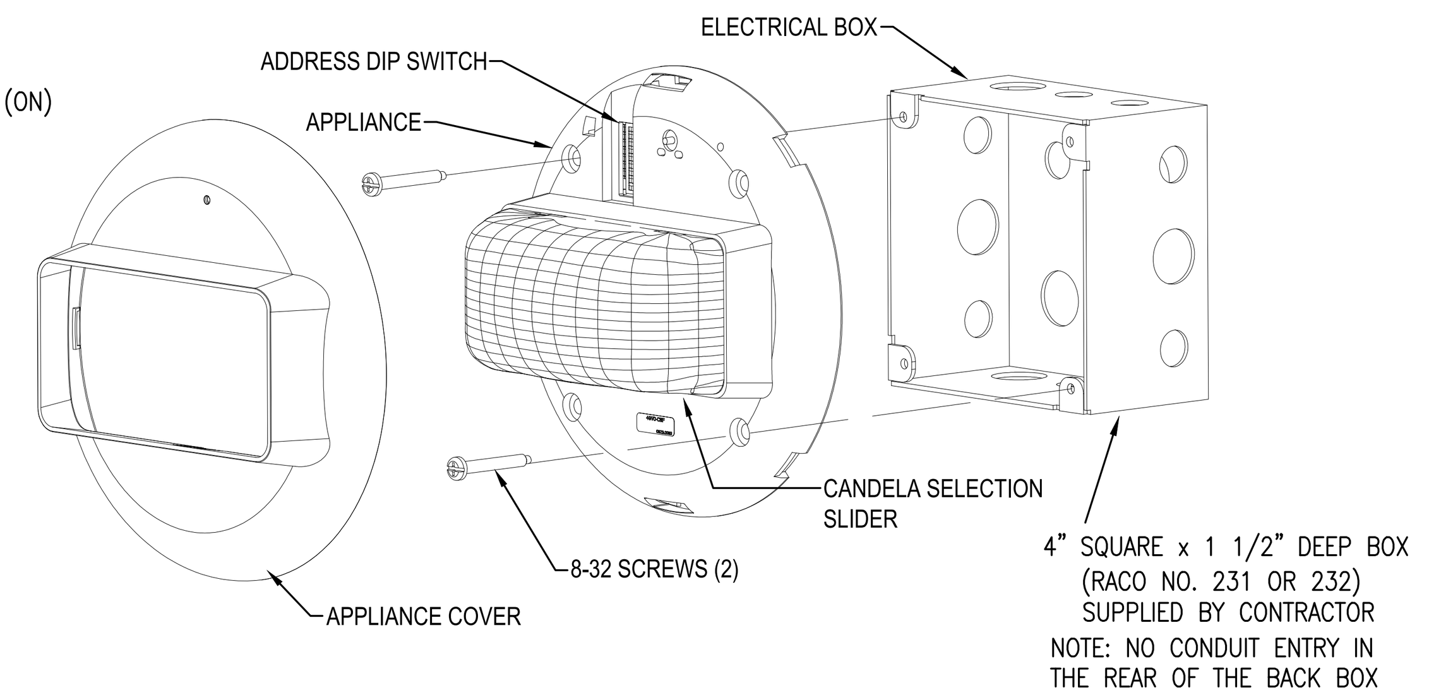
APPLIANCE CONFIGURATION SETTINGS

POSITION 1:	CONFIGURATION CONTROL – LOCAL (OFF), PANEL (ON)
POSITION 2:	AUDIBLE VOLUME – HIGH (OFF), LOW (ON)
POSITION 3:	CANADIAN HORN MODE – SET TO OFF
POSITION 4:	LEGACY NAC MODE – SET TO OFF
POSITION 5,6,7:	UNUSED – SET TO OFF
POSITION 8:	CLEAR/COLOR LENS – ALARM (OFF), ALERT (ON)





REFER TO TRUEALERT DIPSWITCH SETTINGS DETAIL FOR ADDRESS SETTINGS.



MOUNTING INSTRUCTIONS:

1. BRING THE BUILDING WIRING THROUGH THE RECTANGULAR OPENING IN THE BACKPLATE.
2. CONNECT THE BUILDING WIRES TO THE BACKPLATE.
3. SECURE THE BACKPLATE TO THE ELECTRICAL BOX BY USING THE PROVIDED HARDWARE. INSTALLED WITH THE WRITING "INSTALL THIS SIDE UP" AT THE TOP.
4. ATTACH THE COVER TO THE APPLIANCE.
5. SET THE APPLIANCE ADDRESS AND CONFIGURATION SETTINGS.
6. ATTACH THE ASSEMBLED APPLIANCE ONTO THE BACKPLATE.

SPECIFICATIONS:

STROBE:

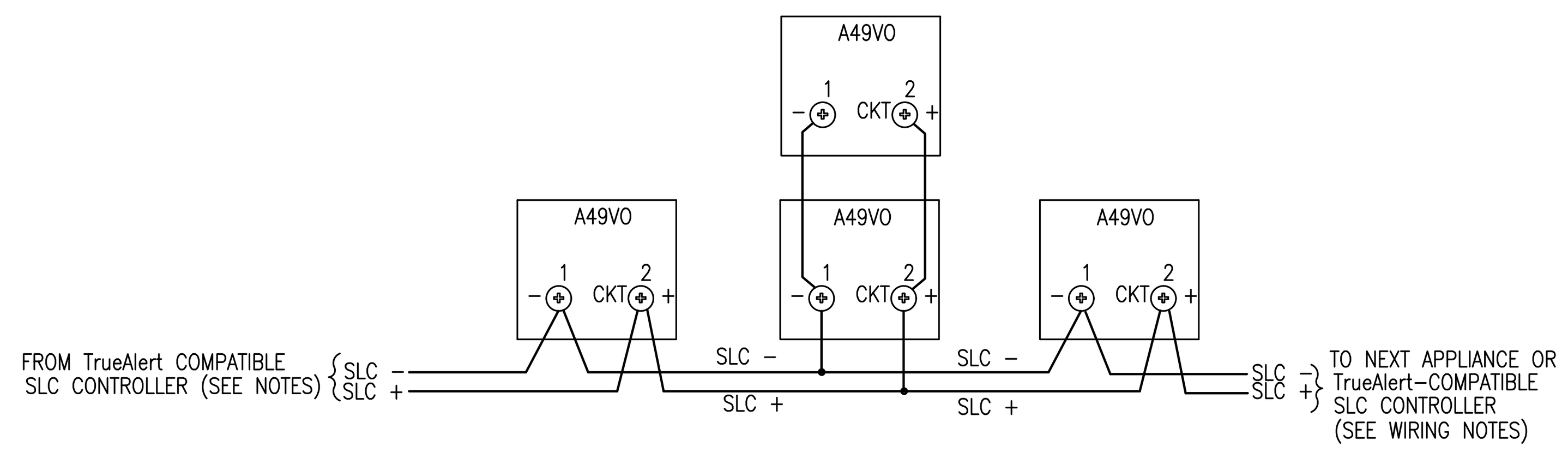
RATED VOLTAGE RANGE: 17 TO 31 VRMS
SUPERVISORY REQUIREMENTS: 1 UNIT LOAD
STROBE FLASH RATE: 1 Hz

Sound Output Dispersion per ULC S541 Anechoic Testing

Specification		Rating					
Horizontal		-3 dBA @ 30° at both left and right from center; -6 dBA @ 80° from center					
Vertical		-3 dBA @ 25° above and 35° below center; -6 dBA @ 65° above and below center					
	Candela Setting	15 cd	30 cd	75 cd	110 cd	135 cd	185 cd
49AV	23-30 VDC	67 mA	92 mA	159 mA	215mA	-	-
49AVH		-	-	-	300 mA	330 mA	391 mA
49AVH CD blue dome		-	75 mA	95 mA	110 mA	-	-
49AVH CD amber dome		-	95 mA	110 mA	135 mA	-	-

GENERAL SPECIFICATIONS:

TEMPERATURE RANGE: 32° TO 120° F (0° TO 49° C)
HUMIDITY RANGE: 10% TO 93% NON–CONDENSING AT 104° F (40° C)
CONNECTIONS: TERMINAL BLOCKS FOR 18 TO 12 AWG

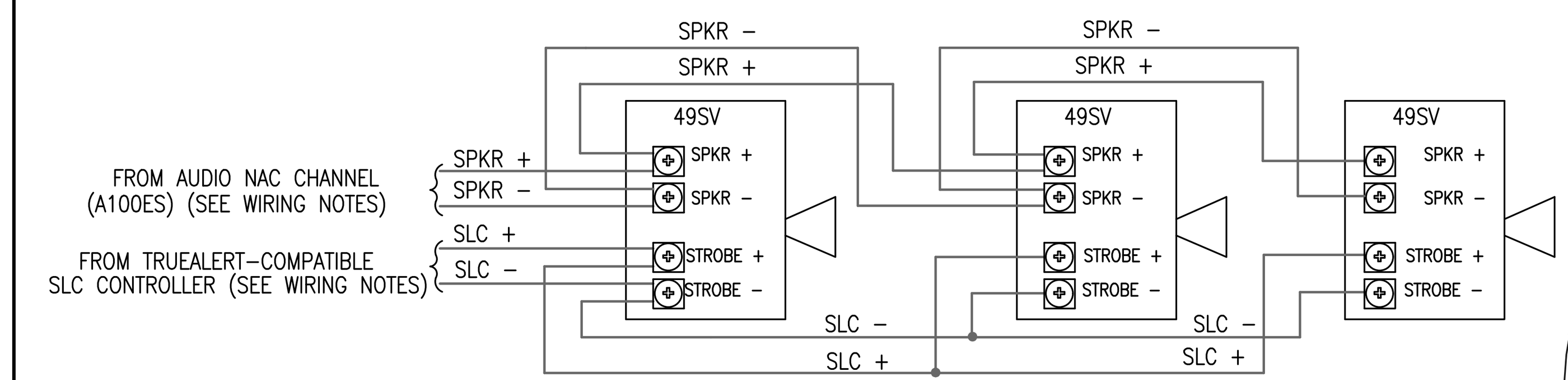


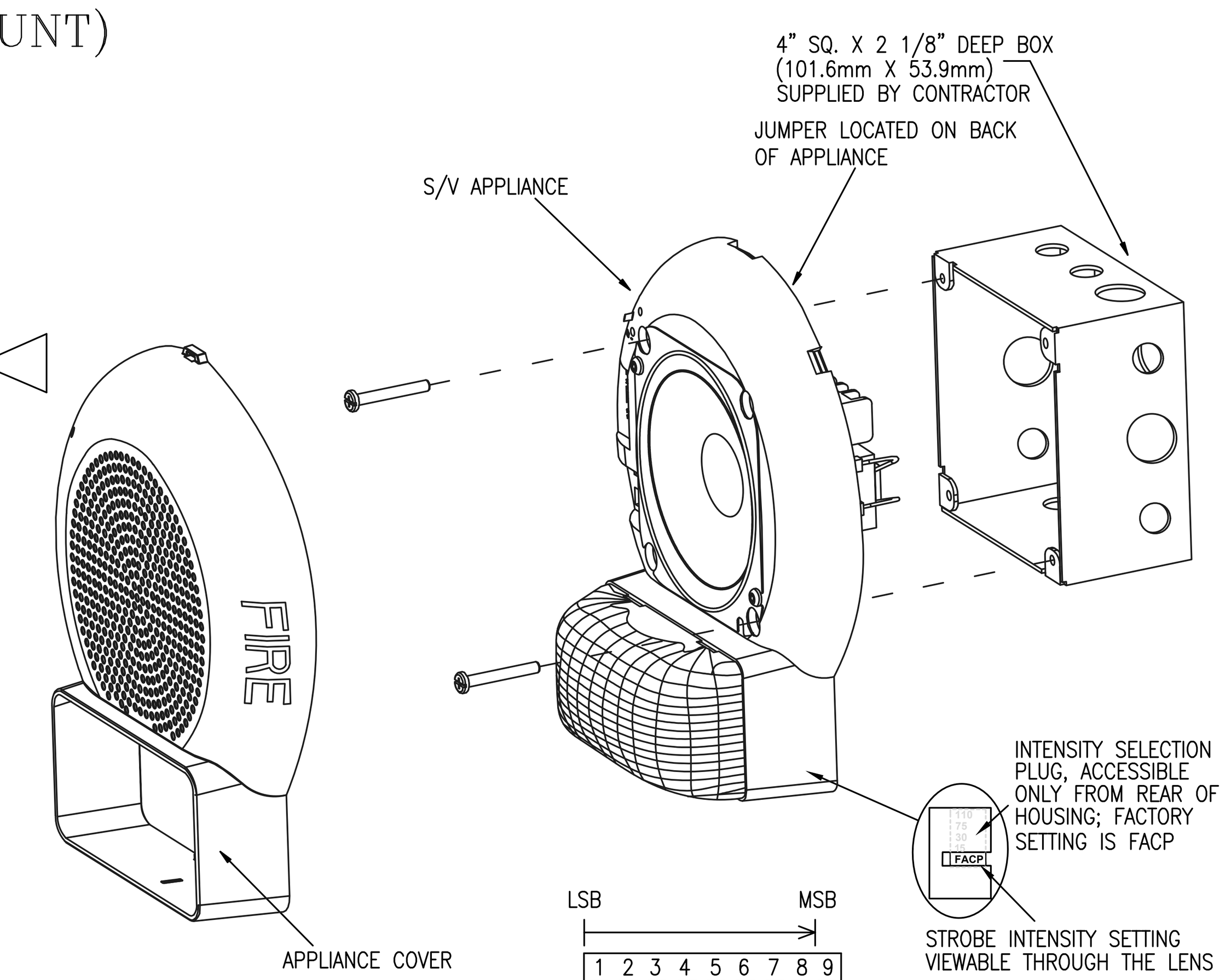
WIRING NOTES:

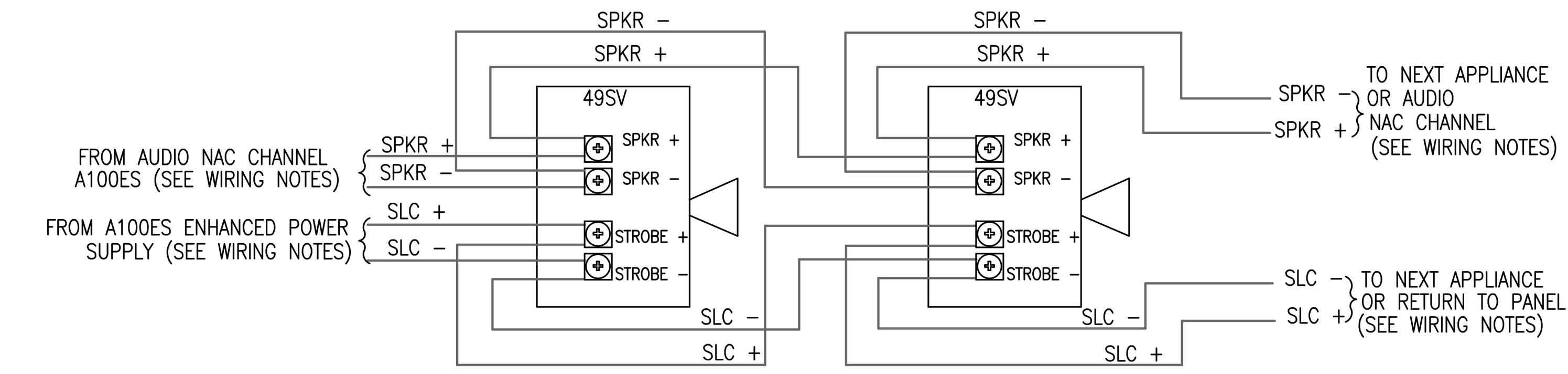
2. NOTIFICATION APPLIANCES ARE RATED PER INDIVIDUAL NAMEPLATE LABEL.
3. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS. DO NOT LOOP WIRES UNDER TERMINALS.
4. ALL TrueAlert SLC WIRING CONNECTIONS ARE SUPERVISED AND POWER–LIMITED.
5. POWERING THE A/V FROM AN APPLIANCE POWER SOURCE LESS THAN 17 VDC OR GREATER THAN 32 VDC MAY CAUSE PERMANENT DAMAGE. TO THE A/V UNIT.
6. THE TrueAlert A/V CAN ONLY BE OPERATED THROUGH A TrueAlert COMPATIBLE FACP.
7. T–TAPPING IS NOT ALLOWED FOR STYLE 6 WIRING.

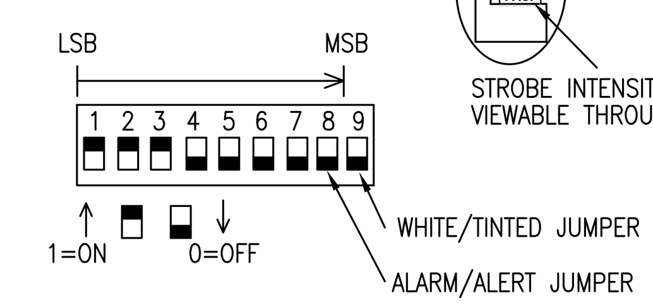
GEN	CEILING MOUNT STROBE WIRING DIAGRAM
TYP	NOT TO SCALE

TrueAlert ES ™ADDRESSABLE (STYLE 4/6) SPEAKER/VISIBLE NOTIFICATION APPLIANCES A49SV SERIES (CEILING MOUNT)









JUMPER POSITION	VOLTAGE	WATTAGE SETTING
J1 TO TAP A	70.7VRMS	1/4
J1 TO TAP B		1/2
J1 TO TAP C		1
J1 TO TAP D		2
J1 TO TAP E	25VRMS	1/4
J1 TO TAP F		1/2
J1 TO TAP G		1
J1 TO TAP H		2

WIRING NOTES:

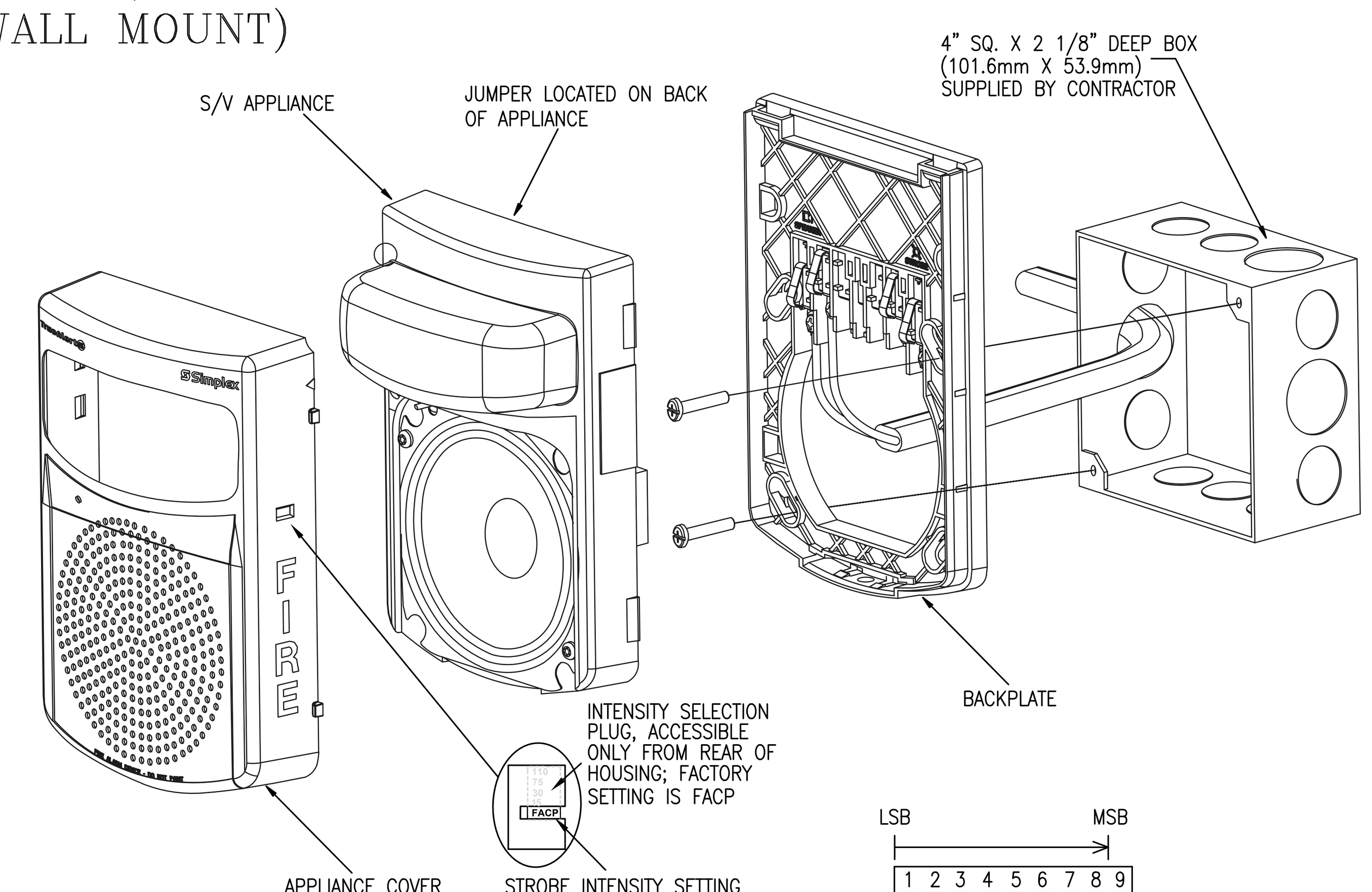
1. REFER TO FIELD WIRING DIAGRAMS OF THE DRIVING TrueAlert COMPATIBLE CONTROLLER FOR ADDITIONAL SLC WIRING INFORMATION. REFER TO THE FIELD WIRING DIAGRAMS SUPPLIED WITH THE A100ES FOR ADDITIONAL NAC WIRING INFORMATION.
2. NOTIFICATION APPLIANCES ARE RATED PER INDIVIDUAL NAMEPLATE LABEL.
3. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS. DO NOT LOOP WIRES UNDER TERMINALS.
4. ALL TrueAlert SLC AND NAC WIRING CONNECTIONS ARE SUPERVISED AND POWER–LIMITED.
5. POWERING THE S/V FROM AN APPLIANCE POWER SOURCE LESS THAN 23 VDC OR GREATER THAN 30 VDC MAY CAUSE PERMANENT DAMAGE TO THE S/V UNIT.
6. THE TrueAlert ES S/V CAN ONLY BE OPERATED THROUGH A A100ES ENHANCED POWER SUPPLY.
7. T–TAPPING IS NOT ALLOWED FOR STYLE 6 WIRING.

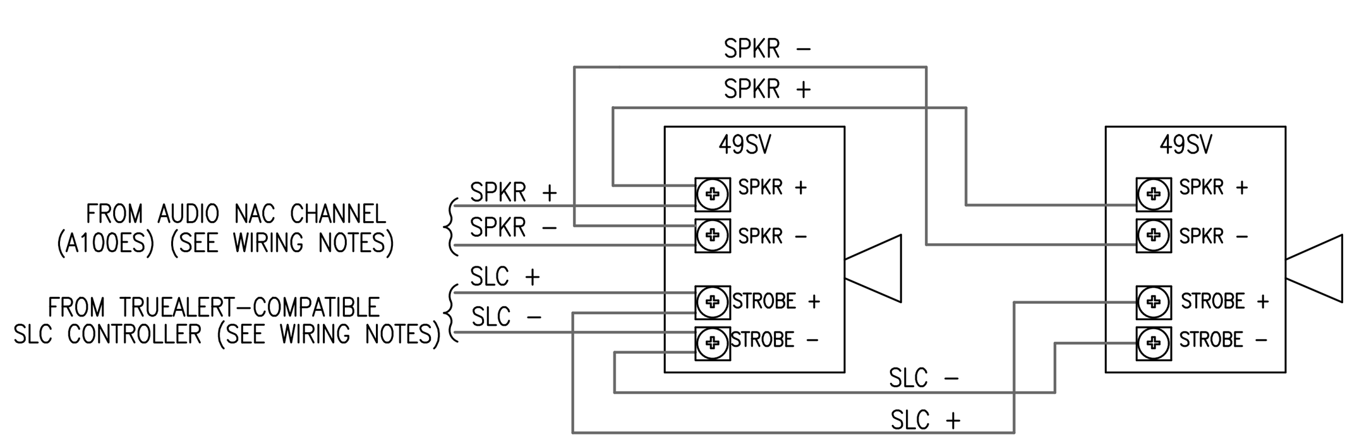
MOUNTING NOTES:

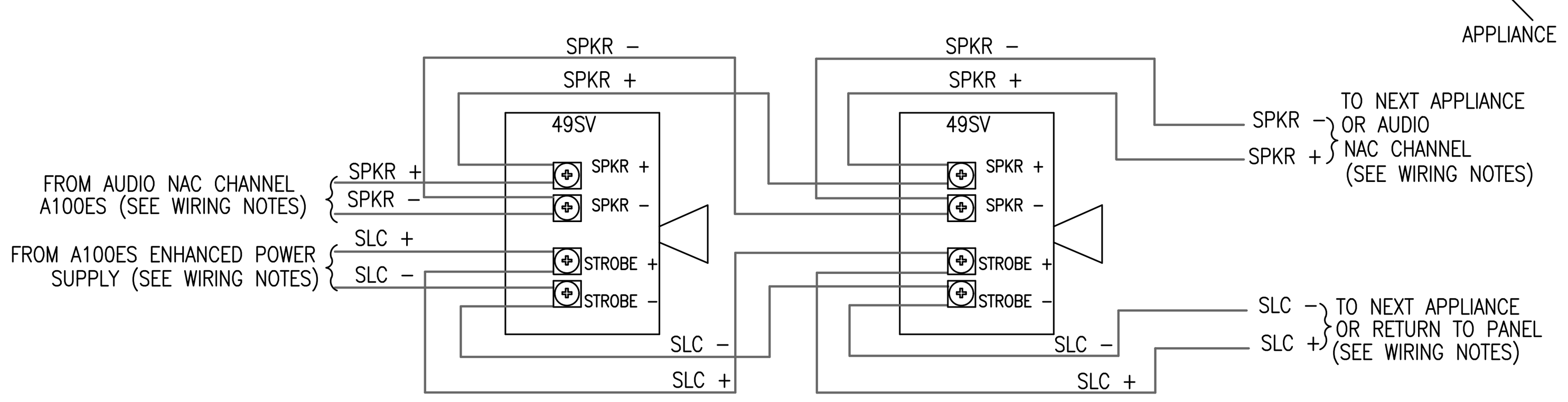
1. THE TrueAlert S/V ATTACHES DIRECTLY TO A STANDARD 4–INCH ELECTRICAL BOX (NOT SUPPLIED), FLUSH MOUNTED OR SURFACE MOUNTED.
2. THERE ARE FOUR HOLES FOR 4–INCH SQUARE ELECTRICAL BOX MOUNTING. SECURE THE HOUSING TO THE BOX USING TWO MOUNTING SCREWS. THE TWO MOUNTING SCREWS ARE PLACED CROSS CORNER (OPPOSITE TOP AND BOTTOM HOLES)
3. TO REMOVE THE COVER, PRESS THE SNAP RELEASE IN (ONE AT A TIME) WITH A FLAT TIP SCREWDRIVER WHILE PULLING UP THE COVER WITH THE OTHER HAND. ADDRESS SWITCH (SW1 IS ACCESSIBLE WITH THE COVER REMOVED).

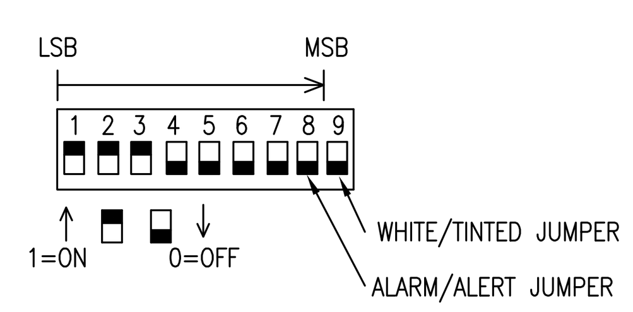
GEN	CEILING MOUNT SPEAKER / STROBE WIRING DIAGRAM
TYP	NOT TO SCALE

TrueAlert ES™ ADDRESSABLE (STYLE 4/6) SPEAKER/VISIBLE NOTIFICATION APPLIANCES A49SV SERIES (WALL MOUNT)









JUMPER POSITION	VOLTAGE	WATTAGE SETTING
J1 TO TAP A	70.7VRMS	1/4
J1 TO TAP B		1/2
J1 TO TAP C		1
J1 TO TAP D		2
J1 TO TAP E	25VRMS	1/4
J1 TO TAP F		1/2
J1 TO TAP G		1
J1 TO TAP H		2

WIRING NOTES:

1. REFER TO FIELD WIRING DIAGRAMS OF THE DRIVING TrueAlert COMPATIBLE CONTROLLER FOR ADDITIONAL SLC WIRING INFORMATION. REFER TO THE FIELD WIRING DIAGRAMS SUPPLIED WITH THE A100ES FOR ADDITIONAL NAC WIRING INFORMATION.
2. NOTIFICATION APPLIANCES ARE RATED PER INDIVIDUAL NAMEPLATE LABEL.
3. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS. DO NOT LOOP WIRES UNDER TERMINALS.
4. ALL TrueAlert SLC AND NAC WIRING CONNECTIONS ARE SUPERVISED AND POWER–LIMITED.
5. POWERING THE S/V FROM AN APPLIANCE POWER SOURCE LESS THAN 23 VDC OR GREATER THAN 30 VDC MAY CAUSE PERMANENT DAMAGE TO THE S/V UNIT.
6. THE TrueAlert ES S/V CAN ONLY BE OPERATED THROUGH A A100ES ENHANCED POWER SUPPLY.
7. T–TAPPING IS NOT ALLOWED FOR STYLE 6 WIRING.

MOUNTING NOTES:

1. THE TrueAlert S/V ATTACHES DIRECTLY TO A STANDARD 4–INCH ELECTRICAL BOX (NOT SUPPLIED), FLUSH MOUNTED OR SURFACE MOUNTED.
2. THERE ARE FOUR HOLES FOR 4–INCH SQUARE ELECTRICAL BOX MOUNTING. SECURE THE HOUSING TO THE BOX USING TWO MOUNTING SCREWS. THE TWO MOUNTING SCREWS ARE PLACED CROSS CORNER (OPPOSITE TOP AND BOTTOM HOLES)
3. TO REMOVE THE COVER, PRESS THE SNAP RELEASE IN (ONE AT A TIME) WITH A FLAT TIP SCREWDRIVER WHILE PULLING UP THE COVER WITH THE OTHER HAND. ADDRESS SWITCH (SW1 IS ACCESSIBLE WITH THE COVER REMOVED).

GEN	WALL MOUNT SPEAKER / STROBE WIRING DIAGRAM
TYP	NOT TO SCALE

KNIGHT WATCH®
WWW.KNIGHTWATCH.NET

KALAMAZOO	3005 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048	269.381.2100
GRAND RAPIDS	540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504	616.235.2100
TROY	1260 RANKIN DRIVE, SUITE G	248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY ECC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
ORD NUMBER	-

NICET® CERTIFIED LEVEL III
APPROVED BY: Jeffrey Bristow
CERTIFICATION NO: 118832
SIGNED: [signature]

APPROVED BY
PRINT
SIGN
DATE

FIELD DEVICE WIRING DIAGRAMS

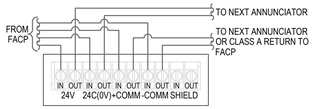
FA 4.1

TSD REMOTE DISPLAY

A4100-9404

WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.

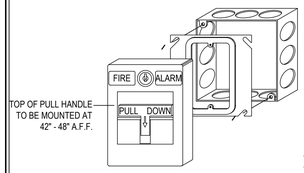


TERMINATION VIEW

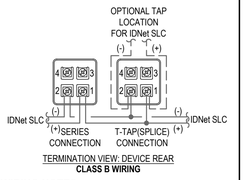
GEN	TSD REMOTE DISPLAY WIRING DIAGRAM
TYP	NOT TO SCALE

ADDRESSABLE PULL STATIONS

AUTOCALL A4099 SERIES



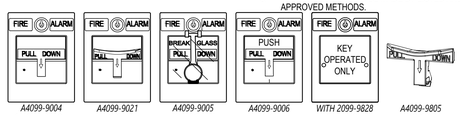
MOUNTING OPTION "B"



TERMINATION VIEW: DEVICE REAR
CLASS B WIRING

WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS.



A4099-9004 SINGLE ACTION | *A4099-9021 NO GRIP SINGLE ACTION* | *A4099-9005 BREAKGLASS* | *A4099-9006 PUSH* | *WITH 2099-9828 INSTITUTIONAL COVER KIT* | *A4099-9805 NO GRIP RETROFIT KIT*

MOUNTING OPTIONS

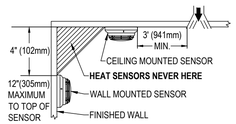
OPTION [1]	DESCRIPTION	NOTE
A	SINGLE GANG BOX, 2-1/2" (64mm) DEEP	BY OTHERS
B	4" (102mm) SQUARE BOX, 2-1/8" DEEP (MIN) W/ SINGLE GANG COVER PLATE 3/4" (19mm) EXTENSION	BY OTHERS
C	AUTOCALL 2975-9022 - 5H x 3-7/8"W x 2-3/16"D (127mm x 98mm x 56mm)	ORDERED SEPARATELY
D	AUTOCALL 2975-9178 - 5-3/4"H x 3-7/8"W x 2-3/16"D (132mm x 102mm x 56mm)	ORDERED SEPARATELY

1. FOR ADDITIONAL MOUNTING OPTIONS, DOWNLOAD DATA SHEET A4099-0005 FROM HTTP://WWW.AUTOCALL.COM

GEN	PULL STATION WIRING DIAGRAM
TYP	NOT TO SCALE

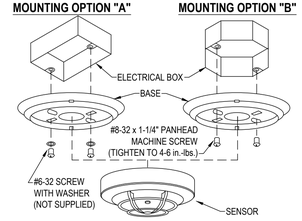
STANDARD SENSOR BASE

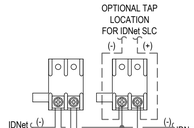
AUTOCALL A4098-9792



MOUNTING OPTION "A"

MOUNTING OPTION "B"





TERMINATION VIEW: DEVICE REAR
CLASS B WIRING

WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS.

MOUNTING OPTIONS

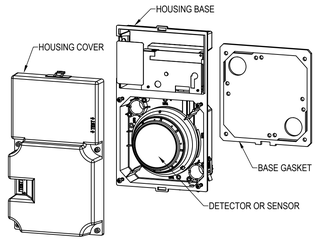
OPTION [1]	DESCRIPTION	NOTE
A	SINGLE GANG BOX, 2-1/8" (54mm) DEEP - FLUSH MOUNT	BY OTHERS
B	4" (102mm) OCTAGONAL BOX, 1-1/2" (38mm) DEEP, MINIMUM - FLUSH MOUNT	BY OTHERS
C	4" (102mm) SQUARE BOX, 1-1/2" DEEP (MIN) W/ AUTOCALL A4098-9832 ADAPTER KIT	BOX BY OTHERS, A4098-9832 ORDERED SEPARATELY
D	4" (102mm) SQUARE BOX, 1-1/2" DEEP (MIN) W/ SINGLE GANG COVER PLATE 3/4" (19mm) EXTENSION	BY OTHERS

1. FOR ADDITIONAL MOUNTING OPTIONS, DOWNLOAD DATA SHEET A4098-0019 FROM HTTP://WWW.AUTOCALL.COM

GEN	SMOKE / HEAT DETECTOR WIRING DIAGRAM
TYP	NOT TO SCALE

DUCT SMOKE DETECTOR

AUTOCALL A4098-9755 ANALOG 2-WIRE DUCT SENSOR



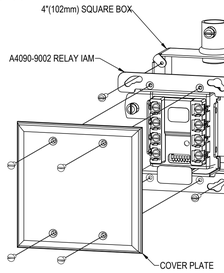
WIRING NOTES

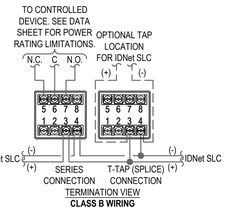
1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS. CLASS B APPLICATIONS ONLY.

GEN	SMOKE / HEAT DETECTOR WIRING DIAGRAM
TYP	NOT TO SCALE

ADDRESSABLE RELAY MODULE

AUTOCALL A4090-9002





TERMINATION VIEW
CLASS B WIRING

MOUNTING OPTION "A"

WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS.

MOUNTING OPTIONS

OPTION [1]	DESCRIPTION	NOTE
A	4" (102mm) SQUARE BOX, 2-1/8" MINIMUM DEPTH WITH DOUBLE GANG COVER PLATE	BY OTHERS
B	4" (102mm) SQUARE BOX, 2-1/8" MINIMUM DEPTH WITH AUTOCALL A4090-9801 TRIM PLATE FOR SEMI-FLUSH MOUNTED BOX	BOX BY OTHERS, PLATES ORDERED SEPARATELY
C	4" (102mm) SQUARE BOX, 2-1/8" MINIMUM DEPTH WITH AUTOCALL A4090-9802 TRIM PLATE FOR SURFACE MOUNTED BOX	BOX BY OTHERS, PLATES ORDERED SEPARATELY

1. FOR ADDITIONAL MOUNTING OPTIONS, DOWNLOAD DATA SHEET A4090-0002 FROM HTTP://WWW.AUTOCALL.COM

GEN	RELAY MODULE WIRING DIAGRAM
TYP	NOT TO SCALE

REMOTE ALARM INDICATOR/KEY SWITCH

FEATURES:

- UL LISTED
- CALIFORNIA STATE FIRE MARSHAL LISTING NUMBERS: A2908-9806 ALARM INDICATOR 7300-0026:150
- MOUNTING: FLUSH
- FINISH: CHROME OR STAINLESS STEEL

SPECIFICATIONS:

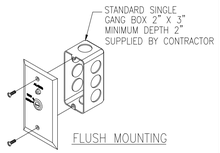
- ALARM CURRENT: 2.8 mA
- DIMENSIONS OF BOX: 2 "W X 3"H X 2"D

DESCRIPTION:

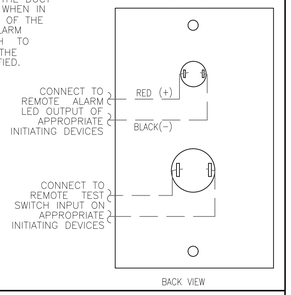
A2098-9806 REMOTE TEST STATION, PROVIDES A REMOTE RED ALARM LED STATUS INDICATOR AND A REMOTE TEST KEY ACTIVATED SWITCH MOUNTED ON A SINGLE GANG STAINLESS STEEL PLATE. THE LED WILL PULSE TO INDICATE NORMAL OPERATION OF THE DUCT DETECTOR AND WILL ENERGIZE CONTINUOUS WHEN IN ALARM OR IN TROUBLE. (THE EXACT STATUS OF THE SENSOR WILL BE DISPLAYED AT THE FIRE ALARM CONTROL PANEL.) TURNING THE TEST SWITCH TO "TEST" WILL INITIATE AN ALARM AND ALLOW THE RESULTING SYSTEM RESPONSES TO BE VERIFIED.

WIRING:

- MINIMUM 18 AWG OR TO LOCAL CODE.
- CONDUCTORS MUST TEST FREE OF ALL GROUNDS.
- REMOTE ALARM LED IS POLARIZED, OBSERVE COLOR CODED WIRING.
- ONE INDICATOR MAY BE INSTALLED PER DETECTOR.



FLUSH MOUNTING



BACK VIEW

GEN	REMOTE ALARM INDICATOR WIRING DIAGRAM
TYP	NOT TO SCALE

KNIGHT WATCH.
WWW.KNIGHTWATCH.NET
KALAMAZOO: 3305 BUSINESS ONE DRIVE, KALAMAZOO, MI 49048 — 269.381.2100
GRAND RAPIDS: 540 LEONARD ST NW, SUITE G, GRAND RAPIDS, MI 49504 — 616.235.2100
TROY: 1260 RANKIN DRIVE, SUITE G — 248.850.8164

REV	CAD DESIGNER	REVISIONS PERFORMED	DATE
0	LOUIS MUSZYNSKI	ORIGINAL SUBMITTAL	7/1/2024
1		CLARIFICATION 1 UPDATE	11/11/24

PROJECT INFORMATION

PROJECT	DUDLEY EOC
ADDRESS	315 WEST GOODALE
CITY, STATE, ZIP	BATTLE CREEK, MI 49037
PROJECT MANAGER	LEE SPILLMAN
PROJECT TYPE	FIRE ALARM
EST NUMBER	16771
CAD NUMBER	-

NICET CERTIFIED LEVEL III — CERTIFICATION NO. 718532 — APPROVED BY: Jeffrey Bristow — SIGNED:

APPROVED BY
PRINT
SIGN
DATE

FIELD DEVICE WIRING DIAGRAMS

FA

4.2

BATTLE CREEK PUBLIC SCHOOLS
DUDLEY ELEMENTARY
FIRE ALARM SYSTEM

Johnson Controls

BATTLE CREEK PUBLIC SCHOOLS

DRAWING INDEX

Sheet List Table

Sheet Number	Sheet Title	REV#
General Information (FA-000 Series)		
FA-001	COVER SHEET	2
FA-002	JOHNSON CONTROLS REQUIREMENTS	2
Floorplans (FA-100 Series)		
FA-101	FLOOR PLAN	2
Risers (FA-200 Series)		
FA-201	RISER DIAGRAM	2
Panel Details (FA-500 Series)		
FA-501	PANEL TERMINATIONS	1
Calculations (FA-600 Series)		
FA-601	PANEL INFORMATION	2
Typical Details (FA-700 Series)		
FA-701	4010 CUT SHEETS	1
FA-702	TYPICAL DETAILS	2
FA-703	TYPICAL DETAILS	2

LEGENDS

FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	BRAND	MODEL	BACKBOX	WIRE TYPE
PANELS					
FACP	4010 FIRE ALARM CONTROL PANEL, 120 VAC, BEIGE	SIMPLEX	4010-9101	SIMPLEX CABINET	N/A
INITIATING DEVICES					
SD	ADDRESSABLE PHOTOELECTRIC SMOKE SENSOR W/ STANDARD BASE	SIMPLEX	4098-9714 HEAD 4098-9792 BASE	4" OCT, 1-1/2" D	M
F	ADDRESSABLE MANUAL PULL STATION	SIMPLEX	4099-9003	4" SQ, 2-1/8" D W/ 3/4" SINGLE GANG COVER EXTENSION	M
WG =	WIRE GUARD, RED		2099-9800		
DD	SSD SENSOR DUCT HOUSING W/ RELAY OUTPUT	SIMPLEX	4098-9753	MOUNTED TO DUCTWORK	M P
	PHOTOELECTRIC SMOKE SENSOR	SIMPLEX	4098-9714		
	SAMPLING TUBE, 49"	SIMPLEX	2098-9797		
R S	ADDRESSABLE DUCT SMOKE DETECTOR W/ RELAY OUTPUT	SIMPLEX	4098-9756	MOUNTS TO DUCTWORK	M P
	SAMPLING TUBE, 73"	SIMPLEX	4098-9857		
WP =	WEATHERPROOF ENCLOSURE	SIMPLEX	4098-9845		
MODULES AND RELAYS					
R	TRACK MOUNTED SINGLE RELAY DPDT W/O ENCLOSURE, APOLLO AMERICA INC MR-201/T	SIMPLEX	2088-9009	TRACK MOUNT, WITHOUT ENCLOSURE	R
P	ENCAPSULATED RELAY	SIMPLEX	4098-9843	SINGLE GANG 2-1/8" D W/ COVER	R
NOTIFICATION APPLIANCES					
A/V	CONVENTIONAL 75-CANDELA HORN/STROBE, WALL MOUNT, RED, CLEAR LENS, FIRE	SIMPLEX	4903-9418	4" SQ. 1-1/2" D	V
WG =	WIRE GUARD, WALL, RED	SIMPLEX	4905-9961		
S	CONVENTIONAL 75-CANDELA STROBE, WALL MOUNT, RED, CLEAR LENS, FIRE	SIMPLEX	4904-9332	SINGLE GANG 1-1/2" D	V
MISCELLANEOUS DEVICES					
RT	REMOTE TEST STATION	SIMPLEX	2098-9806	SINGLE GANG 2"D	K
#K	END-OF-LINE RESISTOR 3.3kΩ, 1W (EOL)	SIMPLEX	4081-9002		
	END-OF-LINE RESISTOR 4.7kΩ, 1/2W (EOL)		4081-9003		
	END-OF-LINE RESISTOR 6.8kΩ, 1/2W (EOL)		4081-9004		
	END-OF-LINE RESISTOR 10kΩ, 1/2W (EOL)		4081-9008		

FIRE ALARM WIRE LEGEND

	CIRCUIT DESCRIPTION	CONSTRUCTION	GAUGE	CIRCUIT PROPERTIES	FPLR	FPLP	THHN	TFFN	OUTDOOR **	C.I.
					ACCEPTABLE CABLE TYPES					
K	REMOTE TEST SWITCH/LED	(2) 2 COND. SOLID	14 AWG		X	X				
M	MAPNET/IDNET	STP SOLID	18 AWG	0.60µF MAX TOTAL LINE CAPACITANCE	X	X				
P	POWER	2 COND. SOLID	14 AWG		X	X	X	X		
R	RELAY	2 COND. SOLID	14 AWG		X	X	X	X		
V	VISUAL	2 COND. SOLID	14 AWG		X	X				

CONDUIT SIZE	MAX CONDUCTOR AREA	CONDUIT SIZE	MAX CONDUCTOR AREA
1/2"	0.122 SQ. INCH*	1-1/4"	0.598 SQ INCH*
3/4"	0.213 SQ INCH*	1-1/2"	0.814 SQ INCH*
1"	0.346 SQ INCH*	2"	1.342 SQ INCH*

* 40% CONDUIT FILL PER N.E.C.

STP = SHIELDED TWISTED PAIR

ITEMS SUCH AS CAPACITANCE BETWEEN CONDUCTORS AND WIRE GAUGE CAN BE CRUCIAL TO THE CIRCUIT DESIGN OF THIS SYSTEM INSTALLATION. THE INSTALLING CONTRACTOR IS RESPONSIBLE FOR SELECTING AND INSTALLING CABLE MANUFACTURER AND MODEL THAT MEETS OR EXCEEDS THE ABOVE REQUIREMENTS. RECOMMENDED CABLE MANUFACTURERS AND MODEL NUMBERS ARE AVAILABLE UPON REQUEST.

APPLICABLE CODES & STANDARDS

JURISDICTIONS WITHIN THE STATE MAY HAVE AMENDMENTS TO THE STATE ADOPTED CODE. CHECK WITH THE LOCAL JURISDICTION AUTHORITY FOR MORE DETAILS.

Life Safety Code (NFPA 101), 2014 Edition

National Fire Alarm Code (NFPA 72), 2010 Edition

National Electric Code (NFPA 70), 2011 Edition

2014 Michigan Electrical Code Rules, Part 8

ASME A17.1-2010 (Safety code for elevators and escalators)

ASME A18.1-2011 (Safety code standard for platform lifts and stairway chairlifts)

ASME A17.2-2012 (Safety code standard for inspection of elevator, escalators, and moving walks)

ASME A90.1-2009 (Safety code standard for belt manlifts)

A10.4-2007 (Safety requirements for personnel hoists and employee elevators for construction and demolition operations)

OCCUPANCY TYPE(S):
E EDUCATIONAL GROUP

SPRINKLER PROTECTION:
UNKNOWN

JOHNSON CONTROLS CONTACTS

Sales Representative
CLIFF GRIFFIN
CLIFFORD.GRIFFIN@JCI.COM
PHONE: 248-755-9054

Drawings Prepared By
ADAM BUCK
ADAM.BUCK@JCI.COM
PHONE: 616-262-6547

Project Manager
TINE OSENTOSKI
CHRISTINE.OSENTOSKI@JCI.COM
PHONE: 248-640-0453

Drawings Reviewed By
STEVE POSTEMA
STEVEN.POSTEMA@JCI.COM
PHONE: 616-802-3353

Scheduling
TINE OSENTOSKI
CHRISTINE.OSENTOSKI@JCI.COM
PHONE: 248-640-0453

SCOPE OF WORK

MODIFY EXISTING FIRE ALARM SYSTEM: PROVIDE NEW DEVICES, RELOCATE AND DEMO EXISTING DEVICES AS SHOWN ON DRAWINGS.

ALL NEW WIRING TO BE CLASS B.

THE EXISTING FIRE ALARM SYSTEM SHALL NOT BE DISCONNECTED OR TAKEN OUT OF SERVICE WITHOUT WRITTEN PERMISSION FROM THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE OWNER THE TIMING OF ANY EXISTING FIRE ALARM SYSTEM DEMOLITION WORK.

DESIGN STATEMENT

THIS PROJECT'S DESIGN IS BASED ON THE ENGINEERED PLANS AND SPECIFICATIONS PREPARED BY:
C2AE ARCHITECTURE & ENGINEERING

ARCHITECTURAL PLANS DATED:
MECHANICAL PLANS DATED: 08/26/22
ELECTRICAL PLANS DATED: 08/26/22
SPECIFICATIONS DATED:
ADDENDUM DATED:

PROJECT DIRECTORY

Site
DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

Johnson Controls District - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
PHONE: 248-427-5050
FAX: 248-426-6655
SERVICE: 800-343-9797

Engineer Of Record
C2AE ARCHITECTURE & ENGINEERING
648 MONROE AVE NW
GRAND RAPIDS, MI 49503

Installer
UNION ELECTRIC INC.
109 ELM STREET
BATTLE CREEK, MI 49017

CONTACT: KEN FELLER

Owner
BATTLE CREEK PUBLIC SCHOOLS
3 VAN BUREN WEST
BATTLE CREEK, MI 49017

ABBREVIATIONS LEGEND

AC = ABOVE CEILING
AFF = ABOVE FINISHED FLOOR
AHJ = AUTHORITY HAVING JURISDICTION
ALM = ALARM
ANN = ANNUNCIATOR
BMS = BUILDING MANAGEMENT SYSTEM
C = CEILING MOUNTED
CD = CANDELA RATING
DET = DETECTOR
DGP = DATA GATHERING PANEL
E = EXISTING TO REMAIN
EOL = END OF LINE
EPO = EMERGENCY POWER OFF
ER = ELEVATOR RECALL
FAA = FIRE ALARM ANNUNCIATOR
FACP = FIRE ALARM CONTROL PANEL
FATC = FIRE ALARM TERMINAL CABINET
FBO = FURNISHED BY OTHERS
FCC = FIRE COMMAND CENTER
FSD = FIRE SMOKE DAMPER
FTR = FIRE ALARM TRANSPONDER
H = HIGH HUMIDITY
HT = HEIGHT
HVAC = HEATING VENTILATION AIR CONDITIONING
IMS = INFORMATION MANAGEMENT SYSTEM
MAX = MAXIMUM
MIN = MINIMUM
N/A = NOT APPLICABLE
NAC = NOTIFICATION APPLIANCE CIRCUIT
NDU = NETWORK DISPLAY UNIT
NEC = NATIONAL ELECTRIC CODE
NFPA = NATIONAL FIRE PROTECTION ASSOCIATION
NIC = NOT IN CONTRACT
NPU = NETWORK PROCESSING UNIT
NTS = NOT TO SCALE
PAP = PRE-ACTION PANEL
RC = EXISTING TO REMOVE AND COVER
RD = EXISTING DEVICE TO BE RELOCATED
RL = RELOCATED DEVICE
RR = REMOVE EXISTING & REPLACE WITH NEW
SCC = STATUS COMMAND CENTER
SLC = SIGNALING LINE CIRCUIT
SMK = SMOKE
SUPV = SUPERVISORY
TAC = TRUEALERT ADDRESSABLE CONTROLLER
TOS = TOP OF SHAFT
TRBL = TROUBLE
TS = TAMPER SWITCH
TYP = TYPICAL
UON = UNLESS OTHERWISE NOTED
VCC = VOICE COMMAND CENTER
VT = VALVE TAMPER
W = WATTAGE
W/ = WITH
W/O = WITHOUT
WF = WATERFLOW
WG = WIRE GUARD
WP = WEATHERPROOF
XP = EXPLOSION PROOF

FOR REFERENCE ONLY

DEVICE TAG LEGEND

1:T2:A2-1(E1:1)

PANEL DESIGNATOR
- FA: = FACP (NON-NETWORK)
- #: = NODE NUMBER
- T#: = TRANSPONDER NUMBER
- #:T# = NODE:TRANSPONDER NUMBER
- N#: = NAC EXTENDER NUMBER

CIRCUIT DESIGNATOR
- A# = IDNAC[1] CIRCUIT NUMBER
- D# = DOOR HOLDER CIRCUIT NUMBER
- F# = FIRE PHONE CIRCUIT
- H# = AUDIBLE (HORN) CIRCUIT NUMBER
- M# = IDNET LOOP NUMBER
- P# = POWER CIRCUIT NUMBER
- S# = SPEAKER CIRCUIT NUMBER
- V# = VISUAL CIRCUIT NUMBER
- Z# = ZONE NUMBER

DEVICE NUMBER

BRANCH / ISOLATED LOOP DESIGNATOR:
- (L#) = IDNET ISOLATED LOOP NUMBER
- (#) = IDNAC BRANCH NUMBER
- (E#:#) = EPR[2] NUMBER:BRANCH NUMBER

1. IDNAC = ADDRESSABLE NOTIFICATION CIRCUIT
2. EPR = ENHANCED POWER REPEATER

SYSTEM SEQUENCE OF OPERATIONS

SYSTEM OUTPUTS: A = ACTUATE COMMON ALARM SIGNAL INDICATOR; B = ACTUATE AUDIBLE ALARM SIGNAL; C = ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR; D = ACTUATE AUDIBLE SUPERVISORY SIGNAL; E = ACTUATE COMMON TROUBLE SIGNAL INDICATOR; F = ACTUATE AUDIBLE TROUBLE SIGNAL; G = ACTUATE APPROPRIATE LOCATION INDICATOR (CTRL UNIT ANNUNCIATION); H = ACTUATE ALL AUDIBLE EVACUATION SIGNALS; I = ACTUATE ALL VISIBLE EVACUATION SIGNALS; J = UNUSED; K = DISPLAY CHANGE OF STATUS; L = TRANSMIT ALARM SIGNAL TO SUPERVISING STATION; M = TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION; N = TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION (NOTIFICATION); O–T = UNUSED; U = FAN SHUTDOWN (FIRE SAFETY CONTROL)

	SYSTEM INPUTS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	SMOKE SENSOR/DETECTOR	X	X					X	X	X		X	X									
2	MANUAL PULL STATION	X	X					X	X	X		X	X									
3	DUCT SENSOR/DETECTOR - SUPERVISORY			X	X			X				X		X								X
4	FIRE ALARM AC POWER FAILURE					X	X					X			X							
5	FIRE ALARM SYSTEM LOW BATTERY					X	X					X			X							
6	OPEN CIRCUIT OR GROUND FAULT					X	X					X			X							
7	CLASS B NOTIFICATION CIRCUIT (NAC) - SHORT					X	X					X			X							

GENERAL NOTES

1. THESE DRAWINGS DEPICT GENERAL LOCATIONS OF LIFE SAFETY EQUIPMENT & FIELD DEVICES. EXACT ROUTING OF CONDUITS IS TO BE DETERMINED IN THE FIELD BY THE INSTALLING CONTRACTOR TO SUIT CONDITIONS. ALL CHANGES SHALL BE CLEARLY INDICATED ON THE RECORD DRAWINGS.
2. SHOULD ANY CONDITIONS EXIST THAT DIFFER FROM WHAT IS INDICATED ON THESE DRAWINGS WHICH CAUSE MAJOR DEVIATIONS IN THE WORK SHOWN, THE CONTRACTOR SHALL CONTACT JOHNSON CONTROLS IN A TIMELY MANNER SO AS NOT TO IMPAIR THE CONSTRUCTION SCHEDULE.
3. CONTRACTOR IS RESPONSIBLE FOR MAKING AND OBTAINING APPROVAL FOR ALL NECESSARY ADJUSTMENTS IN CIRCUITING AS REQUIRED TO ACCOMMODATE THE RELOCATION OF EQUIPMENT AND/OR DEVICES WHICH ARE AFFECTED BY ANY AUTHORIZED CHANGE. ALL CHANGES SHALL BE CLEARLY INDICATED ON THE RECORD DRAWINGS.
4. A STAMPED SET OF APPROVED FIRE ALARM DRAWINGS SHALL BE AT THE JOB SITE AND SHALL BE USED FOR INSTALLATION.
5. THE POWER CIRCUIT TO THE FACP AND TO THE FIRE ALARM POWER SUPPLIES SHALL BE ON A DEDICATED 120V, 20A BRANCH CIRCUIT BREAKER, AND SHALL HAVE A RED MARKING, LOCK-ON PROVISION AND SHALL BE IDENTIFIED AS "FIRE ALARM CIRCUIT CONTROL." THE LOCATION OF THE CIRCUIT DISCONNECT MEANS (CIRCUIT BREAKER) SHALL BE PERMANENTLY IDENTIFIED AT THE FIRE ALARM CONTROL UNIT.
6. UPDATE THE AS-BUILT DRAWING SET DAILY WITH JOB PROGRESS. RETURN THE AS-BUILT DRAWING SET TO JOHNSON CONTROLS NO LATER THAN 7 DAYS AFTER FINAL TEST.
7. THE CONTRACTOR WILL MAINTAIN ALL AREAS OF THE BUILDING IN A NEAT AND WORKMANLIKE MANNER.
8. DO NOT APPLY POWER EXCEPT IN THE PRESENCE OF A FACTORY TRAINED JOHNSON CONTROLS TECHNICAL REPRESENTATIVE.
9. ANY SMOKE DETECTOR HEAD INSTALLED BEFORE THE BUILDING IS CLEANED AND ACCEPTED SHALL BE COVERED TO PROTECT FROM DUST. ANY FALSE ALARMS DUE TO DIRT CONTAMINATED HEADS SHALL BE THE RESPONSIBILITY OF THE FIRE ALARM INSTALLER.
10. THE FIRE ALARM INSTALLER WILL MAINTAIN THE FIRE RESISTANCE INTEGRITY OF ALL WALL, CEILING, AND ROOF ASSEMBLIES ANY TIME THAT WORK IS NOT ACTIVELY BEING PERFORMED.
11. INSTALLATION OF DEVICES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. POWER LIMITED AND NON-POWER LIMITED FIELD WIRING MUST BE INSTALLED WITHIN THE FACP ENCLOSURE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPLICABLE ELECTRICAL CODES. REFER TO 'APPLICABLE CODES & STANDARDS' FOR SPECIFIC CODE REFERENCES.
12. ALL WIRING SHALL BE INSTALLED ACCORDING TO APPLICABLE ELECTRICAL CODES.
13. FIRE ALARM CIRCUITS SHALL BE IDENTIFIED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES. MARK ALL FIRE ALARM WIRES IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODE SECTIONS FOR POWER LIMITED AND NON-POWER LIMITED WIRE.
14 FIRE ALARM CABLE INSTALLED IN DUCTS, PLENUM, AND OTHER SPACES USED FOR ENVIRONMENTAL AIR SHALL BE TYPE FPLP.
15. FIRE ALARM CABLE INSTALLED IN THE VERTICAL RUNS AND PENETRATING MORE THAN ONE FLOOR OR CABLES INSTALLED IN VERTICAL RUNS IN SHAFTS SHALL BE TYPE FPLR.
16. FIRE ALARM CABLE INSTALLED IN UNDERGROUND CONDUIT OR OTHER WET LOCATIONS SHALL BE UL LISTED FOR WET LOCATIONS.
17. FIRE ALARM CIRCUITS EXTENDING BEYOND ONE BUILDING AND RUN OUTDOORS SHALL BE INSTALLED IN ACCORDANCE APPLICABLE ELECTRICAL CODES, WHERE APPLICABLE.
18. ALL WIRING, INCLUDING SHIELDS MUST BE DRY AND FREE OF SHORTS AND GROUNDS.
19. ALL SHIELDED WIRE MUST HAVE SHIELD CONTINUITY AT FULL LENGTH OF THE WIRE.
20. ONLY SYSTEM WIRING CAN BE RUN IN THE SAME CONDUIT.
21. 120VAC IS NOT PERMITTED IN THE SAME CONDUIT WITH LOW VOLTAGE WIRING.
22. MAINTAIN MAXIMUM CONDUIT FILL RATIO AS PER APPLICABLE ELECTRICAL CODES REQUIREMENTS.
23. EXISTING CONDUITS MAY BE USED BY THE INSTALLATION CONTRACTOR AS DEEMED NECESSARY; HOWEVER, ANY EXISTING CONDUIT WILL BE USED ONLY IF CONDUITS MEET CURRENT STANDARDS AND CODES. JOHNSON CONTROLS MAKES NO STATEMENTS WRITTEN OR VERBAL AS TO THE CONDITION OF EXISTING CONDUITS.

LAST SAVED BY: JBUCKA
LAST PRINTED: 1/19/2023 10:13:08 AM
30" x 42" - Arch E1 Size

Johnson Controls
DISTRICT - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-343-9797
PHONE: 248-427-5050
FAX: 248-426-6655

BATTLE CREEK PUBLIC SCHOOLS

BATTLE CREEK PUBLIC SCHOOLS
DUDLEY ELEMENTARY
DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

Revisions shown with symbol

ISSUE LOG:

MARK	DATE	CAD	CHK	DESCRIPTION
2	01/20/23	AB	SP	650302115 - DUCT DETECTOR ADD
1	05/11/00	DCV	-	000157-01 - ISSUED FOR STATE REVIEW

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321:650302115

SYSTEM: **FIRE ALARM SYSTEM**

SHEET: **COVER SHEET**

FA-001

Johnson Controls REQUIREMENTS

1. Contractor is expected to pull and terminate all conductors and install all devices for a complete and operating system.
2. Where fan shutdown or special auxiliary functions are required, contractor shall verify wiring requirements with the Johnson Controls Project Manager or factory trained technician assigned to the project (in many cases, special wiring will not be shown on the drawings).
3. The contractor shall label all wiring.
4. Smoke detectors are not to be mounted within three (3) feet of air outlets.
5. In cases where a smoke/heat detector is installed in a room or closet.
   The detector should be mounted as close as possible to the center of the room.
6. Wall mounted smoke detectors shall be installed so that the top of the detector is between four (4) inches and twelve (12) inches down from the ceiling.
7. Smoke detectors to be installed on either side of a set of fire doors should be mounted no more than five (5) feet and no less than two (2) feet from the wall section above the door.
8. Visuals should not be obscured by support beams or protrusions on walls.
   Visuals should not be mounted within three (3) feet of wall-mounted lights.
9. Contractor should not install smoke detector heads in the bases or duct housings until final checkout time to ensure that dirt or dust does not contaminate the detectors causing false alarm.
10. Do not power up system until Johnson Controls factory technician is present.
11. A separate ground (isolated from conduit ground) must be pulled to all cabinets.
12. Loads greater than 10 amps (for auxiliary functions) are not allowed in the same conduit as fire alarm.
13. The operable part of the manual stations shall be installed not less than three and a half (3-1/2) feet and not more than four and a half (4-1/2) feet above floor level and not more than five (5) feet from any exit.
14. CONTRACTOR IS REQUIRED TO NOTIFY Johnson Controls AT LEAST TEN (10) BUSINESS DAYS BEFORE FINAL CHECKOUT
15. Contractor to ensure that all wiring is free of shorts, grounds and opens.
16. Underground wiring must maintain one MEG. OHM of resistance to ground
17. When installing shield cable, the following must be observed:
    17.a. Metallic continuity must be maintained throughout the entire length of the cable run.
    17.b. The cable shields must be isolated from ground and terminated only in the associated control panel at the terminal indicated on the control panel drawing. The remote end of the shield (at last device) must be taped and isolated from ground.
18. Duct smoke detectors are tested and rated as approved by UL for operation between 32-degree and 100-degree F. For this reason, duct detectors must not be mounted on the exterior of the building.

SPECIAL INSTRUCTIONS

1. Johnson Controls will provide wiring instructions for installation of Johnson Controls equipment.
2. Johnson Controls will provide assistance to review the operation of the system and the correct method by which the proposed equipment should be wired and connected.
3. Johnson Controls will provide a factory trained technician for testing for the following:
   a. Operation and functions of the control panels
   b. Alarm test of all Johnson Controls peripheral devices (smoke detector, manual station, etc.)
   c. Supervisory test of all initiating, signaling and control circuits
4. Johnson Controls will provide instruction, at final test of the system to the following:
   a. Owner representative
   b. Fire Marshal and Electrical Inspector
   c. Architect and Engineer
5. Upon completion of final test, Johnson Controls will provide the following:
   a. Test report
   b. Certification
   c. Warranty required by contract documents

POTENTIAL PROBLEMS CAN BE AVOIDED BY ADHERING TO THE FOLLOWING:

1. DO NOT initially start up the system except in the presence of a Johnson Controls technician. Johnson Controls assumes no liability for damaged equipment and warranty may be voided if this procedure is not followed.
2. DO NOT install smoke detector heads, unless it is protected by the plastic housing the unit is packaged in or a plastic bag (must be removed prior to testing) until final construction clean up has occurred. This is to prevent damage caused by dust, dirt and debris. Detectors installed prior to clean up may require disassembly, cleaning or replacement which is not covered by warranty.
3. Care must be taken to protect equipment during the installation and warranty period. Failure due to external causes (lightning surges, construction dust, water damage, etc.) will be repaired by Johnson Controls only upon receipt of a valid written purchase Order.
4. Johnson Controls will provide one complete system test, which is coordinated by the installer. To avoid additional charges, installer should schedule this test so that all appropriate parties are present.
5. All wiring shall be free of shorts, opens and grounds.
6. 4100-6072/6073/6074/6075 Fiber Optic Modems Important Installing Information

   All fiber backbone components must at a minimum meet EIA/TIA 568-C.3 for maximum power losses. ST connectors with long-strain relief boots are to be used with fiber optic cable.
   No more than three splices should be used in a given link in addition to the connectors on the modems themselves.

Single-Mode Fiber:	Multi-Mode Fiber:
Maximum total attenuation: 15 dB	Maximum total attenuation: 6 dB
Maximum total distance: 20 miles	Maximum total distance: 5,000 feet
Compatible Fiber: Nominal 9/125 µm	Compatible Fiber: 50/125 µm or 62.5/125 µm graded index

7. 4100-6120/6121/6122/6123 Fiber Optic Modems Important Installing Information

   All fiber backbone components must at a minimum meet EIA/TIA 568-C.3 for maximum power losses. SC (UPC Type) connectors with long-strain relief boots are to be used with fiber optic cable.
   No more than three splices should be used in a given link in addition to the connectors on the modems themselves.

Single-Mode Fiber:	Multi-Mode Fiber:
Maximum total attenuation: 22 dB	Maximum total attenuation: 18 dB
Maximum total distance: 20 miles	Maximum total distance: 5 km (3.10 miles)
Compatible Fiber: Nominal 9/125 µm	Compatible Fiber: 50/125 µm or 62.5/125 µm graded index

8. 4100-6308/6309 ES Net Fiber Optic Media Card Important Installing Information

   All fiber backbone components must at a minimum meet ANSI/TIA/EIA 568-C.3 for maximum power losses. SC (UPC Type) connectors with long strain relief boots with a minimum bend radius of two, are to be used with fiber optic cable. Refer to the specific cable utilized for exact specifications regarding Maximum Individual Fiber Loss.

Single-Mode Fiber:	Multi-Mode Fiber:
Maximum total attenuation: 22 dB @ 1310nm	Maximum total attenuation: 10 dB @ 1300nm
Maximum total distance: 15 km (15.53 miles)	Maximum total distance: 5 km (3.10 miles)
Compatible Fiber: Nominal 9/125 µm	Compatible Fiber: 50/125 µm or 62.5/125 µm

9. 4190-9011/9012 Fiber Optic Audio Repeaters Important Installing Information

   When using the fiber communication path, the maximum distance between nodes is dependent upon the fiber's multimode index.
   ST connectors with long-strain relief boots are to be used with fiber optic cable. The maximum-allowed loss is 10 dB.

   62.5/125 fiber distance is typically 10,000 feet
   50/125 fiber distance is typically 6,500 feet

10. All base line fiber readings should be documented and forwarded to Johnson Controls at start of the project. If existing fiber is used, a proper testing of that fiber should be done prior to installing Johnson Controls equipment and forwarded to Johnson Controls at start of the project. Fiber Optical Cable Shall be installed by a qualified fiber optic technician/installer. When using fiber optic transmission lines, an initial acceptance test of the fiber shall be performed as stated in NFPA 72. NFPA 72 states the fiber optic transmission line shall be tested in accordance with manufacturer's published instructions by the use of an Optical Power Meter or by an Optical Time Domain Reflectometer (OTDR) to measure the relative power loss of the line. Prior to connecting the fiber optic cable to the Fire Alarm panels, Johnson Controls will require OTDR test reports indicating all fiber spans meet the following requirements.

    a. For Fiber Optic Modem installations each fiber link shall be tested by the use of an OTDR using the proper launch and receive cables. All singlemode fibers shall be tested at 1310nm and 1550nm. All multimode fiber shall be tested at 850nm and 1300nm.

    b. The Fiber Infrastructure shall be accepted for use only after it has determined that it meets or exceeds EIA/TIA 568-C.3 performance standards.

    c. Test data should be documented and should include the following:
       - OTDR traces for all fiber links
       - The type of fiber used including the size
       - Where and what type of splices (if any) were used including losses
       - Where and what type of connectors were used including losses
       - What type of cable was used including manufactures' specifications
       - All routing information including pathways, installed spares, alternate routing, mechanical protection used (splice trays, inner duct, etc.), conduit fill ratios, etc.

11. The following summarizes EIA/TIA-568-C.3 standards for maximum allowed loss. For comparison, typical loss values are shown and generally meet or exceed the industry standards. (See Below)

- Maximum and Typical Insertion Loss per Mated Pair of Connectors.
  - o Multimode Maximum (50 & 62.5um): 0.75 dB
  - o Multimode Typical (Epoxy): 0.30 dB
  - o Multimode Typical (Pre-Polished): 0.50 dB
  - o Singlemode Maximum: 0.75 dB
  - o Singlemode Typical (Epoxy): 0.20 dB
  - o Singlemode Typical (Pre-Polished): 0.50 dB
- Maximum and Typical Loss per Fusion or Mechanical Splice (Multimode or Singlemode)
  - o Maximum Loss: 0.30 dB
  - o Typical (Mechanical): 0.15 dB
  - o Typical (Fusion): 0.05 dB
- Maximum and Typical Multimode Fiber Attenuation (50 & 62.5um)
  - o Maximum Loss Per Km: (850 nm): 3.5 dB/Km
  - o Maximum Loss Per Km: (1300 nm): 1.5 dB/Km
  - o Typical Loss Per Km: (850 nm): 3.0 dB/Km
  - o Typical Loss Per Km: (1300 nm): 0.7 dB/Km
- Maximum and Typical Singlemode Fiber Attenuation
  - o Maximum Loss Per Km: (Tight Buffered): 1.0 dB/Km
  - o Maximum Loss Per Km: (Loose Tube): 0.5 dB/Km
  - o Typical Loss Per Km: (1310 nm): 0.35 dB/Km
  - o Typical Loss Per Km: (1550 nm): 0.22 dB/Km
- Typical Optical Return Loss (Back Reflection)
  - o Multimode Reflectance ≥ -20 dB in the negative direction
  - o Singlemode Reflectance ≥ -26 dB in the negative direction
  - o Flat Finish-Typical Reflectance -20dB to -29dB High return losses
  - o PC Finish-Typical Reflectance -30dB to -39dB Moderate return losses
  - o SPC Finish-Typical Reflectance -40dB to -49dB Intermediate return losses
  - o UPC Finish-Typical Reflectance -50dB to -59dB Superior return losses
  - o APC Finish-Typical Reflectance -60dB and lower Best low loss option

Johnson Controls
DISTRICT - 291
24700 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-543-9797
PHONE: 248-427-5050
FAX: 248-426-8855

BATTLE CREEK PUBLIC SCHOOLS

BATTLE CREEK PUBLIC SCHOOLS
DUDLEY ELEMENTARY

DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

Revisions shown with ⚠ symbol

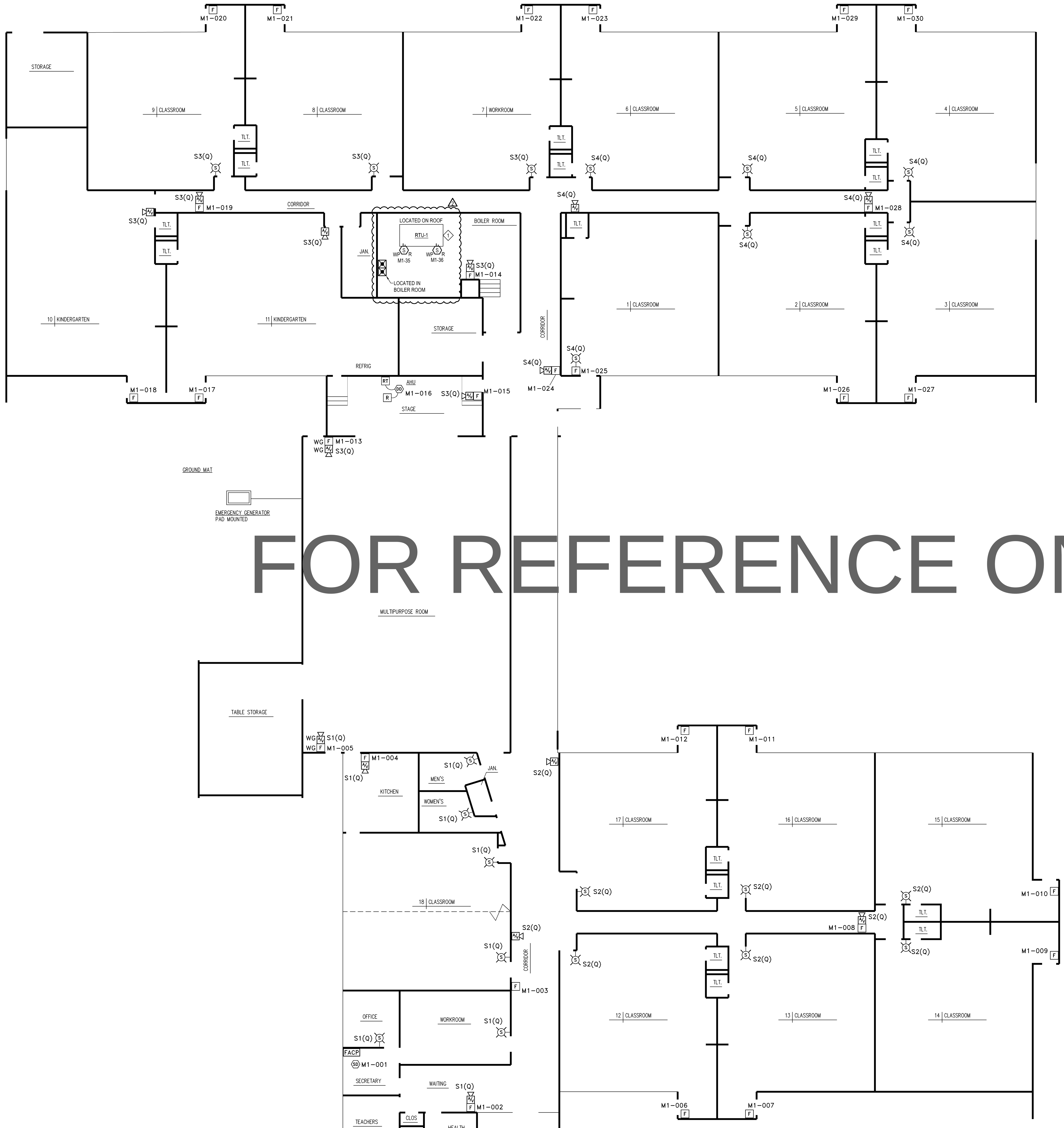
ISSUE LOG: MARK	DATE	CAD	CHK	DESCRIPTION
2	1/19/2023	AB	SP	650302115 - DUCT DETECTOR ADD

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321-650302115

SYSTEM:
FIRE ALARM SYSTEM

SHEET:
JOHNSON CONTROLS REQUIREMENTS

FA-002



FLOOR PLAN
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. ALL CEILINGS ARE ASSUMED TO BE 10' A.F.F., SMOOTH CONSTRUCTION UNLESS NOTED OTHERWISE.
2. THE DEVICE ADDRESSES INDICATED ON THESE DRAWINGS ARE AN ALPHANUMERIC DESCRIPTION OF WHICH CIRCUIT THE DEVICE IS LOCATED ON. DEVICES MAY BE ASSIGNED A DIFFERENT NUMBER WITHIN THE PANEL PROGRAM. CONSULT WITH A JOHNSON CONTROLS TECHNICIAN BEFORE APPLYING A PHYSICAL LABEL TO ANY DEVICES.

KEYED NOTES:

1. RTU-1 IS LOCATED ON THE ROOF. INSTALL THE NEW DUCT DETECTORS IN THE WEATHERPROOF ENCLOSURES ON RTU-1 ON ROOF. REFER TO SHEET FA-702 FOR DETAILS.

INSTALL NEW REMOTE TEST SWITCHES IN BOILER ROOM IN ACCESSIBLE AREA. (2)

FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	BRAND	MODEL	BACKBOX	WIRE TYPE
PANELS					
FACP	4010 FIRE ALARM CONTROL PANEL, 120 VAC, BEIGE	SIMPLEX	4010-9101	SIMPLEX CABINET	N/A
INITIATING DEVICES					
SD	ADDRESSABLE PHOTOELECTRIC SMOKE SENSOR W/ STANDARD BASE	SIMPLEX	4098-9714 HEAD 4098-9792 BASE	4" OCT, 1-1/2" D	M
F	ADDRESSABLE MANUAL PULL STATION	SIMPLEX	4099-9003	4" SQ, 2-1/8" D W/ 3/4" SINGLE GANG COVER EXTENSION	M
WG =	WIRE GUARD, RED		2099-9800		
DD	SSD SENSOR DUCT HOUSING W/ RELAY OUTPUT	SIMPLEX	4098-9753	MOUNTED TO DUCTWORK	M P
	PHOTOELECTRIC SMOKE SENSOR	SIMPLEX	4098-9714		
	SAMPLING TUBE, 49"	SIMPLEX	2098-9797		
R S	ADDRESSABLE DUCT SMOKE DETECTOR W/ RELAY OUTPUT	SIMPLEX	4098-9756	MOUNTS TO DUCTWORK	M P
	SAMPLING TUBE, 73"	SIMPLEX	4098-9857		
WP =	WEATHERPROOF ENCLOSURE	SIMPLEX	4098-9845		
MODULES AND RELAYS					
R	TRACK MOUNTED SINGLE RELAY DPDT W/O ENCLOSURE, APOLLO AMERICA INC MR-201/T	SIMPLEX	2088-9009	TRACK MOUNT, WITHOUT ENCLOSURE	R
P	ENCAPSULATED RELAY	SIMPLEX	4098-9843	SINGLE GANG 2-1/8" D W/ COVER	R
NOTIFICATION APPLIANCES					
A/V	CONVENTIONAL 75-CANDELA HORN/STROBE, WALL MOUNT, RED, CLEAR LENS, FIRE	SIMPLEX	4903-9418	4" SQ. 1-1/2" D	V
WG =	WIRE GUARD, WALL, RED	SIMPLEX	4905-9961		
S	CONVENTIONAL 75-CANDELA STROBE, WALL MOUNT, RED, CLEAR LENS, FIRE	SIMPLEX	4904-9332	SINGLE GANG 1-1/2" D	V
MISCELLANEOUS DEVICES					
RT	REMOTE TEST STATION	SIMPLEX	2098-9806	SINGLE GANG 2"D	K
#K	END-OF-LINE RESISTOR 3.3kΩ, 1W (EOL)	SIMPLEX	4081-9002		
	END-OF-LINE RESISTOR 4.7kΩ, 1/2W (EOL)		4081-9003		
	END-OF-LINE RESISTOR 6.8kΩ, 1/2W (EOL)		4081-9004		
	END-OF-LINE RESISTOR 10kΩ, 1/2W (EOL)		4081-9008		

FIRE ALARM WIRE LEGEND

	CIRCUIT DESCRIPTION	CONSTRUCTION	GAUGE	CIRCUIT PROPERTIES	FPLR	FPLP	THHN	TFFN	OUTDOOR **	C.I.
					ACCEPTABLE CABLE TYPES					
K	REMOTE TEST SWITCH/LED	(2) 2 COND. SOLID	14 AWG		X	X				
M	MAPNET/IDNET	STP SOLID	18 AWG	0.60μF MAX TOTAL LINE CAPACITANCE	X	X				
P	POWER	2 COND. SOLID	14 AWG		X	X	X	X		
R	RELAY	2 COND. SOLID	14 AWG		X	X	X	X		
V	VISUAL	2 COND. SOLID	14 AWG		X	X				

CONDUIT SIZE	MAX CONDUCTOR AREA	CONDUIT SIZE	MAX CONDUCTOR AREA
1/2"	0.122 SQ. INCH*	1-1/4"	0.598 SQ INCH*
3/4"	0.213 SQ INCH*	1-1/2"	0.814 SQ INCH*
1"	0.346 SQ INCH*	2"	1.342 SQ INCH*

* 40% CONDUIT FILL PER N.E.C.

STP = SHIELDED TWISTED PAIR

ITEMS SUCH AS CAPACITANCE BETWEEN CONDUCTORS AND WIRE GAUGE CAN BE CRUCIAL TO THE CIRCUIT DESIGN OF THIS SYSTEM INSTALLATION. THE INSTALLING CONTRACTOR IS RESPONSIBLE FOR SELECTING AND INSTALLING CABLE MANUFACTURER AND MODEL THAT MEETS OR EXCEEDS THE ABOVE REQUIREMENTS. RECOMMENDED CABLE MANUFACTURERS AND MODEL NUMBERS ARE AVAILABLE UPON REQUEST.

SCALE: 1/8" = 1'-0" — 0, 4', 8', 16' IN FEET

Johnson Controls
DISTRICT - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-343-9797
PHONE: 248-427-5050
FAX: 248-426-6655

BATTLE CREEK PUBLIC SCHOOLS
DUDLEY ELEMENTARY

DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

Revisions shown with # symbol

ISSUE LOG:

MARK	DATE	CAD	CHK	DESCRIPTION
2	01/20/23	AB	SP	650302115 - DUCT DETECTOR ADD
1	05/11/00	DCV	-	000157-01 - ISSUED FOR STATE REVIEW

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321:650302115

SYSTEM: **FIRE ALARM SYSTEM**

SHEET: **FLOOR PLAN**

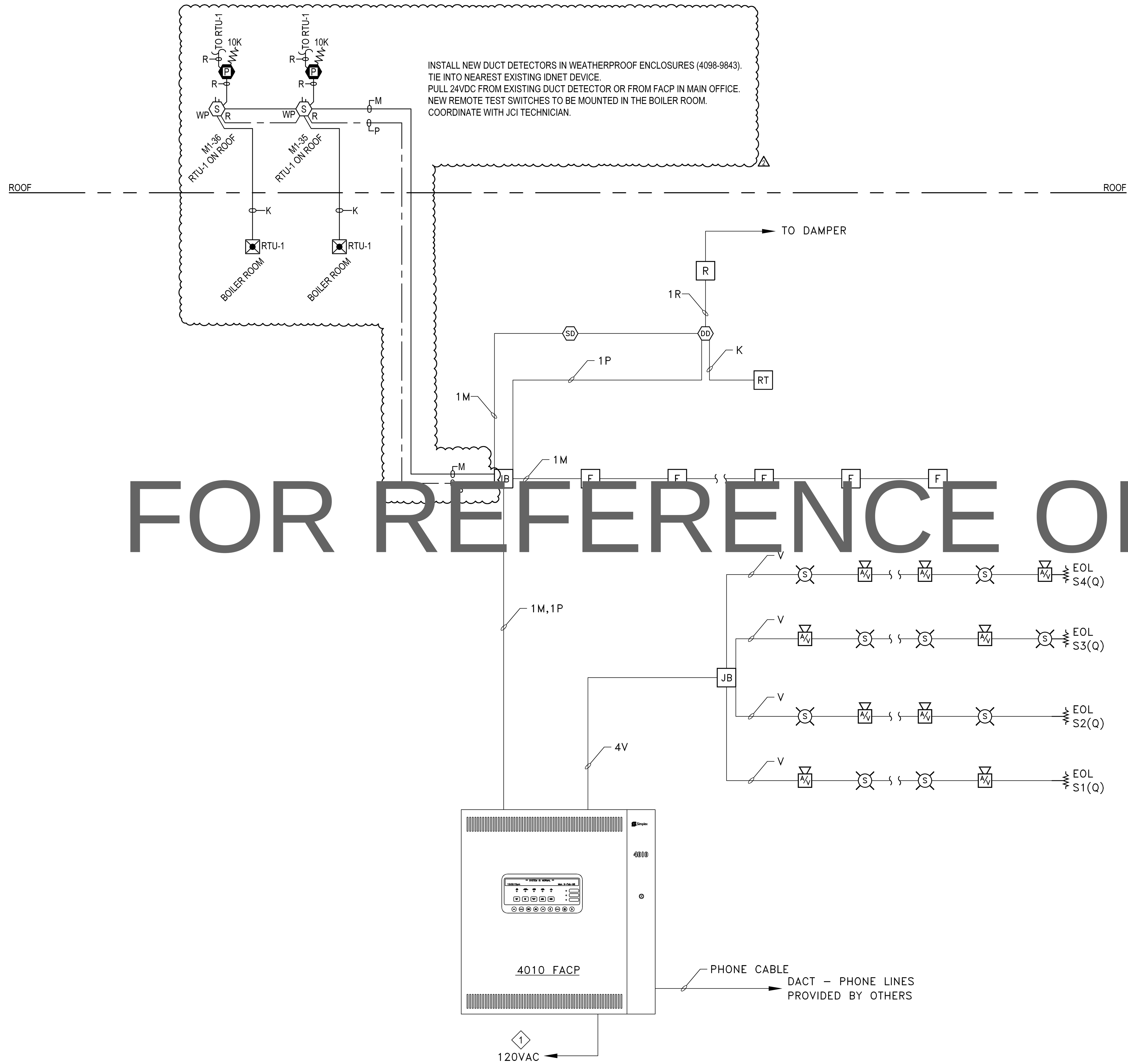
FA-101

RISER NOTES:

1. RISER IS A DIAGRAMMATICAL REPRESENTATION OF THE SYSTEM ARCHITECTURE IN BUILDING CROSS SECTION. IT IS NOT INTENDED TO REPRESENT ACTUAL WIRE RUNS, PANEL CONFIGURATIONS OR PENETRATIONS. REFER TO FLOOR PLANS AND PANEL DETAILS FOR CIRCUIT ROUTING AND CONFIGURATION INFORMATION.
2. ALL WIRING SHALL COMPLY WITH APPLICABLE ELECTRICAL CODES. REFER TO 'APPLICABLE CODES & STANDARDS' ON SHEET FA-001 FOR SPECIFIC CODE REFERENCES.
3. DEVICES ARE TYPICAL. SEE FLOOR PLAN FOR QUANTITY & LOCATIONS.

KEYED NOTES:

1 — 120VAC PRIMARY POWER SOURCE SHALL BE A MECHANICALLY PROTECTED BRANCH CIRCUIT. THE CIRCUIT DISCONNECTING MEANS SHALL HAVE A RED MARKING, AND BE IDENTIFIED AS "FIRE ALARM CIRCUIT"



FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	BRAND	MODEL	BACKBOX	WIRE TYPE
PANELS					
FACP	4010 FIRE ALARM CONTROL PANEL, 120 VAC, BEIGE	SIMPLEX	4010-9101	SIMPLEX CABINET	N/A
INITIATING DEVICES					
SD	ADDRESSABLE PHOTOELECTRIC SMOKE SENSOR W/ STANDARD BASE	SIMPLEX	4098-9714 HEAD 4098-9792 BASE	4" OCT, 1-1/2" D	M
F	ADDRESSABLE MANUAL PULL STATION	SIMPLEX	4099-9003	4" SQ, 2-1/8" D W/ 3/4" SINGLE GANG COVER EXTENSION	M
WG =	WIRE GUARD, RED		2099-9800		
DD	SSD SENSOR DUCT HOUSING W/ RELAY OUTPUT	SIMPLEX	4098-9753	MOUNTED TO DUCTWORK	M P
	PHOTOELECTRIC SMOKE SENSOR	SIMPLEX	4098-9714		
	SAMPLING TUBE, 49"	SIMPLEX	2098-9797		
R S	ADDRESSABLE DUCT SMOKE DETECTOR W/ RELAY OUTPUT	SIMPLEX	4098-9756	MOUNTS TO DUCTWORK	M P
	SAMPLING TUBE, 73"	SIMPLEX	4098-9857		
WP =	WEATHERPROOF ENCLOSURE	SIMPLEX	4098-9845		
MODULES AND RELAYS					
R	TRACK MOUNTED SINGLE RELAY DPDT W/O ENCLOSURE, APOLLO AMERICA INC MR-201/T	SIMPLEX	2088-9009	TRACK MOUNT, WITHOUT ENCLOSURE	R
P	ENCAPSULATED RELAY	SIMPLEX	4098-9843	SINGLE GANG 2-1/8" D W/ COVER	R
NOTIFICATION APPLIANCES					
A/V	CONVENTIONAL 75-CANDELA HORN/STROBE, WALL MOUNT, RED, CLEAR LENS, FIRE	SIMPLEX	4903-9418	4" SQ. 1-1/2" D	V
WG =	WIRE GUARD, WALL, RED	SIMPLEX	4905-9961		
S	CONVENTIONAL 75-CANDELA STROBE, WALL MOUNT, RED, CLEAR LENS, FIRE	SIMPLEX	4904-9332	SINGLE GANG 1-1/2" D	V
MISCELLANEOUS DEVICES					
RT	REMOTE TEST STATION	SIMPLEX	2098-9806	SINGLE GANG 2"D	K
#K	END-OF-LINE RESISTOR 3.3kΩ, 1W (EOL)	SIMPLEX	4081-9002		
	END-OF-LINE RESISTOR 4.7kΩ, 1/2W (EOL)		4081-9003		
	END-OF-LINE RESISTOR 6.8kΩ, 1/2W (EOL)		4081-9004		
	END-OF-LINE RESISTOR 10kΩ, 1/2W (EOL)		4081-9008		

FIRE ALARM WIRE LEGEND

	CIRCUIT DESCRIPTION	CONSTRUCTION	GAUGE	CIRCUIT PROPERTIES	FPLR	FPLP	THHN	TFFN	OUTDOOR **	C.I.
					ACCEPTABLE CABLE TYPES					
K	REMOTE TEST SWITCH/LED	(2) 2 COND. SOLID	14 AWG		X	X				
M	MAPNET/IDNET	STP SOLID	18 AWG	0.60µF MAX TOTAL LINE CAPACITANCE	X	X				
P	POWER	2 COND. SOLID	14 AWG		X	X	X	X		
R	RELAY	2 COND. SOLID	14 AWG		X	X	X	X		
V	VISUAL	2 COND. SOLID	14 AWG		X	X				

CONDUIT SIZE	MAX CONDUCTOR AREA	CONDUIT SIZE	MAX CONDUCTOR AREA
1/2"	0.122 SQ. INCH*	1-1/4"	0.598 SQ INCH*
3/4"	0.213 SQ INCH*	1-1/2"	0.814 SQ INCH*
1"	0.346 SQ INCH*	2"	1.342 SQ INCH*

* 40% CONDUIT FILL PER N.E.C.

STP = SHIELDED TWISTED PAIR

ITEMS SUCH AS CAPACITANCE BETWEEN CONDUCTORS AND WIRE GAUGE CAN BE CRUCIAL TO THE CIRCUIT DESIGN OF THIS SYSTEM INSTALLATION. THE INSTALLING CONTRACTOR IS RESPONSIBLE FOR SELECTING AND INSTALLING CABLE MANUFACTURER AND MODEL THAT MEETS OR EXCEEDS THE ABOVE REQUIREMENTS. RECOMMENDED CABLE MANUFACTURERS AND MODEL NUMBERS ARE AVAILABLE UPON REQUEST.

RISER DIAGRAM
SCALE:N.T.S.

Johnson Controls
DISTRICT - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-343-9797
PHONE: 248-427-5050
FAX: 248-426-6655

BATTLE CREEK PUBLIC SCHOOLS
DUDLEY ELEMENTARY

DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

Revisions shown with symbol

ISSUE LOG:

MARK	DATE	CAD	CHK	DESCRIPTION
2	01/20/23	AB	SP	650302115 - DUCT DETECTOR ADD
1	05/11/00	DCV	-	000157-01 - ISSUED FOR STATE REVIEW

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321:650302115

SYSTEM: FIRE ALARM SYSTEM

SHEET: RISER DIAGRAM

FA-201

FILE PATH: C:\$MY PROJECTS\In Progress\650302115 - BATTLE CREEK DUDLEY HVAC\FA-201.dwg
LAST SAVED BY: JBUCKA
LAST PRINTED: 1/19/2023 10:13:16 AM
30" x 42" - Arch E1 Size

4010 / MAIN OFFICE / 4010 FACP

Module	Qty	Description	Standby Current	Total Standby	Alarm Current	Total Alarm
Panel Equipment						
4010-9101	1	**FACP 250PT 4NAC 4A 120V BEIGE** *	0.1950	0.1950	0.2950	0.2950
4010-9810	1	DACT (COMMON EVENT REPORTING)	0.0400	0.0400	0.0400	0.0400
4010-9813	1	EXPANSION POWER SUPPLY 120V	0.0000	0.0000	0.0000	0.0000
		Panel Totals		0.2350		0.3350
IDNet Addressable Devices (SLC)						
4098-9714	2	TRUEALARM PHOTO SMOKE SENSOR	Constant current draw of .8mA standby and 1mA alarm per address used. Devices requiring additional current are accounted for in the section labeled "Miscellaneous Peripheral Devices Requiring Additional System Power".			
4098-9753	1	TRUEALARM DUCT SMOKE SENSOR HOUSING W/ RELAY *				
4098-9756	2	TRUEALARM DUCT SMOKE SENSOR W/ RELAY OUTPUT *				
4098-9792	1	TRUEALARM SENSOR BASE *				
4099-9003	28	ADDRESSABLE DOUBLE ACTION PULL STATION *				
Miscellaneous Peripheral Devices That Require (Additional) System Power						
4098-9843	2	ENCAPSULATED RELAY PAM-SD	0.0000	0.0000	0.0150	0.0300
4098-9756	2	TRUEALARM DUCT SMOKE SENSOR W/ RELAY OUTPUT	0.0030	0.0060	0.0150	0.0300
2098-9806	3	REMOTE TEST STATION W/ LED AND KEY SWITCH	0.0000	0.0000	0.0000	0.0000
Notification Appliances		Setting				
4903-9418	15	TRUEALERT 75CD AUDIBLE/VISIBLE RED 75	0.0000	0.0000	0.2140	3.2100
4904-9332	21	TRUEALERT 75CD VISIBLE ONLY RED SYNC 75	0.0000	0.0000	0.1990	4.1790
		Peripheral Totals		0.0084		7.4810
		Address Totals 32 Addresses		0.0256		0.0320
		System Totals*: Standby		0.2690	Alarm	7.8480

* Device Address current draw included below (See Additional Current Draws):

Battery Set #1 (Cabinet/Charger #1)			Standby Current	Standby Total	Alarm Current	Alarm Total
Select ALL Power Supplies on this battery set:						
4010				0.2434		7.8160
			Sub Total	0.2434		7.8160
Additional Current Draws:						
RUI Connected Peripheral Devices		0	x 0.0035	= 0.0000	x 0.0035	= 0.0000
MAPNET/IDNet Device Address Communication Current		32	x 0.000800	= 0.0256	x 0.001000	= 0.0320
			Sub Total	0.2690		7.8480
Spare addressable point capacity	0%	0	x 0.0008	= 0.0000	x 0.001	= 0.0000
			Total	0.2690		7.8480
Standby Time =	24	Hrs	x 0.2690	= 6.4560	Standby Ah	
Alarm Time =	5	Min	0.08333 x 7.848	= 0.6540	Alarm Ah	
				7.1100		
Additional Spare Battery Capacity =	0%		+	0.0000		
				7.1100		
Battery Discharge Factor =	20%		+	1.4220		
Minimum [illegible] ired	2081-[illegible]			[illegible]		
Battery Supp[illegible]	2081-[illegible]37 25AH (2x)					

* System Totals represent total sy[illegible]em current requir[illegible]ents. Those curre[illegible] may [illegible] distributed be[illegible]een multiple bat[illegible] sets or pow[illegible] upplie[illegible] s shown above.

FOR REFERENCE ONLY

POWER SUPPLY SUMMARY Module	Qty	Description	Powered By Ext. Source Qty.	Standby Current	Alarm Current
ADDRESSABLE DEVICES REQUIRING 24VDC AUX. POWER					
4098-9756	2	TRUEALARM DUCT SMOKE SENSOR W/ RELAY OUTPUT	0	0.0030	0.0150
MISCELLANEOUS 24VDC PERIPHERALS					
4098-9843	2	ENCAPSULATED RELAY PAM-SD	0	0.0000	0.0150
2098-9806	3	REMOTE TEST STATION W/ LED AND KEY SWITCH	0	0.0000	0.0000
4098-9753	1	TRUEALARM DUCT SMOKE SENSOR HOUSING W/ RELAY	0	0.0024	0.0320
					24vdc Aux Totals
PANEL COMPONENTS POWERED BY POWER SUPPLY					
4010-9101	1	**FACP 250PT 4NAC 4A 120V BEIGE**		0.1950	0.2950
4010-9810	1	DACT (COMMON EVENT REPORTING)		0.0400	0.0400
4010-9813	1	EXPANSION POWER SUPPLY 120V		0.0000	0.0000
					Components
					NAC Currents from Voltage Drops
					IDNac Current Boost for 29vdc Regulated Output *
					MAPNET/IDNet Device Addresses used

4010 SUMMARY Qty	Total Standby	Total Alarm
2	0.0060	0.0300
2	0.0000	0.0300
3	0.0000	0.0000
1	0.0024	0.0320
	0.0084	0.0920
1	0.1950	0.2950
1	0.0400	0.0400
1	0.0000	0.0000
	0.2350	0.3350
	0.0000	7.3890
	0.0000	0.0000
32	0.0256	0.0320
Total	0.2434	7.8160

4010	Configuration
Capacity:	8.000A
Ckt. Capacity:	2.000A
Aux. Capacity:	0.500A

IDNET CHANNEL M1

ADDRESSES IN USE: 32 (12.8%) | SPARE ADDRESSES: 218 (87.2%)

Address	Device Type	Point Type	Location Description		1	2	3	4	5	6	7	8	
M1-1	PHOTO	SMOKE	MAIN OFFICE	M1-1	X								ON
M1-2	ADRPUL	PULL	WAITING ROOM	M1-2		X							ON
M1-3	ADRPUL	PULL	CORRIDOR BY CLASSROOM 18	M1-3	X	X							ON
M1-4	ADRPUL	PULL	KITCHEN	M1-4			X						ON
M1-5	ADRPUL	PULL	MULTIPURPOSE ROOM SOUTH	M1-5	X		X						ON
M1-6	ADRPUL	PULL	CLASSROOM 12	M1-6		X	X						ON
M1-7	ADRPUL	PULL	CLASSROOM 13	M1-7	X	X	X						ON
M1-8	ADRPUL	PULL	CORRIDOR BY CLASSROOM 14	M1-8				X					ON
M1-9	ADRPUL	PULL	CLASSROOM 14	M1-9	X			X					ON
M1-10	ADRPUL	PULL	CLASSROOM 15	M1-10		X		X					ON
M1-11	ADRPUL	PULL	CLASSROOM 16	M1-11	X	X		X					ON
M1-12	ADRPUL	PULL	CLASSROOM 17	M1-12			X	X					ON
M1-13	ADRPUL	PULL	MULTIPURPOSE ROOM NORTH	M1-13	X		X	X					ON
M1-14	ADRPUL	PULL	BOILER ROOM	M1-14		X	X	X					ON
M1-15	ADRPUL	PULL	STAGE	M1-15	X	X	X	X					ON
M1-16	RPHOTO	LSDUCT	STAGE	M1-16					X				ON
M1-17	ADRPUL	PULL	KINDERGARTEN 11	M1-17	X				X				ON
M1-18	ADRPUL	PULL	KINDERGARTEN 10	M1-18		X			X				ON
M1-19	ADRPUL	PULL	CORRIDOR BY CLASSROOM 9	M1-19	X	X			X				ON
M1-20	ADRPUL	PULL	CLASSROOM 9	M1-20			X		X				ON
M1-21	ADRPUL	PULL	CLASSROOM 8	M1-21	X		X		X				ON
M1-22	ADRPUL	PULL	CLASSROOM 7	M1-22		X	X		X				ON
M1-23	ADRPUL	PULL	CLASSROOM 6	M1-23	X	X	X		X				ON
M1-24	ADRPUL	PULL	CORRIDOR BY CLASSROOM 1	M1-24				X	X				ON
M1-25	ADRPUL	PULL	CLASSROOM 1	M1-25	X			X	X				ON
M1-26	ADRPUL	PULL	CLASSROOM 2	M1-26		X		X	X				ON
M1-27	ADRPUL	PULL	CLASSROOM 3	M1-27	X	X		X	X				ON
M1-28	ADRPUL	PULL	CORRIDOR BY CLASSROOM 3	M1-28			X	X	X				ON
M1-29	ADRPUL	PULL	CLASSROOM 5	M1-29	X		X	X	X				ON
M1-30	ADRPUL	PULL	CLASSROOM 4	M1-30		X	X	X	X				ON
M1-31					X	X	X	X	X				ON
M1-32										X			ON
M1-33					X					X			ON
M1-34						X				X			ON
M1-35	RPHOTO	LSDUCT	RTU-1 ON ROOF	M1-35	X	X				X			ON
M1-36	RPHOTO	LSDUCT	RTU-1 ON ROOF	M1-36			X			X			ON
M1-37					X		X			X			ON
THRU													ON
M1-250						X		X	X	X	X	X	ON

NOTE: THE LABELS SHOWN ABOVE WILL BE USED FOR PROGRAMMING PURPOSES.
THE LABELS ARE BASED UPON INFORMATION SHOWN ON THE ARCHITECTURAL DRAWINGS.
ANY CHANGES TO THESE LABELS MUST BE NOTED ON THE SUBMITTAL REVIEW, PRIOR TO PROGRAMMING.
POINTS SHOWN IN ITALIC TEXT REFER TO EXISTING DEVICES.

4010 / MAIN OFFICE / 4010 FACP VOLTAGE DROPS

WIRE RESISTANCE BASED ON TABLE 8 FROM NATIONAL ELECTRICAL CODE (UNCOATED SOLID COPPER WIRE) @ 75 Celsius

											PID	4903-9418	4904-9332			
											Setting	75cd	75cd			
											Device Type	A/V	V/O			
											Supv. Current	0.0000	0.0000			
											Alarm Current	0.2140	0.1990			
NOTIFICATION CIRCUIT DESCRIPTION	Power Supply	Panel Circuit	Dist. (D) Feet	Wire Gauge	Wire Res. / Ft. (R)	Total Alarm (A)	V. Drop (A*2D*R)	Volt @ End	% Volt Drop	Min Device Voltage	Max Distance			Circuit Capacity (Amps)	Minimum Voltage @ NAC Output Terminals	Spare Circuit / Branch Capacity
S1(Q)	4010	SIG1	300	14ga	0.0031	1.836	3.382	16.118	17.34%	16vdc	310 Ft.	3	6	2.A	19.5	3.2%
S2(Q)	4010	SIG2	300	14ga	0.0031	1.836	3.382	16.118	17.34%	16vdc	310 Ft.	3	6	2.A	19.5	3.2%
S3(Q)	4010	SIG3	300	14ga	0.0031	1.881	3.465	16.035	17.77%	16vdc	303 Ft.	6	3	2.A	19.5	1.0%
S4(Q)	4010	SIG4	300	14ga	0.0031	1.836	3.382	16.118	17.34%	16vdc	310 Ft.	3	6	2.A	19.5	3.2%

NOTE:
LUMP SUM METHOD WAS USED TO CALCULATE ALLOWABLE VOLTAGE DROP. THIS METHOD ALLOWS FOR A SMALL MARGIN OF SAFETY, TAKING INTO CONSIDERATION THAT THE ACTUAL INSTALLED CIRCUIT ROUTING MAY DIFFER FROM WHAT IS SHOWN ON THE SHOP DRAWINGS. IF THE ACTUAL CIRCUIT LENGTH IS GOING TO EXCEED THE MAXIMUM ALLOWABLE CIRCUIT LENGTH, CONTACT YOUR LOCAL JOHNSON CONTROLS DISTRICT OFFICE.

BILL OF MATERIAL

DRAWING SYMBOL	TOTAL QUANTITY	ADDED THIS REV	PART NUMBER	DESCRIPTION	CUT SHEET
FACP	1		4010-9101	FACP 250PT 4NAC 4A 120V BEIGE	S4010-0001
	1		4010-9810	DACT (COMMON EVENT REPORTING)	S4010-0001
	1		4010-9813	EXPANSION POWER SUPPLY 120V	S4010-0001
	2		2081-9287	25 AH BATTERY	S2081-0006
F	28		4099-9003	PULL STATION IDNET PUSH	S4099-0001
WG =	2		2099-9800	RED WIRE GUARD	S2099-0004
SD	1		4098-9714	SSD PHOTO SENSOR	S4098-0019
	1		4098-9792	SSD SENSOR BASE	S4098-0019
DD	1		4098-9753	SSD SENSOR DUCT HOUSING W/RELAY	N/A
	1		4098-9714	SSD PHOTO SENSOR	S4098-0019
	1		2098-9797	SAMPLING TUBE 49"	S4098-0030
R S	2	2	4098-9756	DUCT SENSOR HOUSING, 4-WIRE	S4098-0030
	2	2	4098-9857	SAMPLING TUBE 73"	N/A
WP =	2	2	4098-9845	DUCT WEATHERPROOF ENCLOSURE	N/A
P	2	2	4098-9843	ENCAPSULATED RELAY PAM-SD	S2088-0010
R	1		2088-9009	MR201 RELAY, DPDT W/LED	S2088-0010
RT	3	2	2098-9806	REMOTE TEST STA RED LED KEY SW	S4098-0030
A/V	15		4903-9418	A/V 75CD RED SYNC NON-ADDRESSA	S4903-0010
WG =	2		4905-9961	WIRE GUARD, RED, V/O & A/V	S4905-0008
S	21		4904-9332	V/O 75CD RED SYNC NON-ADDRESSA	S4904-0003
10K	6	2	4081-9008	EOL, 10K 1/2W	N/A

Johnson Controls
DISTRICT - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-343-9797
PHONE: 248-427-5050
FAX: 248-426-6655

BATTLE CREEK PUBLIC SCHOOLS

BATTLE CREEK PUBLIC SCHOOLS DUDLEY ELEMENTARY

DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

ISSUE LOG: Revisions shown with △ symbol

MARK	DATE	CAD	CHK	DESCRIPTION
2	01/20/23	AB	SP	650302115 - DUCT DETECTOR ADD
1	05/11/00	DCV	-	000157-01 - ISSUED FOR STATE REVIEW

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321:650302115

SYSTEM: FIRE ALARM SYSTEM

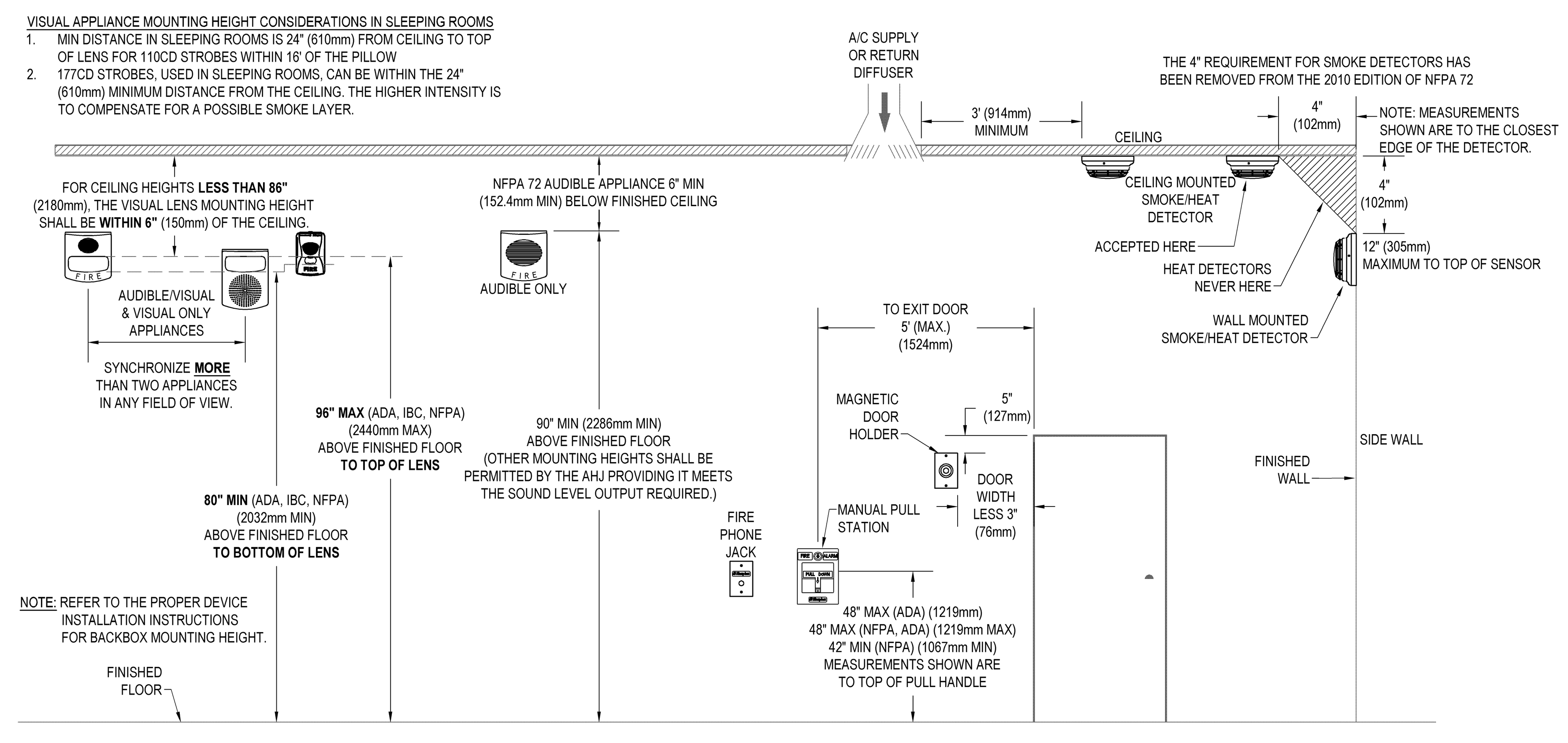
SHEET: PANEL INFORMATION

FA-601

FILE PATH: C:\$MY PROJECTS\In Progress\650302115 - BATTLE CREEK DUDLEY HVAC\FA-601.dwg
LAST SAVED BY: JBUCKA
LAST PRINTED: 1/19/2023 10:13:20 AM
30" x 42" - Arch E1 Size

DEVICE MOUNTING HEIGHT REFERENCE

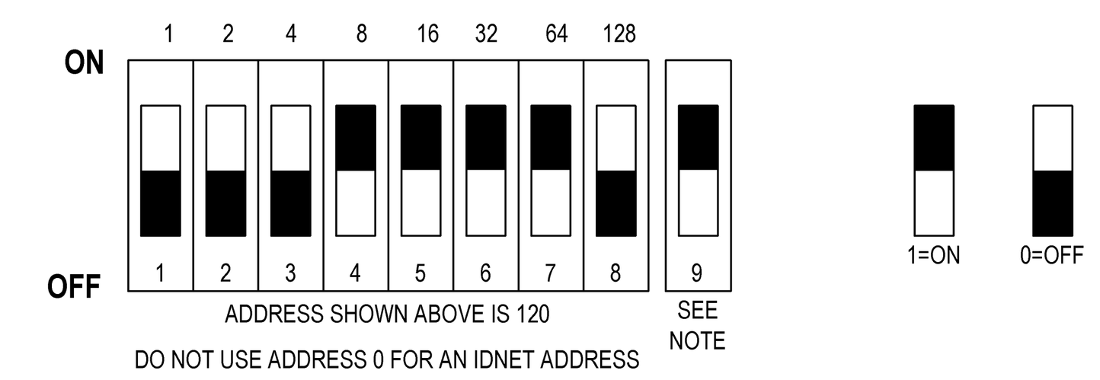
PER NFPA 72



VISUAL APPLIANCE MOUNTING HEIGHT CONSIDERATIONS IN SLEEPING ROOMS
1. MIN DISTANCE IN SLEEPING ROOMS IS 24" (610mm) FROM CEILING TO TOP OF LENS FOR 110CD STROBES WITHIN 16' OF THE PILLOW
2. 177CD STROBES, USED IN SLEEPING ROOMS, CAN BE WITHIN THE 24" (610mm) MINIMUM DISTANCE FROM THE CEILING. THE HIGHER INTENSITY IS TO COMPENSATE FOR A POSSIBLE SMOKE LAYER.
A/C SUPPLY OR RETURN DIFFUSER
3' (914mm) MINIMUM
CEILING
THE 4" REQUIREMENT FOR SMOKE DETECTORS HAS BEEN REMOVED FROM THE 2010 EDITION OF NFPA 72
4" (102mm)
NOTE: MEASUREMENTS SHOWN ARE TO THE CLOSEST EDGE OF THE DETECTOR.
FOR CEILING HEIGHTS LESS THAN 86" (2180mm), THE VISUAL LENS MOUNTING HEIGHT SHALL BE WITHIN 6" (150mm) OF THE CEILING.
NFPA 72 AUDIBLE APPLIANCE 6" MIN (152.4mm MIN) BELOW FINISHED CEILING
CEILING MOUNTED SMOKE/HEAT DETECTOR
ACCEPTED HERE
HEAT DETECTORS NEVER HERE
12" (305mm) MAXIMUM TO TOP OF SENSOR
AUDIBLE/VISUAL & VISUAL ONLY APPLIANCES
AUDIBLE ONLY
SYNCHRONIZE MORE THAN TWO APPLIANCES IN ANY FIELD OF VIEW.
TO EXIT DOOR 5' (MAX.) (1524mm)
WALL MOUNTED SMOKE/HEAT DETECTOR
MAGNETIC DOOR HOLDER
5" (127mm)
96" MAX (ADA, IBC, NFPA) (2440mm MAX) ABOVE FINISHED FLOOR TO TOP OF LENS
90" MIN (2286mm MIN) ABOVE FINISHED FLOOR (OTHER MOUNTING HEIGHTS SHALL BE PERMITTED BY THE AHJ PROVIDING IT MEETS THE SOUND LEVEL OUTPUT REQUIRED.)
SIDE WALL
FINISHED WALL
DOOR WIDTH LESS 3" (76mm)
80" MIN (ADA, IBC, NFPA) (2032mm MIN) ABOVE FINISHED FLOOR TO BOTTOM OF LENS
MANUAL PULL STATION
FIRE PHONE JACK
NOTE: REFER TO THE PROPER DEVICE INSTALLATION INSTRUCTIONS FOR BACKBOX MOUNTING HEIGHT.
48" MAX (ADA) (1219mm)
48" MAX (NFPA, ADA) (1219mm MAX)
42" MIN (NFPA) (1067mm MIN)
MEASUREMENTS SHOWN ARE TO TOP OF PULL HANDLE
FINISHED FLOOR

DIP SWITCH SETTINGS - INITIATING

SIMPLEX IDNet



DIP SWITCHES 5 THRU 8 (columns); DIP SWITCHES 1 THRU 4 (rows)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

NOTE:
THE 4098-9771, -9794, -9795, -9798 SOUNDER BASES HAVE A 9-POSITION DIP SWITCH. THE FIRST EIGHT DIP SWITCHES SET THE SOUNDER BASE ADDRESS. DIP SWITCH POSITION 9 IS SET TO OFF OR ON DEPENDING UPON THE SOUNDER BASE POWER SOURCE. WHEN THE SOUNDER BASE IS CONNECTED TO A 24 VDC POWER SOURCE, DIP SWITCH POSITION 9 IS SET TO "OFF" AND THE 24 VDC POWER IS SUPERVISED BY THE SOUNDER BASE. WHEN THE SOUNDER BASE IS POWERED BY THE PANEL'S NOTIFICATION APPLIANCE CIRCUIT (NAC), DIP SWITCH POSITION 9 IS SET TO "ON" AND THE POWER IS SUPERVISED BY THE NAC AND NOT THE SOUNDER BASE. THE 4098-9770 AND -9797 BASES HAVE THE SAME LAYOUT, BUT DOESN'T OFFER SOUNDER FUNCTIONALITY. THEY USE AN 8-WAY DIP SWITCH ONLY.

END OF LINE RESISTOR CODES

NOTE: REFER TO PANEL/MODULE AND DEVICE INSTALLATION INSTRUCTIONS FOR PROPER TERMINATIONS.

MODEL	REF. NUMBER	Ω	BAND NUMBER					WATTS	CIRCUIT TYPE	FIRE ALARM PANEL/MODULE
			3	2	3	4	5			
4081-9001	733-892	2.2K	RED	RED	RED	GLD	N/A	1/2	ANNUNCIATOR (4300)	4004, 4010 (TROUBLE)
4081-9002	733-893	3.3K	ORG	ORG	RED	GLD	N/A	1	N.O. INITIATING PULL, SMOKE, HEAT, WATERFLOW, TAMPER, ETC. 24 PT. I/O SWITCH SUPV.	4004*, 4004R, 4005*, 4006, 4100, 4120, 4100U, ZAMs 4605-7401, 4100 SERIES
4081-9003	733-896	4.7K	YEL	VT	RED	GLD	N/A	1/2	CURRENT LIMITED N.O. INIT., NOTIFICATION (DACT)	4090 IDNET IAM (EOLR) 2080-9024
4081-9004	733-886	6.8K	BLU	GRY	RED	GLD	N/A	1/2	N/O INITIATING PULL, SMOKE, HEAT, W.FLOW, TAMPER, ETC	4004, 4005, 4090-9001 IDNET IAM, 2190-9173 MAPNETII 2 PT I/O; 4-20MA ZAM (TROUBLE)
4081-9005	733-984	1.8K	BRN	GRY	RED	GLD	N/A	1/2	CURRENT LIMITED N.O. INITIATING (INLINE)	4090-9001 IDNET IAM
4081-9006	733-890	560	GRN	BLU	BRN	GLD	N/A	1	N.C. INITIATING (EOLR)	4005*, 4090-9001 IDNET IAM 4100, 4100U
4081-9007	733-891	1.2K	BRN	RED	RED	GLD	N/A	1	N.C. INITIATING (EOLR)	4005
4081-9008	733-894	10K	BRN	BLK	ORG	GLD	N/A	1/2	NOTIFICATION	4004, 4005, 4006, 4008, 4009, 4010, 4100, 4100U
4081-9009	733-912	20	RED	BLK	BLK	GLD	N/A	1	TO MR-101 RELAY COIL	4005 8 POINT I/O
4081-9010	733-973	1K	BRN	BLK	RED	GLD	N/A	1	N.C. INIT. (ACROSS CONTACTS)	4005*, 4090-9001 IDNET IAM
									24 PT. I/O (ACROSS CONTACTS	4605-7401, 4100 SERIES
									CURRENT LIMITED N.O. INIT. (IN SERIES WITH CONTACT)	4090-9001 IDNET IAM
4081-9011	733-974	100	BRN	BLK	BRN	GLD	N/A	1/2	ANNUNCIATOR (N2)	4006, 4008, 4010
4081-9012	733-985	22K	RED	RED	ORG	GLD	N/A	1/2	SPEAKER CIRCUIT	4003
4081-9013	734-086	4.99K	YEL	WHT	WHT	BRN	BRN	1/2		
4081-9014	734-092	2.4K	RED	YEL	RED	GLD	N/A	1/2	N.C. INITIATING (SECURITY MONITORING EOLR)	4090-9001 IDNET IAM
4081-9015	734-093	1.5K	BRN	GRN	RED	GLD	N/A	1/2	CURRENT LIMITED N.O. INIT. (SECURITY MONITORING EOLR)	4090-9001 IDNET IAM
4081-9016	734-149	150K	BRN	GRN	YEL	GLD	N/A	1/2		
4081-9017	734-171	3.9K	ORG	WHT	RED	GLD	N/A	1		
4081-9018	734-168	10K	BRN	BLK	ORG	GLD	N/A	1	70VRMS CONSTANT SUPV. NAC	4100-1260
	378-090	8.2K	GRY	RED	RED	GLD	N/A	1/2	SECURITY MONITORING (EOLR)	4100, 4100U
	378-046	5.6K	GRN	BLU	RED	GLD	N/A	1/2	N.O. SECURITY MON. (SERIES)	4100, 4100U
	378-069	12K	BRN	RED	ORG	GLD	N/A	1/2	N.C. SECURITY MON. (SHUNT)	4100, 4100U

* USE WITH RETROFIT OR HIGH CURRENT MODULE

DUCT SMOKE DETECTOR INSTALLATION GUIDE

PRE-INSTALLATION ROUTINES

DUCT DETECTORS/SENSORS SHOULD BE INSTALLED IN A LOCATION OF RELATIVELY NON-TURBULENT AIR FLOW AND WITHIN THE INTENDED OPERATING VELOCITY RANGE OF 300-4000 FEET-PER-MINUTE (91 TO 1220 M/MIN.)

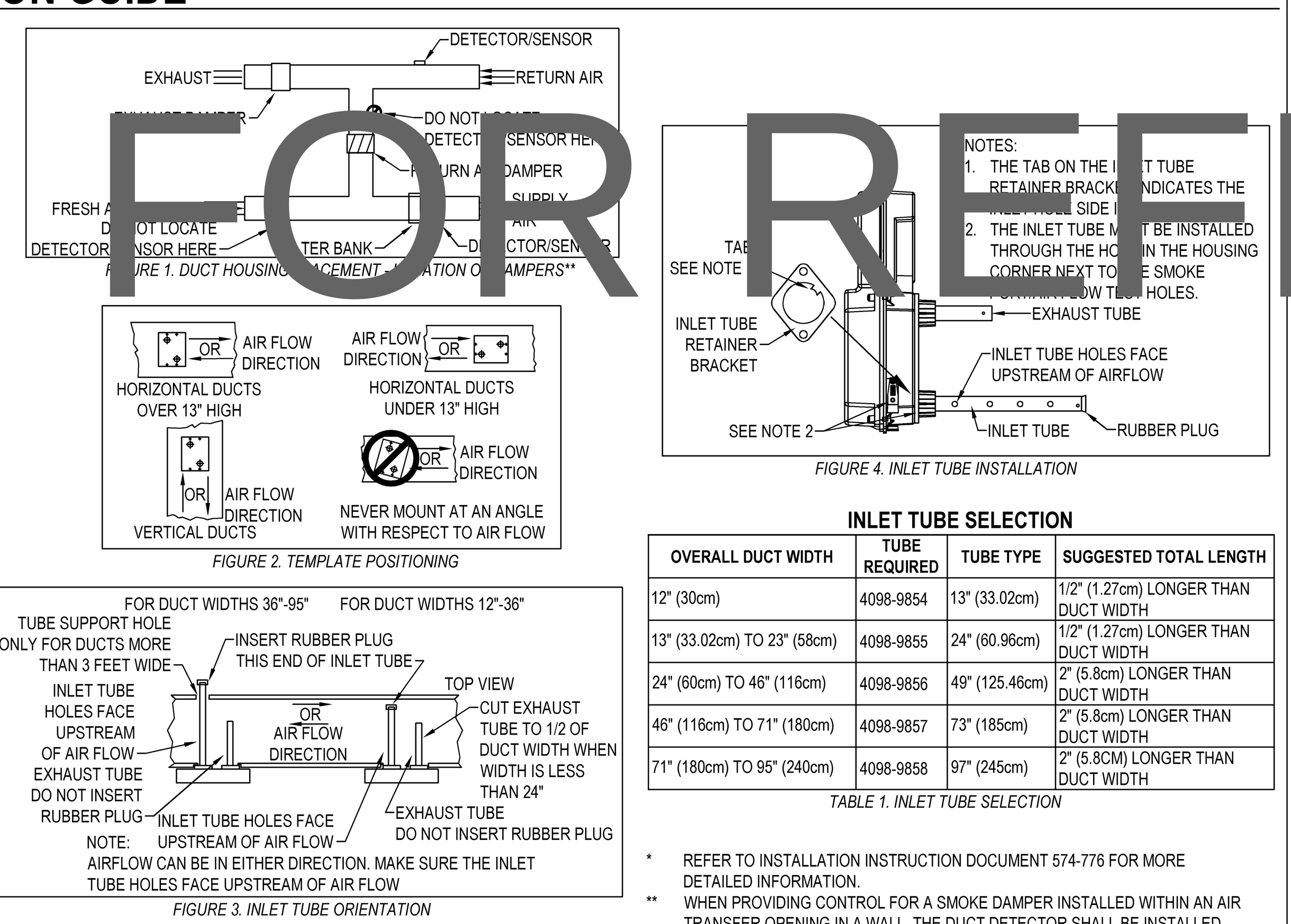
MEASUREMENTS OF AIR FLOW AND EXAMINATION OF ENGINEERING SPECIFICATIONS THAT DEFINE EXPECTED DUCT AIR VELOCITIES UNDER ALL CONDITIONS IS RECOMMENDED. THIS IS DONE TO DETERMINE IF A LOCATION IS SUITABLE FOR DUCT DETECTOR/SENSOR OPERATION. AN ALNOR INSTRUMENT CO. (CHICAGO) MODEL 6000P VELOMETER OR EQUIVALENT (NOT SUPPLIED) MAY BE USED TO CHECK THE DUCT AIR VELOCITY.

INSTALLATION GUIDELINES

1. LOCATE DUCT HOUSINGS SO THAT DAMPERS DO NOT RESTRICT AIR FLOW AT THE DETECTOR/SENSOR LOCATION. SEE FIGURE 1.
2. LOCATE AIR DUCT DETECTORS/SENSORS ON THE RETURN OR SUPPLY DUCT OF THE EQUIPMENT'S AIR HANDLING SYSTEM. HOWEVER, DETECTORS/SENSORS SHOULD NOT BE INSTALLED IN THE RETURN AIR DAMPER BRANCH. SEE FIGURE 1.
3. LOCATE AIR DUCT DETECTORS/SENSORS ON BRANCH LINES IF CLOSE IDENTIFICATION OF THE ALARM SOURCE IS REQUIRED.
4. LOCATE AIR DUCT DETECTORS/SENSORS ON THE DOWNSTREAM SIDE OF FILTERS TO SENSE FIRE IN FILTERS. HOWEVER, SHOULD THE FILTERS BLOCK, SUFFICIENT AIR FLOW MAY NOT BE AVAILABLE FOR PROPER AIR DUCT DETECTOR/SENSOR OPERATION. SEE FIGURE 1.
5. WHENEVER POSSIBLE, LOCATE AIR DUCT DETECTORS/SENSORS WHERE THEY CAN BE CONVENIENTLY OBSERVED AND READILY SERVICED.
6. LOCATE THE AIR DUCT DETECTORS/SENSORS IN RETURN AIR DUCTS AHEAD OF MIXING AREAS.
7. DO NOT LOCATE AIR DUCT DETECTORS/SENSORS NEXT TO OUTSIDE AIR INLETS UNLESS YOU WANT TO MONITOR SMOKE ENTRY TO THE HANDLING SYSTEM FROM AN ADJACENT AREA.
8. LOCATE AIR DUCT DETECTORS/SENSORS UPSTREAM OF AIR HUMIDIFIERS AND COOLING COILS.
9. DO NOT INSTALL THE DUCT DETECTOR HOUSING OR DUCT TUBES IN LOCATIONS THAT EXCEED THE LISTED TEMPERATURE RATINGS FOR THE DEVICE.
10. DO NOT MOUNT THE DUCT HOUSING ON BOTTOM OF DUCT.

DUCT DETECTOR/SENSOR INSTALLATION

1. TAPE THE TEMPLATE (SUPPLIED) ON THE DUCT SURFACE. DO NOT POSITION THE TEMPLATE WITH EDGES ANGLED WITH RESPECT TO AIR FLOW DIRECTION. SEE FIGURE 2.
2. DRILL TWO 1 1/4 INCH (31.75 MM) HOLES (MARKED "A") AS LOCATED BY THE TEMPLATE. REMOVE TEMPLATE AFTER HOLES HAVE BEEN DRILLED.
3. IF THE DUCT IS MORE THAN 3 FEET (0.9 M) WIDE, THEN PUNCH A 1-INCH (25.4 MM) HOLE IN THE DUCT WALL DIRECTLY OPPOSITE THE UPSTREAM 1-1/4 INCH (31.75 MM) HOLE. SEE FIGURE 3. THIS HOLE IS USED TO SUPPORT THE INLET TUBE.
4. INLET TUBES SHOULD BE SELECTED AND CUT TO LENGTH AS SPECIFIED IN TABLE 1. AFTER TRIMMING THE INLET TUBE OPPOSITE THE SLOT, TAP RUBBER PLUG (SUPPLIED) INTO THE TRIMMED END. SEE FIGURE 3.



DETECTOR/SENSOR
EXHAUST
RETURN AIR
FRESH AIR
DETECTOR/SENSOR HERE
AIR FLOW DIRECTION
HORIZONTAL DUCTS OVER 13" HIGH
HORIZONTAL DUCTS UNDER 13" HIGH
VERTICAL DUCTS
NEVER MOUNT AT AN ANGLE WITH RESPECT TO AIR FLOW
FIGURE 2. TEMPLATE POSITIONING
FOR DUCT WIDTHS 36"-96"
FOR DUCT WIDTHS 12"-36"
TUBE SUPPORT HOLE ONLY FOR DUCTS MORE THAN 3 FEET WIDE
INSERT RUBBER PLUG THIS END OF INLET TUBE
TOP VIEW
INLET TUBE HOLES FACE UPSTREAM OF AIR FLOW
EXHAUST TUBE DO NOT INSERT RUBBER PLUG
CUT EXHAUST TUBE TO 1/2 OF DUCT WIDTH WHEN WIDTH IS LESS THAN 24"
NOTE: AIRFLOW CAN BE IN EITHER DIRECTION. MAKE SURE THE INLET TUBE HOLES FACE UPSTREAM OF AIR FLOW
FIGURE 3. INLET TUBE ORIENTATION
EXHAUST TUBE
INLET TUBE HOLES FACE UPSTREAM OF AIRFLOW
INLET TUBE RETAINER BRACKET
SEE NOTE 2
INLET TUBE
RUBBER PLUG
FIGURE 4. INLET TUBE INSTALLATION

INLET TUBE SELECTION

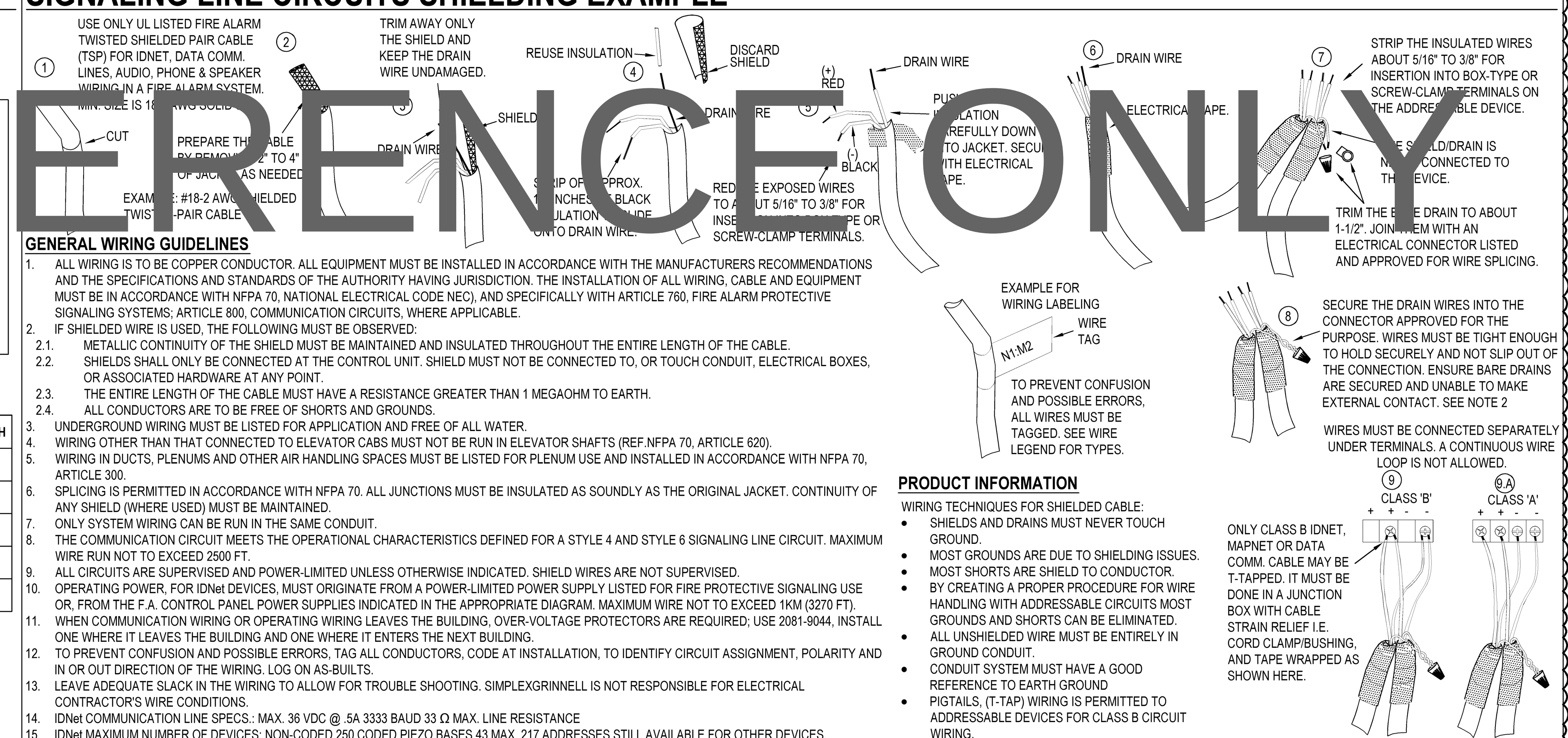
OVERALL DUCT WIDTH	TUBE REQUIRED	TUBE TYPE	SUGGESTED TOTAL LENGTH
12" (30cm)	4098-9854	13" (33.02cm)	1/2" (1.27cm) LONGER THAN DUCT WIDTH
13" (33.02cm) TO 23" (58cm)	4098-9855	24" (60.96cm)	1/2" (1.27cm) LONGER THAN DUCT WIDTH
24" (60cm) TO 46" (116cm)	4098-9856	49" (125.46cm)	2" (5.8cm) LONGER THAN DUCT WIDTH
46" (116cm) TO 71" (180cm)	4098-9857	73" (185cm)	2" (5.8cm) LONGER THAN DUCT WIDTH
71" (180cm) TO 95" (240cm)	4098-9858	97" (245cm)	2" (5.8CM) LONGER THAN DUCT WIDTH

TABLE 1. INLET TUBE SELECTION

* REFER TO INSTALLATION INSTRUCTION DOCUMENT 574-776 FOR MORE DETAILED INFORMATION.

** WHEN PROVIDING CONTROL FOR A SMOKE DAMPER INSTALLED WITHIN AN AIR TRANSFER OPENING IN A WALL, THE DUCT DETECTOR SHALL BE INSTALLED WITHIN 5 FEET HORIZONTALLY OF THE DAMPER.

SIGNALING LINE CIRCUITS SHIELDING EXAMPLE



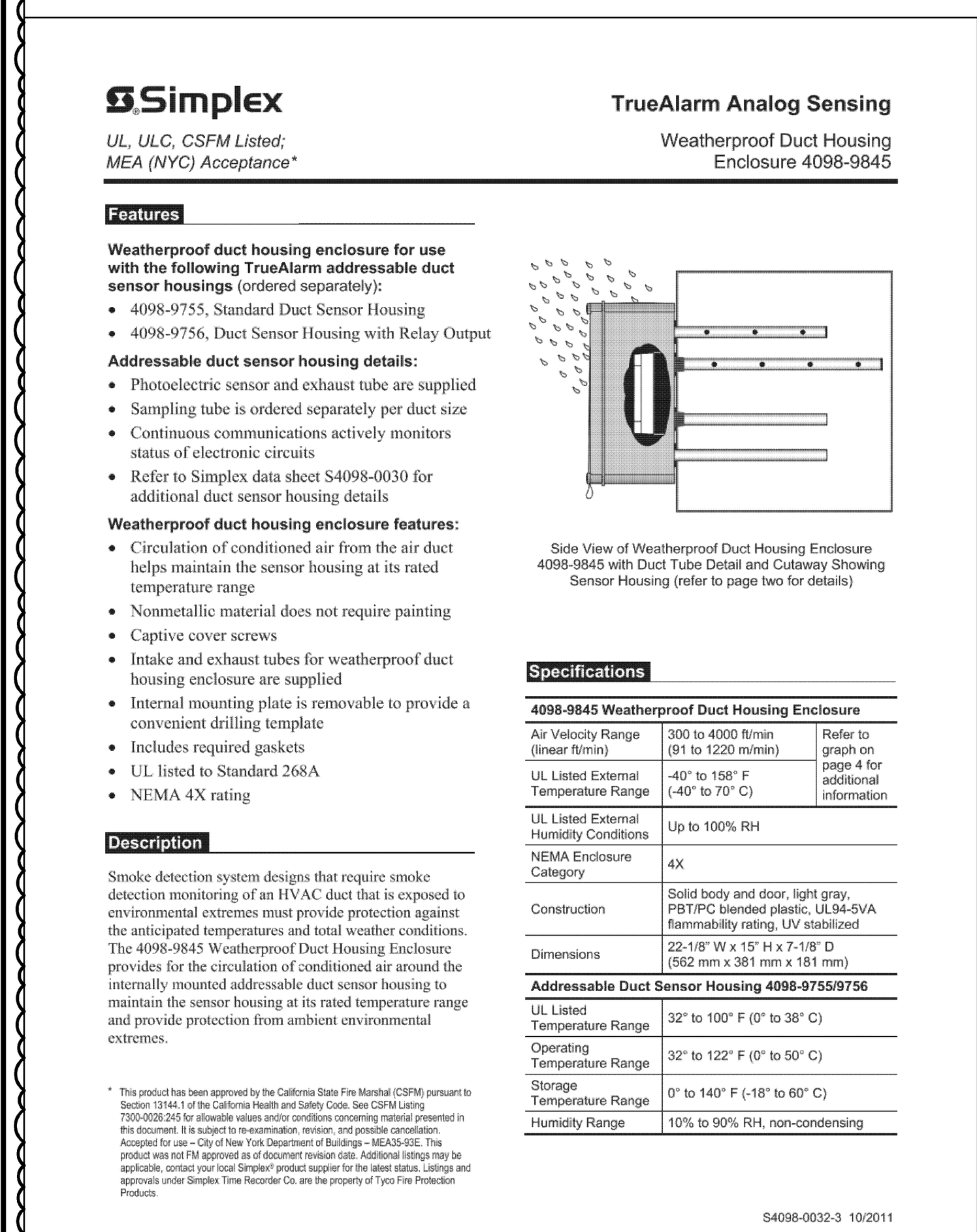
USE ONLY UL LISTED FIRE ALARM TWISTED SHIELDED PAIR CABLE (TSP) FOR IDNET, DATA COMM. LINES, AUDIO, PHONE & SPEAKER WIRING IN A FIRE ALARM SYSTEM.
CUT
PREPARE THE CABLE
EXAMPLE: #18-2 AWG SHIELDED TWISTED-PAIR CABLE
TRIM AWAY ONLY THE SHIELD AND KEEP THE DRAIN WIRE UNDAMAGED.
SHIELD
DRAIN WIRE
REUSE INSULATION
DISCARD SHIELD
(+) RED
(-) BLACK
ELECTRICAL TAPE.
DRAIN WIRE
STRIP THE INSULATED WIRES ABOUT 5/16" TO 3/8" FOR INSERTION INTO BOX-TYPE OR SCREW-CLAMP TERMINALS ON THE ADDRESSABLE DEVICE.
SCREW-CLAMP TERMINALS.
EXAMPLE FOR WIRING LABELING
WIRE TAG
N1:M2
TO PREVENT CONFUSION AND POSSIBLE ERRORS, ALL WIRES MUST BE TAGGED. SEE WIRE LEGEND FOR TYPES.
SECURE THE DRAIN WIRES INTO THE CONNECTOR APPROVED FOR THE PURPOSE. WIRES MUST BE TIGHT ENOUGH TO HOLD SECURELY AND NOT SLIP OUT OF THE CONNECTION. ENSURE BARE DRAINS ARE SECURED AND UNABLE TO MAKE EXTERNAL CONTACT. SEE NOTE 2
WIRES MUST BE CONNECTED SEPARATELY UNDER TERMINALS. A CONTINUOUS WIRE LOOP IS NOT ALLOWED.
CLASS 'B'
CLASS 'A'
ONLY CLASS B IDNET, MAPNET OR DATA COMM. CABLE MAY BE T-TAPPED. IT MUST BE DONE IN A JUNCTION BOX WITH CABLE STRAIN RELIEF I.E. CORD CLAMP/BUSHING, AND TAPE WRAPPED AS SHOWN HERE.

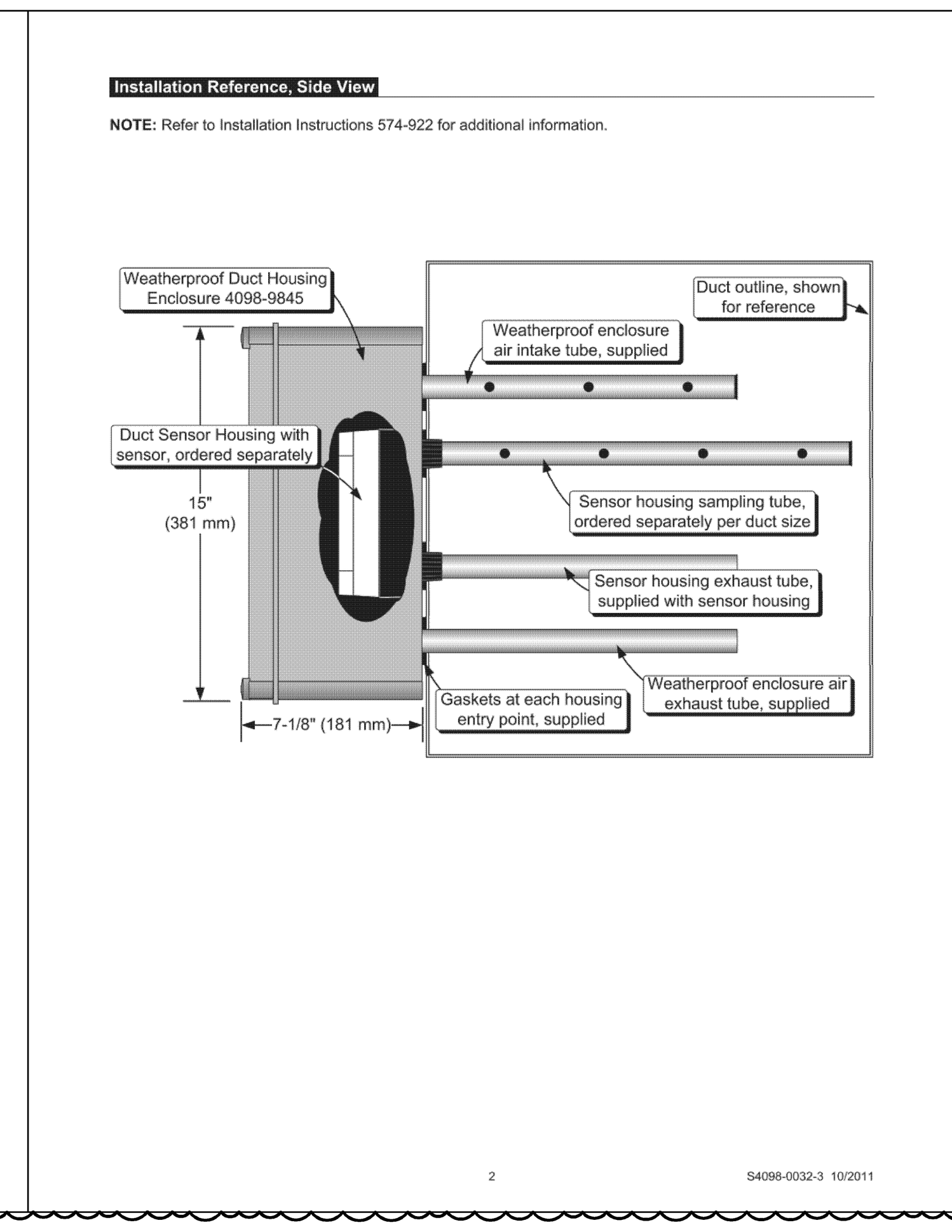
GENERAL WIRING GUIDELINES

1. ALL WIRING IS TO BE COPPER CONDUCTOR. ALL EQUIPMENT MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND THE SPECIFICATIONS AND STANDARDS OF THE AUTHORITY HAVING JURISDICTION. THE INSTALLATION OF ALL WIRING, CABLE AND EQUIPMENT MUST BE IN ACCORDANCE WITH NFPA 70, NATIONAL ELECTRICAL CODE NEC), AND SPECIFICALLY WITH ARTICLE 760, FIRE ALARM PROTECTIVE SIGNALING SYSTEMS; ARTICLE 800, COMMUNICATION CIRCUITS, WHERE APPLICABLE.
2. IF SHIELDED WIRE IS USED, THE FOLLOWING MUST BE OBSERVED:
   - 2.1. METALLIC CONTINUITY OF THE SHIELD MUST BE MAINTAINED AND INSULATED THROUGHOUT THE ENTIRE LENGTH OF THE CABLE.
   - 2.2. SHIELDS SHALL ONLY BE CONNECTED AT THE CONTROL UNIT. SHIELD MUST NOT BE CONNECTED TO, OR TOUCH CONDUIT, ELECTRICAL BOXES, OR ASSOCIATED HARDWARE AT ANY POINT.
   - 2.3. THE ENTIRE LENGTH OF THE CABLE MUST HAVE A RESISTANCE GREATER THAN 1 MEGAOHM TO EARTH.
   - 2.4. ALL CONDUCTORS ARE TO BE FREE OF SHORTS AND GROUNDS.
3. UNDERGROUND WIRING MUST BE LISTED FOR APPLICATION AND FREE OF ALL WATER.
4. WIRING OTHER THAN THAT CONNECTED TO ELEVATOR CABS MUST NOT BE RUN IN ELEVATOR SHAFTS (REF.NFPA 70, ARTICLE 620).
5. WIRING IN DUCTS, PLENUMS AND OTHER AIR HANDLING SPACES MUST BE LISTED FOR PLENUM USE AND INSTALLED IN ACCORDANCE WITH NFPA 70, ARTICLE 300.
6. SPLICING IS PERMITTED IN ACCORDANCE WITH NFPA 70. ALL JUNCTIONS MUST BE INSULATED AS SOUNDLY AS THE ORIGINAL JACKET. CONTINUITY OF ANY SHIELD (WHERE USED) MUST BE MAINTAINED.
7. ONLY SYSTEM WIRING CAN BE RUN IN THE SAME CONDUIT.
8. THE COMMUNICATION CIRCUIT MEETS THE OPERATIONAL CHARACTERISTICS DEFINED FOR A STYLE 4 AND STYLE 6 SIGNALING LINE CIRCUIT. MAXIMUM WIRE RUN NOT TO EXCEED 2500 FT.
9. ALL CIRCUITS ARE SUPERVISED AND POWER-LIMITED UNLESS OTHERWISE INDICATED. SHIELD WIRES ARE NOT SUPERVISED.
10. OPERATING POWER, FOR IDNet DEVICES, MUST ORIGINATE FROM A POWER-LIMITED POWER SUPPLY LISTED FOR FIRE PROTECTIVE SIGNALING USE OR, FROM THE F.A. CONTROL PANEL POWER SUPPLIES INDICATED IN THE APPROPRIATE DIAGRAM. MAXIMUM WIRE NOT TO EXCEED 1KM (3270 FT).
11. WHEN COMMUNICATION WIRING OR OPERATING WIRING LEAVES THE BUILDING, OVER-VOLTAGE PROTECTORS ARE REQUIRED; USE 2081-9044, INSTALL ONE WHERE IT LEAVES THE BUILDING AND ONE WHERE IT ENTERS THE NEXT BUILDING.
12. TO PREVENT CONFUSION AND POSSIBLE ERRORS, TAG ALL CONDUCTORS, CODE AT INSTALLATION, TO IDENTIFY CIRCUIT ASSIGNMENT, POLARITY AND IN OR OUT DIRECTION OF THE WIRING. LOG ON AS-BUILTS.
13. LEAVE ADEQUATE SLACK IN THE WIRING TO ALLOW FOR TROUBLE SHOOTING. SIMPLEXGRINNELL IS NOT RESPONSIBLE FOR ELECTRICAL CONTRACTOR'S WIRE CONDITIONS.
14. IDNet COMMUNICATION LINE SPECS.: MAX. 36 VDC @ .5A 3333 BAUD 33 Ω MAX. LINE RESISTANCE
15. IDNet MAXIMUM NUMBER OF DEVICES: NON-CODED 250 CODED PIEZO BASES 43 MAX. 217 ADDRESSES STILL AVAILABLE FOR OTHER DEVICES.

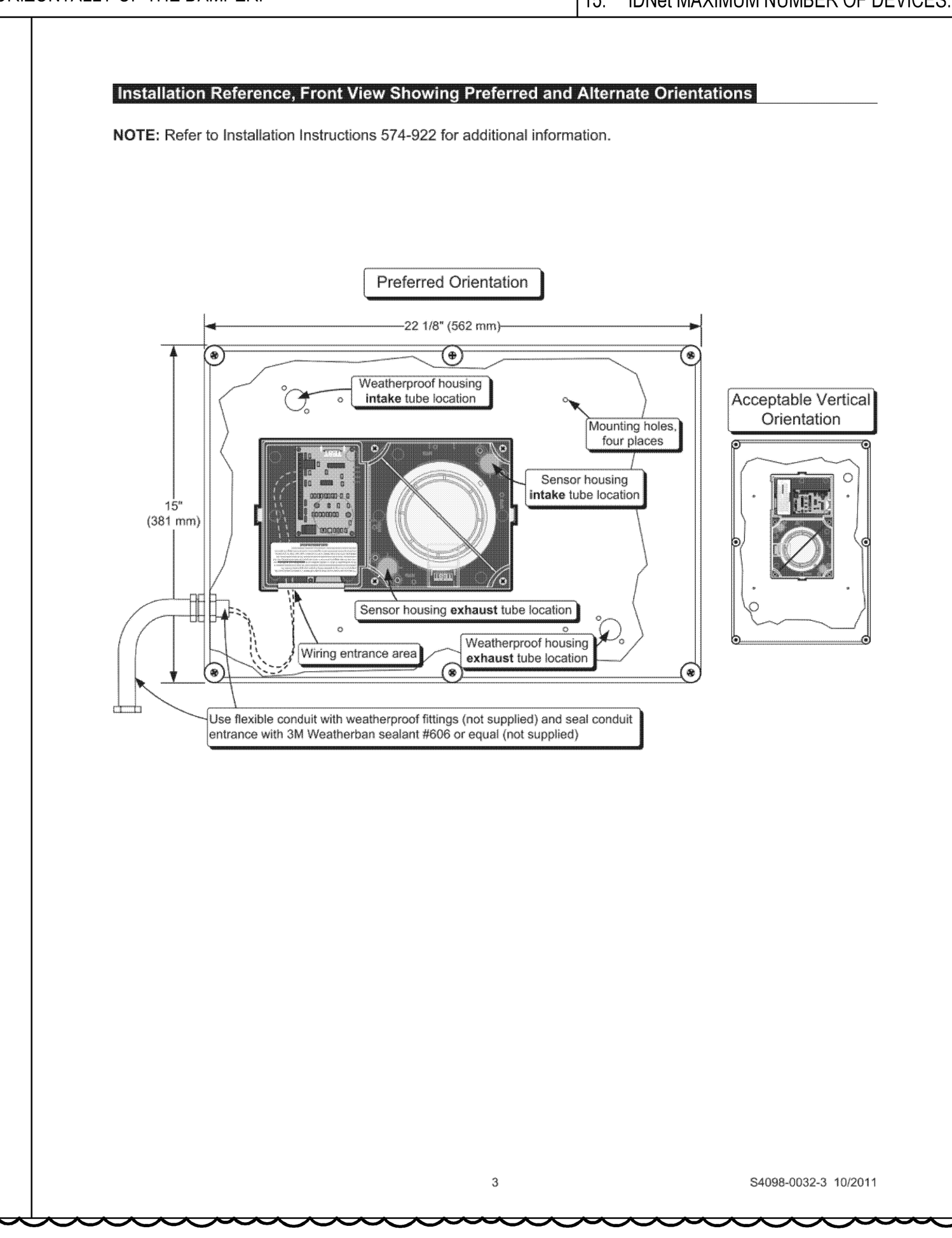
PRODUCT INFORMATION

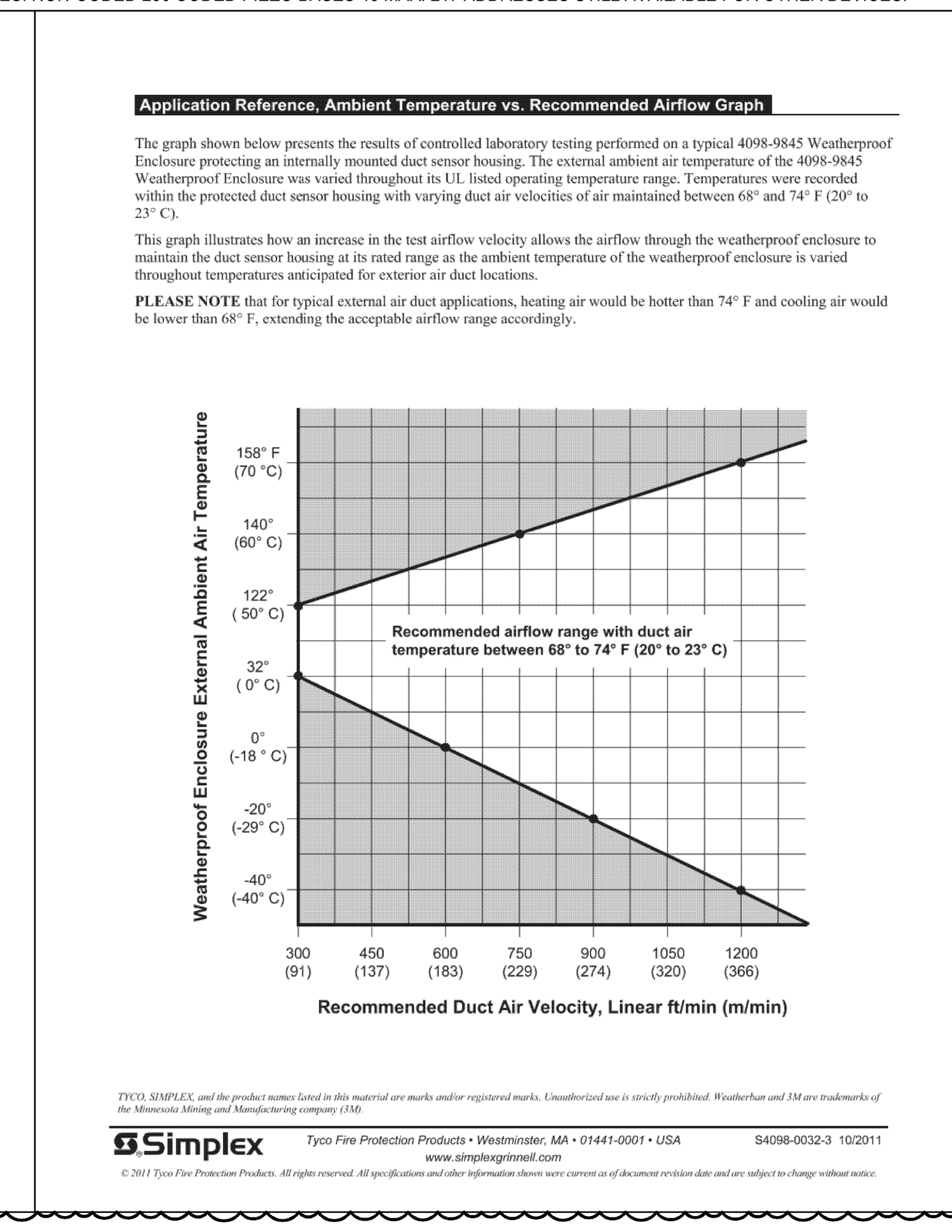
WIRING TECHNIQUES FOR SHIELDED CABLE:
- SHIELDS AND DRAINS MUST NEVER TOUCH GROUND.
- MOST GROUNDS ARE DUE TO SHIELDING ISSUES.
- MOST SHORTS ARE SHIELD TO CONDUCTOR.
- BY CREATING A PROPER PROCEDURE FOR WIRE HANDLING WITH ADDRESSABLE CIRCUITS MOST GROUNDS AND SHORTS CAN BE ELIMINATED.
- ALL UNSHIELDED WIRE MUST BE ENTIRELY IN GROUND CONDUIT.
- CONDUIT SYSTEM MUST HAVE A GOOD REFERENCE TO EARTH GROUND
- PIGTAILS, (T-TAP) WIRING IS PERMITTED TO ADDRESSABLE DEVICES FOR CLASS B CIRCUIT WIRING.





Installation Reference, Side View
NOTE: Refer to Installation Instructions 574-922 for additional information.
Weatherproof Duct Housing Enclosure 4098-9845
Duct outline, shown for reference
Weatherproof enclosure air intake tube, supplied
Duct Sensor Housing with sensor, ordered separately
Sensor housing sampling tube, ordered separately per duct size
Sensor housing exhaust tube, supplied with sensor housing
Gaskets at each housing entry point, supplied
Weatherproof enclosure air exhaust tube, supplied





Application Reference, Ambient Temperature vs. Recommended Airflow Graph
The graph shown below presents the results of controlled laboratory testing performed on a typical 4098-9845 Weatherproof Enclosure protecting an internally mounted duct sensor housing. The external ambient air temperature of the 4098-9845 Weatherproof Enclosure was varied throughout its UL listed operating temperature range. Temperatures were recorded within the protected duct sensor housing with varying duct air velocities of air maintained between 68° and 74° F (20° to 23° C).
Recommended airflow range with duct air temperature between 68° to 74° F (20° to 23° C)
Weatherproof Enclosure External Ambient Air Temperature
Recommended Duct Air Velocity, Linear ft/min (m/min)
Simplex

BATTLE CREEK PUBLIC SCHOOLS
DUDLEY ELEMENTARY

DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

Revisions shown with △ symbol

ISSUE LOG:

MARK	DATE	CAD	CHK	DESCRIPTION
2	01/20/23	AB	SP	650302115 - DUCT DETECTOR ADD
1	05/11/00	DCV	-	000157-01 - ISSUED FOR STATE REVIEW

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321:650302115

SYSTEM: FIRE ALARM SYSTEM

SHEET: TYPICAL DETAILS

FA-702

Johnson Controls
DISTRICT - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-343-9797
PHONE: 248-427-5050
FAX: 248-426-6655

FILE PATH: C:\$MY PROJECTS\In Progress\650302115 - BATTLE CREEK DUDLEY HVAC\FA-701 THRU 703.dwg
LAST SAVED BY: JBUCKA
LAST PRINTED: 1/19/2023 10:13:24 AM
30" x 42" - Arch E1 Size

4099-9003 IDNet DOUBLE ACTION PUSH STATION

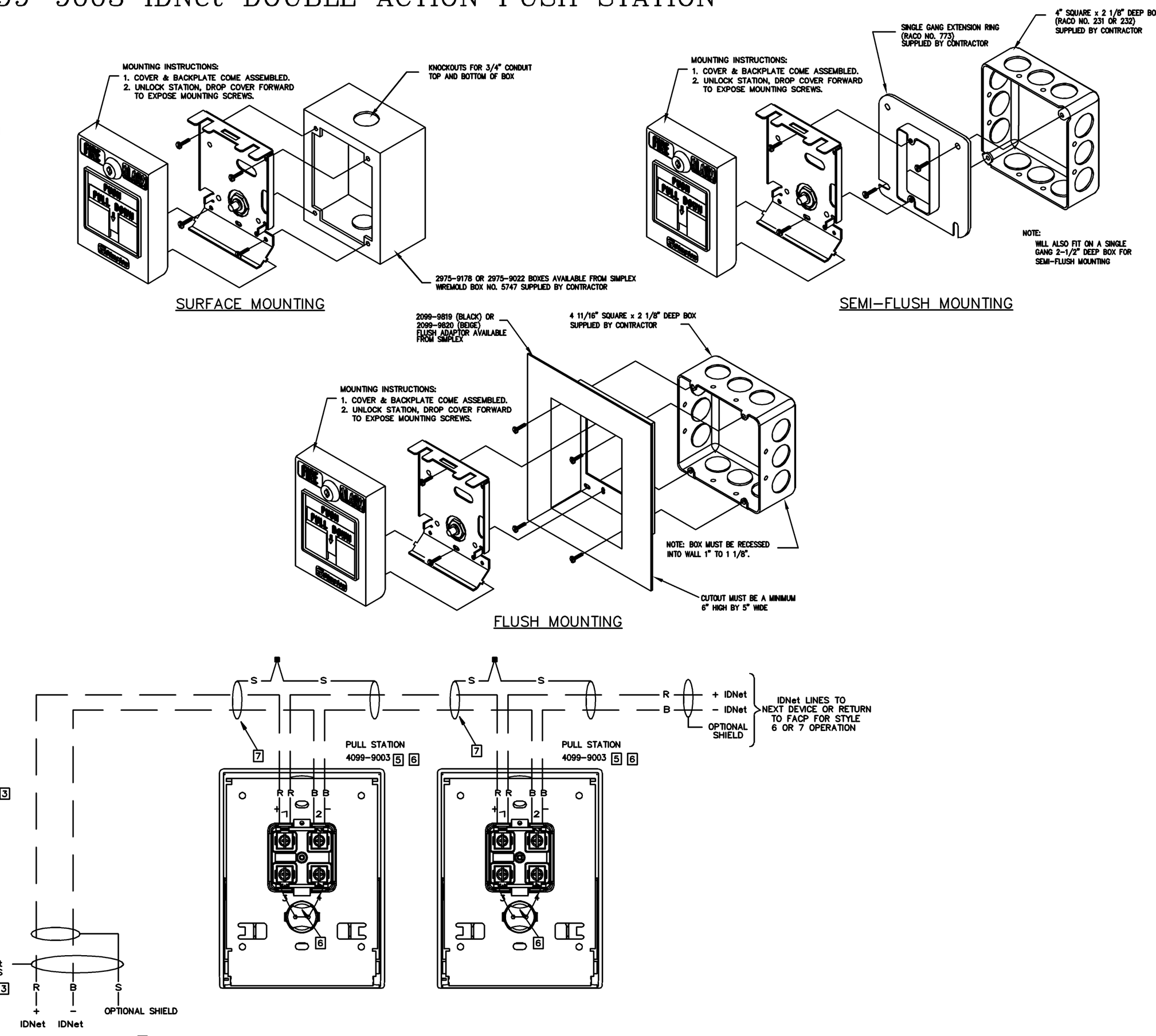
PRODUCT INFORMATION

SPECIFICATIONS

- POWER & COMMUNICATIONS: IDNet, 1 ADDRESS PER STATION, UP TO 2500 FT. FROM FIRE ALARM CONTROL PANEL, UP TO 10,000 FT. TOTAL WIRING DISTANCE (INCLUDING T-TAPS)
- ADDRESS MEANS: DIPSWITCH, 8 POSITION
- WIRE CONNECTIONS: SCREW TERMINAL FOR IN/OUT WIRING, FOR #18 TO #14 AWG WIRE
- UL LISTED TEMP. RANGE: 32° F TO 120° F (0° C TO 49° C) INTENDED FOR INDOOR OPERATION
- HUMIDITY RANGE: UP TO 93% RH AT 100° F (38° F)
- HOUSING COLOR: RED WITH WHITE RAISED LETTERING
- MATERIAL: HOUSING AND PULL LEVER ARE LEXAN POLYCARBONATE
- PULL LEVER COLOR: WHITE WITH RED RAISED LETTERING
- HOUSING DIMENSIONS: 5" H X 3-3/4" W X 1" D

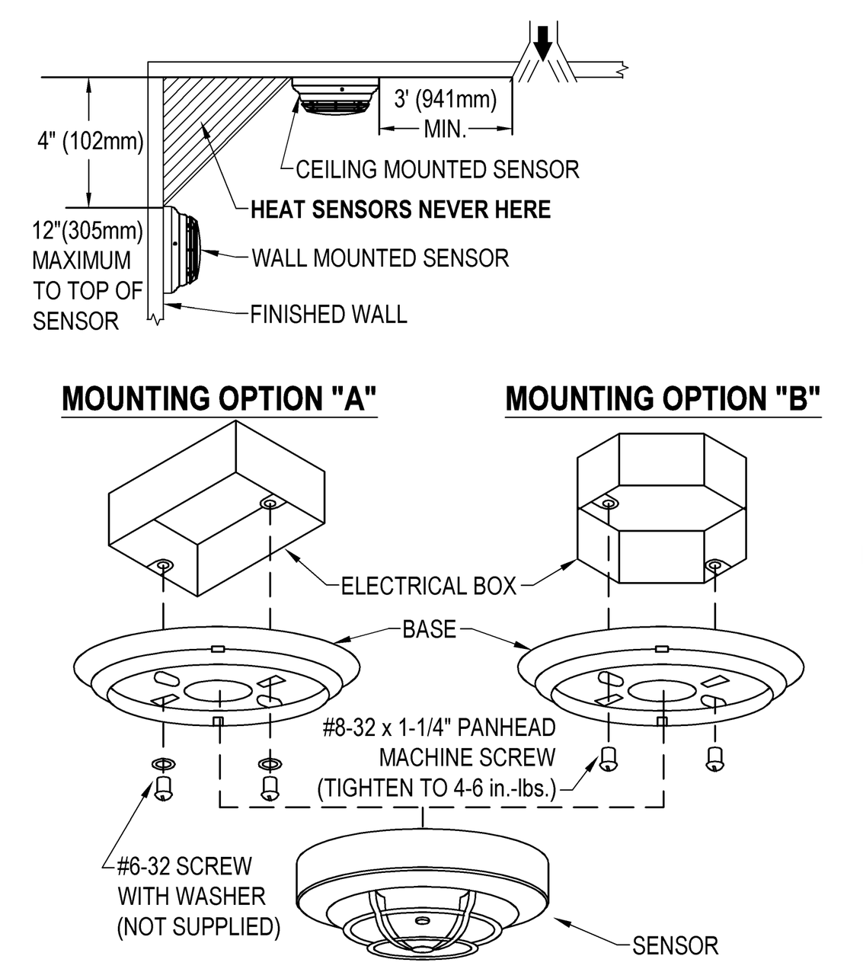
WIRE NOTES:

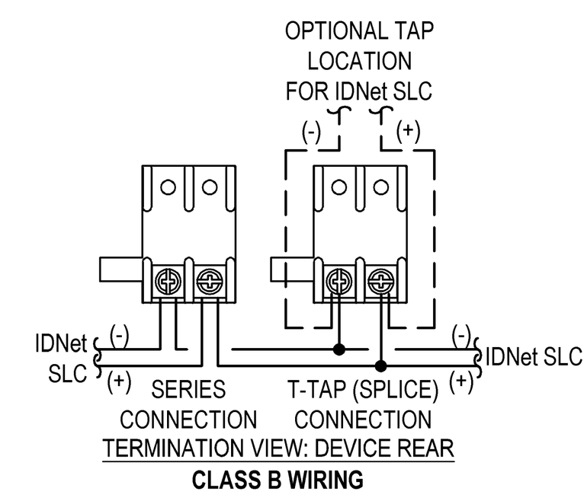
1. IDNet LINES ARE TO BE #18 AWG TWISTED PAIR (CONSULT YOUR SIMPLEX BRANCH FOR EXCEPTIONS) SHIELD RECOMMENDED.
2. MAXIMUM ALLOWABLE LINE RUN, FROM F.A.C.P. TO FARTHEST DEVICE, NOT TO EXCEED 2500 FEET.
3. MAXIMUM TOTAL WIRE (INCLUDING ALL T-TAPS) ON CIRCUIT, FROM F.A.C.P. NOT TO EXCEED 10,000 FEET OR .58uF.
4. MAXIMUM QUANTITY OF DEVICES PER CIRCUIT: 250.
5. SEE INSTALLATION INSTRUCTIONS 574-332.
6. TERMINALS 1 AND 2 FOR FIELD WIRING. TERMINALS 3 AND 4 ARE FACTORY WIRING.
7. IF SHIELD IS PRESENT, IT SHOULD BE CONNECTED TO THE OUTGOING IDNet SHIELD TO PROVIDE A CONTINUOUS SHIELD OVER THE LENGTH OF THE IDNet CHANNEL. SHIELD SHOULD BE INSULATED FROM ELECTRICAL BOX.



STANDARD SENSOR BASE

SIMPLEX 4098-9792





WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS.

MOUNTING OPTIONS

OPTION [1]	DESCRIPTION	NOTE
A	SINGLE GANG BOX, 2-1/8" (54mm) DEEP - FLUSH MOUNT	BY OTHERS
B	4" (102mm) OCTAGONAL BOX, 1-1/2" (38mm) DEEP, MINIMUM - FLUSH MOUNT	BY OTHERS
C	4" (102mm) SQUARE BOX, 1-1/2" DEEP (MIN) W/ SIMPLEX 4098-9832 ADAPTER KIT	BOX BY OTHERS, 4098-9832 ORDERED SEPARATELY
D	4" (102mm) SQUARE BOX, 1-1/2" DEEP (MIN) W/ SINGLE GANG COVER PLATE 3/4" (19mm) EXTENSION	BY OTHERS

1. FOR ADDITIONAL MOUNTING OPTIONS, DOWNLOAD DATA SHEET 4098-0019 FROM HTTP://WWW.SIMPLEX-FIRE.COM

4098-9753 TRUEALARM DUCT SENSOR HOUSING WITH RELAY OUTPUT

PRODUCT INFORMATION

FEATURES:

- UL LISTED TO STANDARD 268A
- MONITORS AIR DUCTS FOR THE PRESENCE OF SMOKE
- FOR USE WITH 4098-9714 TRUEALARM PHOTOELECTRIC SMOKE SENSOR
- RELAY OPERATION IS PROGRAMMABLE FROM FIRE ALARM CONTROL PANEL
- 24VDC POWER IS SUPPLIED BY FIRE ALARM SYSTEM FOR RELAY CONTROL.
- VISIBLE RED LED INDICATOR ON HOUSING
  - PULSING INDICATES POWER-ON, STEADY ON INDICATES ALARM OR TROUBLE AS INDICATED AT THE FIRE ALARM CONTROL PANEL
- BASE MOUNTED ADDRESS SELECTION
  - REMAINS WITH LOCATION
  - ACCESSIBLE FROM FRONT (UNDER SENSOR)

SPECIFICATIONS:

- AIR VELOCITY: 400 TO 4000 FT./MIN.
- DATA COMMUNICATIONS: SIMPLEX MAPNET II/IDNet
  INPUT VOLTAGE: 24 TO 40 VDC
  CURRENT: 400uA TYPICAL (800uA WHEN RELAY IS ACTIVATED IN ALARM)
- REMOTE LED CURRENT: 1.7mA NOMINAL
- RELAY INPUT VOLTAGE: 18 TO 32VDC
- RELAY AVERAGE SUPERVISORY CURRENT: 240uA
- RELAY ALARM CURRENT: 32mA MAX.
- AUXILIARY ALARM RELAY CONTACTS: FORM "C", 1A @ 28 VDC, FOR TRANSIENT SUPPRESSED LOADS
- UL LISTED TEMPERATURE RANGE: 32° F TO 100° F
- OPERATING TEMPERATURE RANGE: 32° F TO 122° F
- HUMIDITY RANGE: 10% TO 95%, RH FROM 32° F TO 122° F
- WIRING CONNECTIONS: TERMINAL BLOCKS, #18 TO #14 AWG

APPLICATION:

PREFERRED DUCT SENSOR LOCATIONS:

1. A MINIMUM OF SIX DUCT WIDTHS DOWNSTREAM FROM BENDS OR INLETS TO AVOID AIR TURBULENCE.
2. ON THE DOWNSTREAM SIDE OF FILTERS TO DETECT FIRES IN THE FILTERS.
3. IN RETURN DUCTS, AHEAD OF MIXING AREAS.
4. UPSTREAM OF AIR HUMIDIFIER AND COOLING COILS.
5. WITH ACCESSIBILITY FOR TEST AND SERVICE.
6. FOR ADDITIONAL INFORMATION, REFER TO NFPA 90A, STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS.

LOCATIONS TO AVOID:

1. WHERE DAMPERS CLOSED FOR COMFORT CONTROL WOULD INTERFERE WITH AIRFLOW.
2. NEXT TO OUTSIDE AIR INLETS (UNLESS THE INTENT IS TO MONITOR SMOKE ENTRY FROM THAT AREA).
3. IN RETURN AIR DAMPER BRANCH DUCTS AND MIXING AREAS WHERE AIRFLOW MAY BE RESTRICTED.

REMOTE INDICATOR OPTIONS:

2098-9806: REMOTE TEST STATION, PROVIDES A REMOTE RED LED STATUS INDICATOR AND A REMOTE TEST KEY SWITCH MOUNTED ON A SINGLE GANG STAINLESS STEEL PLATE. TURNING THE TEST SWITCH TO "TEST" WILL INITIATE AN ALARM AND ALLOW THE RESULTING SYSTEM RESPONSES TO BE VERIFIED.

2098-9808: REMOTE ALARM INDICATOR, PROVIDES A REMOTE RED LED STATUS INDICATOR MOUNTED ON A SINGLE GANG STAINLESS STEEL PLATE.

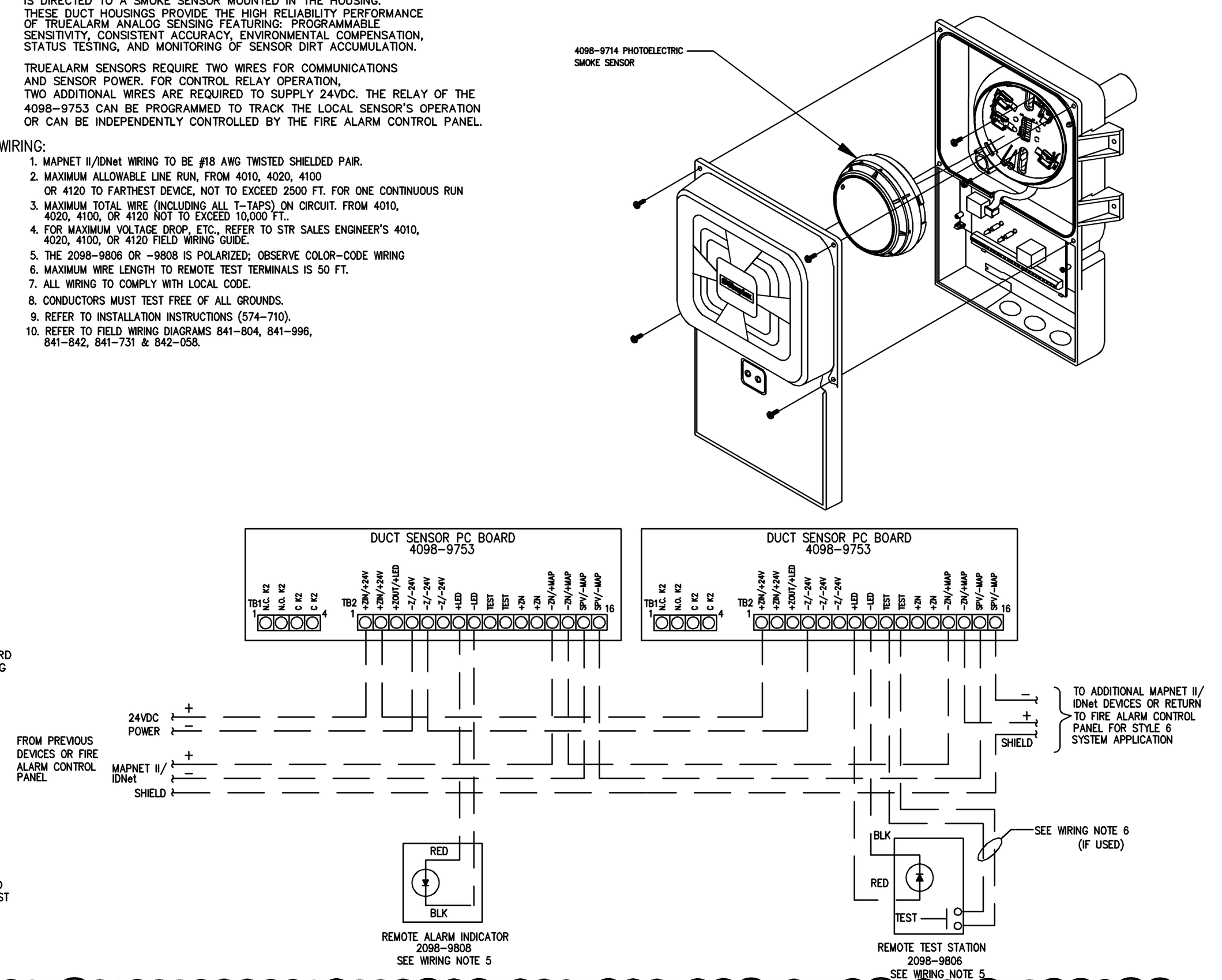
DESCRIPTION:

SIMPLEX TRUEALARM AIR DUCT SMOKE SENSOR HOUSINGS DETECT THE PRESENCE OF SMOKE IN AIR CONDITIONING OR VENTILATING DUCTS. SAMPLING TUBES ARE INSTALLED INTO THE DUCT AND AIR IS DIRECTED TO A SMOKE SENSOR MOUNTED IN THE HOUSING. THESE DUCT HOUSINGS PROVIDE THE HIGH RELIABILITY PERFORMANCE OF TRUEALARM ANALOG SENSING FEATURING: PROGRAMMABLE SENSITIVITY, CONSISTENT ACCURACY, ENVIRONMENTAL COMPENSATION, STATUS TESTING, AND MONITORING OF SENSOR DIRT ACCUMULATION.

TRUEALARM SENSORS REQUIRE TWO WIRES FOR COMMUNICATIONS AND SENSOR POWER. FOR CONTROL RELAY OPERATION, TWO ADDITIONAL WIRES ARE REQUIRED TO SUPPLY 24VDC. THE RELAY OF THE 4098-9753 CAN BE PROGRAMMED TO TRACK THE LOCAL SENSOR'S OPERATION OR CAN BE INDEPENDENTLY CONTROLLED BY THE FIRE ALARM CONTROL PANEL.

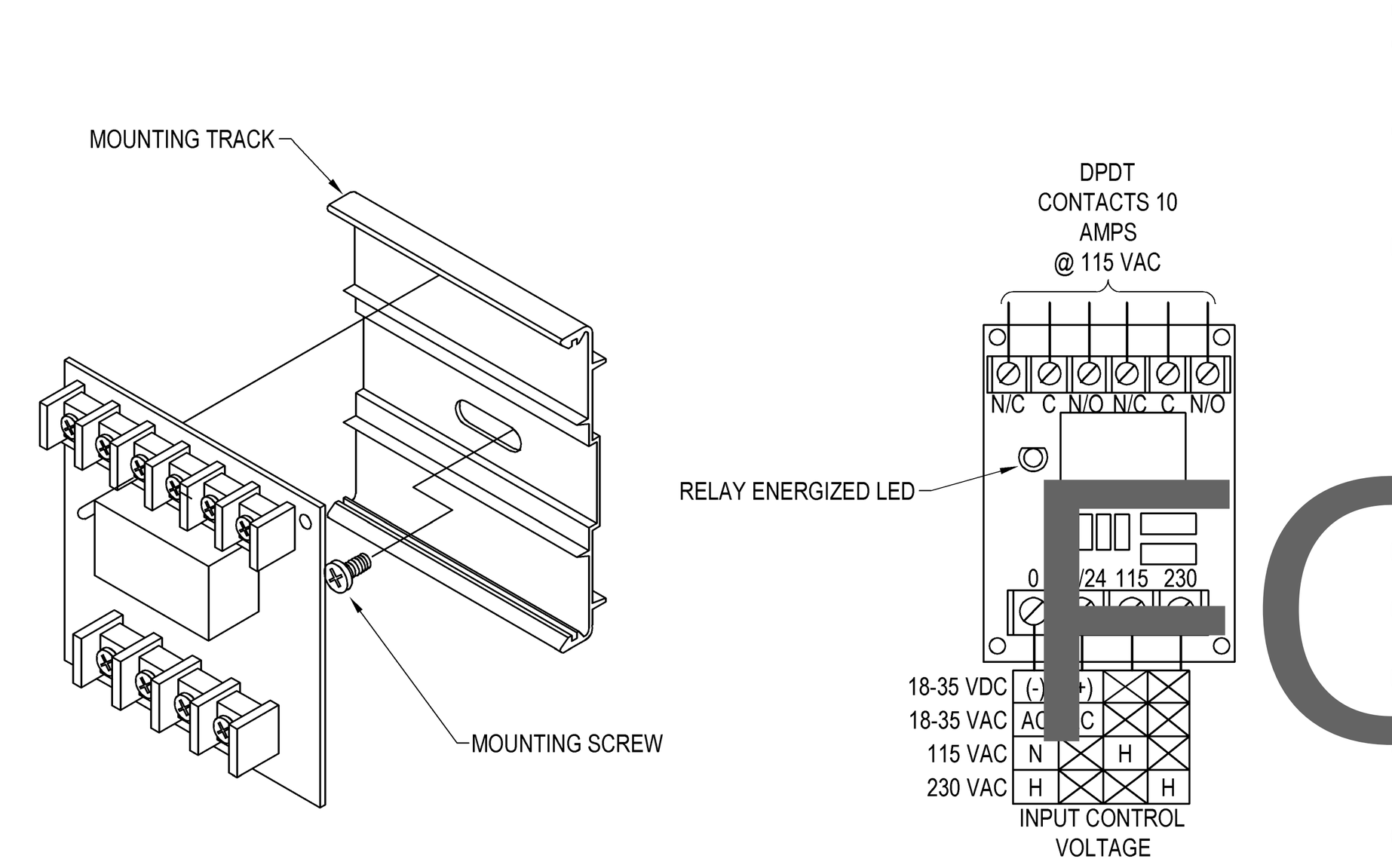
WIRING:

1. MAPNET II/IDNet WIRING TO BE #18 AWG TWISTED SHIELDED PAIR.
2. MAXIMUM ALLOWABLE LINE RUN, FROM 4010, 4020, 4100 OR 4120 TO FARTHEST DEVICE, NOT TO EXCEED 2500 FT. FOR ONE CONTINUOUS RUN
3. MAXIMUM TOTAL WIRE (INCLUDING ALL T-TAPS) ON CIRCUIT. FROM 4010, 4020, 4100, OR 4120 NOT TO EXCEED 10,000 FT..
4. FOR MAXIMUM VOLTAGE DROP, ETC., REFER TO STR SALES ENGINEER'S 4010, 4020, 4100, OR 4120 FIELD WIRING GUIDE.
5. THE 2098-9806 OR -9808 IS POLARIZED; OBSERVE COLOR-CODE WIRING
6. MAXIMUM WIRE LENGTH TO REMOTE TEST TERMINALS IS 50 FT.
7. ALL WIRING TO COMPLY WITH LOCAL CODE.
8. CONDUCTORS MUST TEST FREE OF ALL GROUNDS.
9. REFER TO INSTALLATION INSTRUCTIONS (574-710).
10. REFER TO FIELD WIRING DIAGRAMS 841-804, 841-996, 841-842, 841-731 & 842-058.



DPDT CONTROL RELAY

SIMPLEX 2088-9009 / APOLLO AMERICA MR-201/T



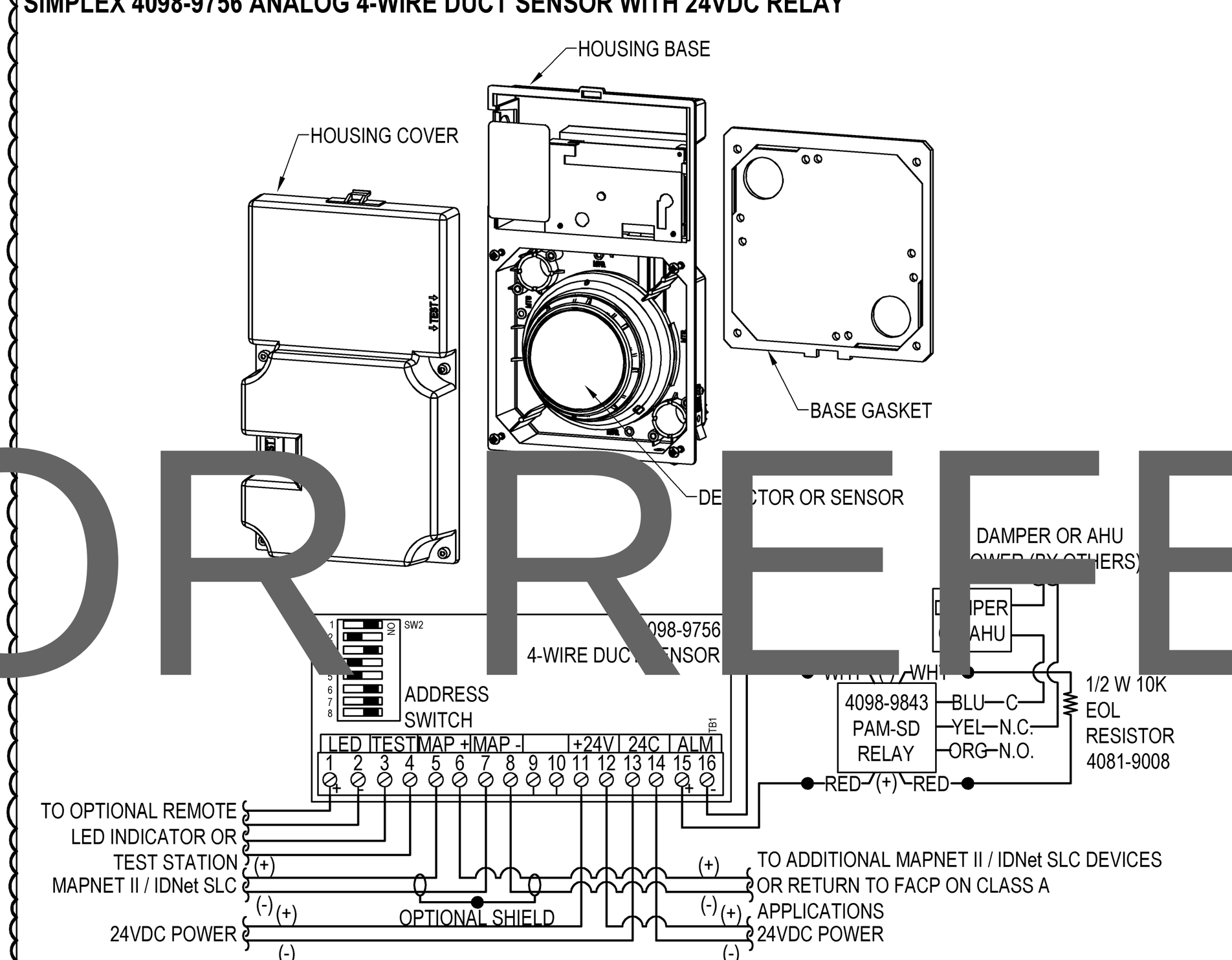
WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON CONNECTIONS.
2. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS. CLASS B APPLICATIONS ONLY.

FOR ADDITIONAL DETAILS SEE DATA SHEET 2088-0010 ON HTTP://WWW.SIMPLEX-FIRE.COM

DUCT SMOKE DETECTOR

SIMPLEX 4098-9756 ANALOG 4-WIRE DUCT SENSOR WITH 24VDC RELAY

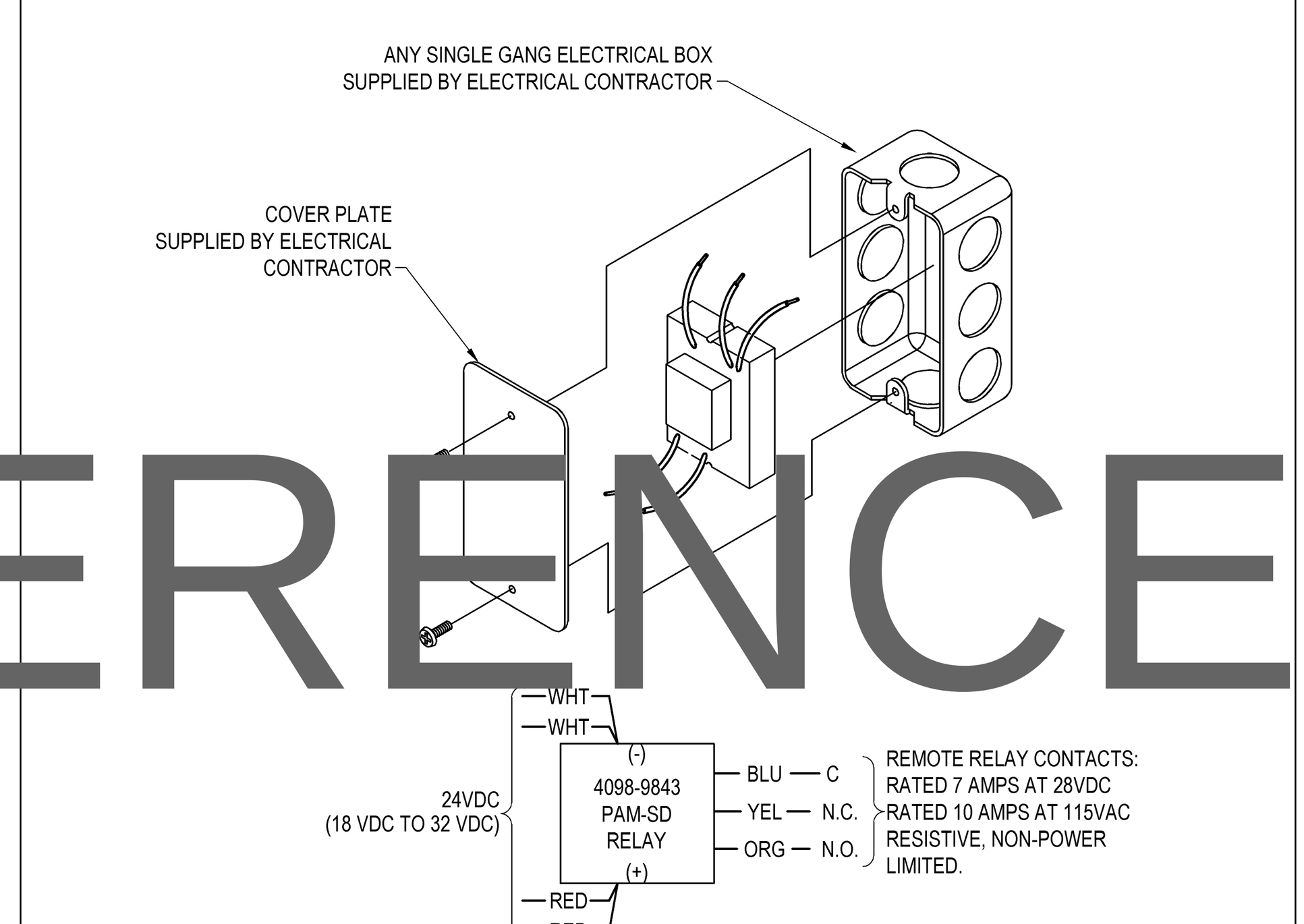


WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS. CLASS B APPLICATIONS ONLY.

24VDC POLARIZED RELAY

SIMPLEX 4098-9843 / APOLLO AMERICA PAM-SD



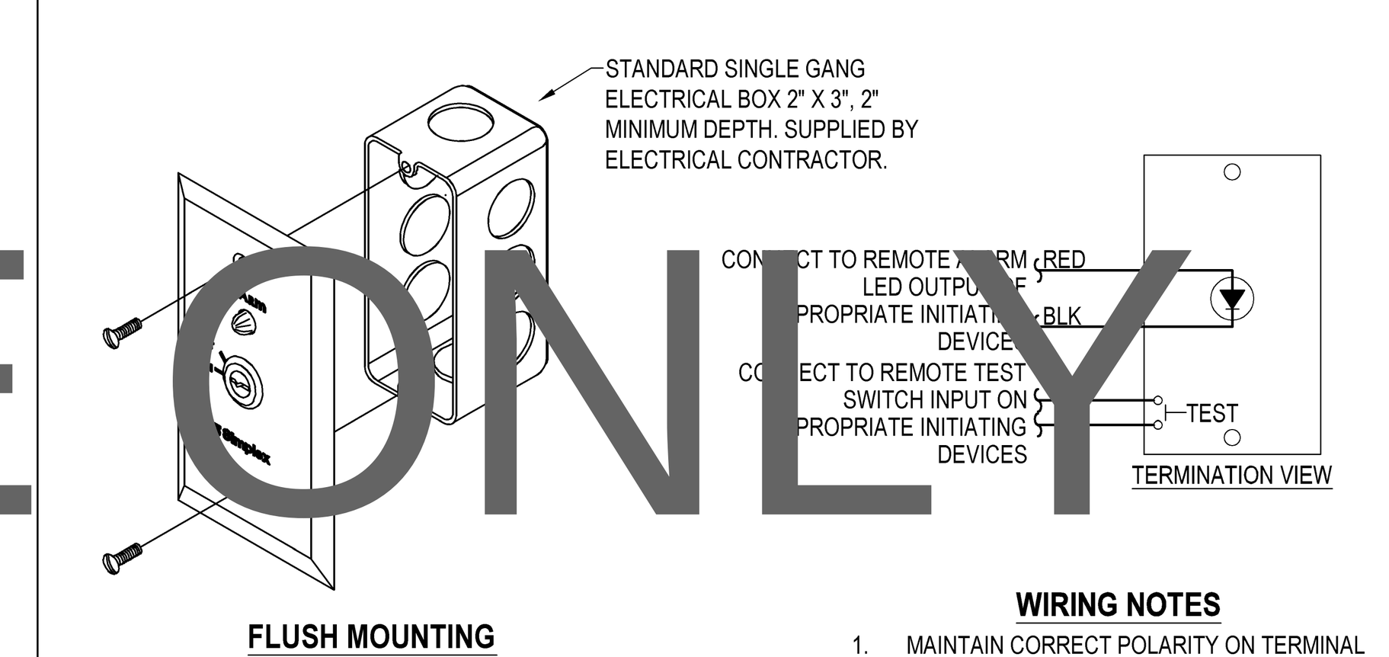
WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON CONNECTIONS.
2. ANY WIRE SPLICES TO BE MADE BY LISTED AND AHJ APPROVED METHODS. CLASS B APPLICATIONS ONLY.

FOR ADDITIONAL DETAILS SEE DATA SHEET 2088-0010 ON HTTP://WWW.SIMPLEX-FIRE.COM

REMOTE ALARM INDICATOR / KEY SWITCH

SIMPLEX 2098-9806



WIRING NOTES

1. MAINTAIN CORRECT POLARITY ON TERMINAL CONNECTIONS.
2. ALWAYS CUT CONDUCTORS AND SECURE UNDER TERMINALS. NEVER LOOP WIRES UNDER TERMINALS.
3. ONE INDICATOR MAY BE INSTALLED PER DETECTOR.

FOR REFERENCE ONLY

QUICKALERT™ SYNCHRONIZED AUDIO/VISIBLE NOTIFICATION APPLIANCES

PRODUCT INFORMATION

FEATURES:

- CLASS B (STYLE Y) OPERATION REQUIRES CONNECTION TO A COMPATIBLE SIMPLEX SMARTSYNC NAC OR TO SMARTSYNC CONTROL MODULE (SCM) 4905-9938
- CLASS A (STYLE Z) OPERATION IS SUPPORTED BY USING THE 4905-9938 SCM

SPECIFICATIONS:

- HOUSING DIMENSIONS (INCLUDING LENS) : 5 1/8"H X 5" W X 2 3/4"D
- TEMPERATURE RANGE: 32° F TO 122° F (0° TO 50° C)
- HUMIDITY RANGE: 10% TO 93% NON-CONDENSING AT 100° F (38° C)
- IN/OUT WIRING TERMINALS FOR #18 AWG TO #12 AWG SOLID, ACCESSIBLE FROM FRONT OF HOUSING, PROVIDING EASY ACCESS FOR INSTALLATION, INSPECTION, AND TESTING

STROBE

- RATED VOLTAGE RANGE: 22 TO 29 VDC
- OPERATING VOLTAGE RANGE: 17.6 TO 32 VDC
- FLASH RATE: 1Hz

*CURRENT DRAWS REFLECT STROBE FLASHING AND HORN ON.

MODEL NUMBER	HOUSING COLOR	LETTERING COLOR	STROBE RATING	NOMINAL AVERAGE CURRENT @ 22 VDC	24 VDC	29 VDC
4903-9417	RED	WHITE	15cd	77 mA	67 mA	62 mA
4903-9418	RED	WHITE	75cd	168 mA	154 mA	134 mA
4903-9419	RED	WHITE	110cd	212 mA	211 mA	187 mA
4903-9428	WHITE	RED	15cd	77 mA	67 mA	62 mA
4903-9429	WHITE	RED	75cd	168 mA	154 mA	134 mA
4903-9430	WHITE	RED	110cd	212 mA	211 mA	187 mA

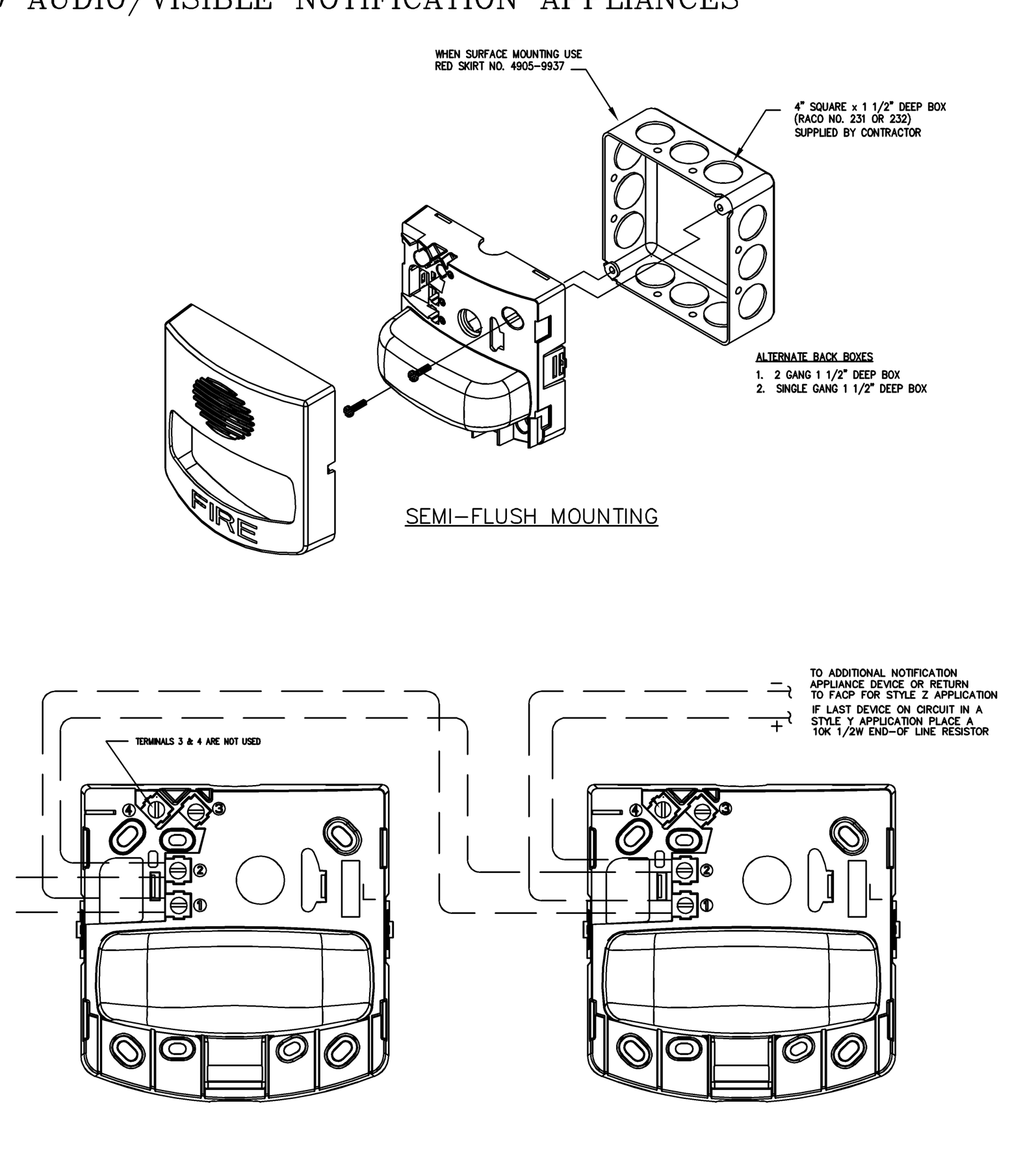
HORN

- RATED VOLTAGE RANGE: 22 TO 29 VDC
- OPERATING VOLTAGE RANGE: 17.6 TO 32 VDC
- SOUND OUTPUT CHARACTERISTICS: 2400 TO 3700 Hz SWEEP, MODULATED AT 120 Hz RATE

HORN SOUND OUTPUT RATINGS @ 10 FT. (3m)

VOLTAGE	22 VDC		24 VDC		29 VDC	
SOUND TYPE *	STEADY	CODED	STEADY	CODED	STEADY	CODED
REVERBERANT CHAMBER UL 464 TEST	84 dBA	79 dBA	85 dBA	80 dBA	86 dBA	81 dBA
ANECHOIC CHAMBER	90 dBA	86 dBA	91 dBA	86 dBA	92 dBA	87 dBA

* CODED VALUES ARE TYPICAL OF THE OUTPUT MEASURED WITH A TEMPORAL CODED OR A MARCH TIME CODED PULSE AND WITH A SOUND LEVEL METER READING ON A "FAST" SETTING. UNDER THE SAME TEST CONDITIONS, CODED HORN OUTPUT "PEAK" SOUND LEVEL READINGS ARE TYPICALLY 4 dBA HIGHER.



QUICKALERT™ SYNCHRONIZED VISIBLE NOTIFICATION APPLIANCES

PRODUCT INFORMATION

FEATURES:

- CLASS B (STYLE Y) OPERATION REQUIRES CONNECTION TO A COMPATIBLE SIMPLEX SMARTSYNC NAC OR TO SMARTSYNC CONTROL MODULE (SCM) 4905-9938
- CLASS A (STYLE Z) OPERATION IS SUPPORTED BY USING THE 4905-9938 SCM

SPECIFICATIONS:

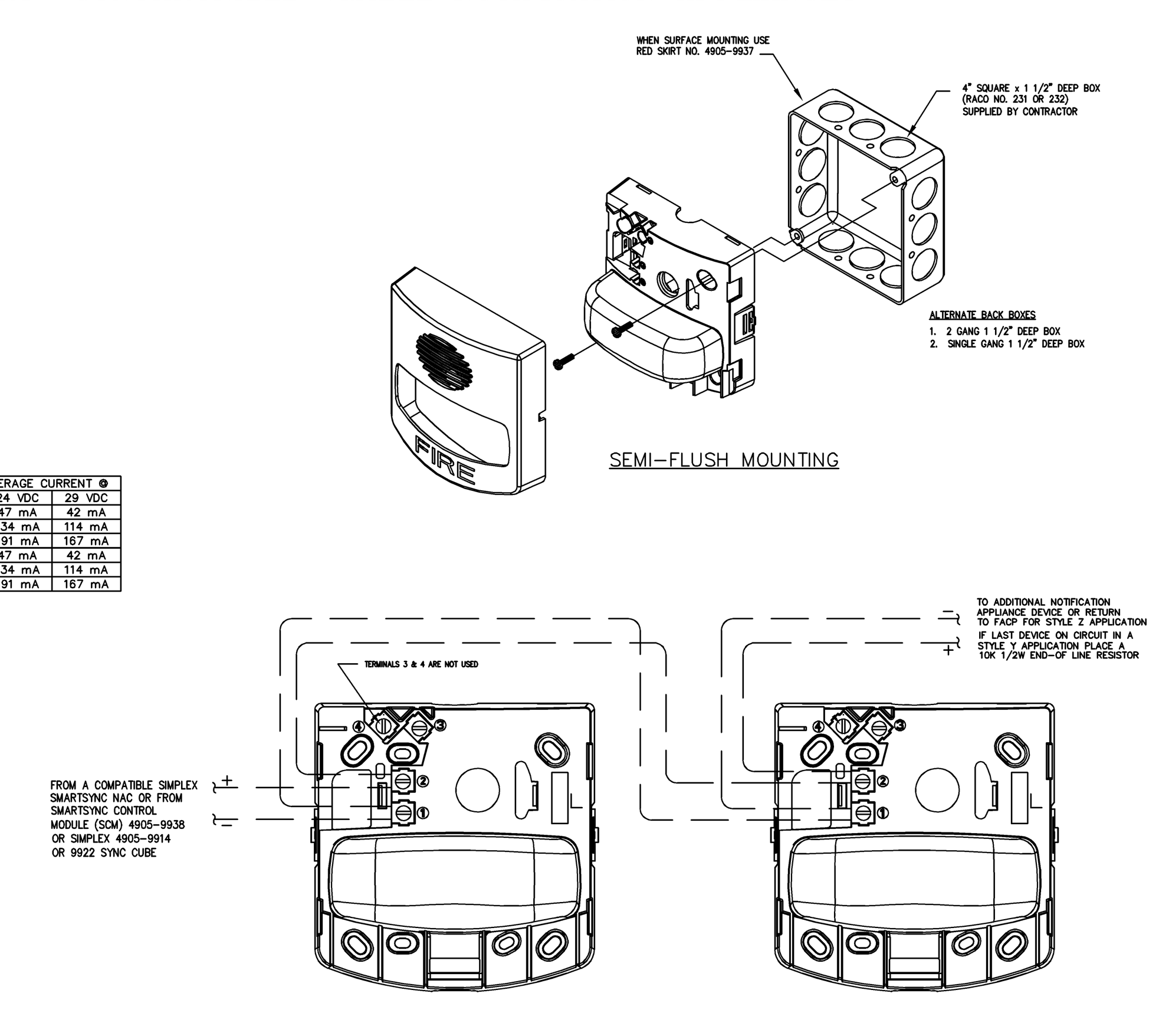
- HOUSING DIMENSIONS (INCLUDING LENS) : 5 1/8"H X 5" W X 2 3/4"D
- TEMPERATURE RANGE: 32° F TO 122° F (0° TO 50° C)
- HUMIDITY RANGE: 10% TO 93% NON-CONDENSING AT 100° F (38° C)
- IN/OUT WIRING TERMINALS FOR #18 AWG TO #12 AWG SOLID, ACCESSIBLE FROM FRONT OF HOUSING, PROVIDING EASY ACCESS FOR INSTALLATION, INSPECTION, AND TESTING

STROBE

- RATED VOLTAGE RANGE: 22 TO 29 VDC
- OPERATING VOLTAGE RANGE: 17.6 TO 32 VDC
- FLASH RATE: 1Hz

*CURRENT DRAWS REFLECT STROBE FLASHING

MODEL NUMBER	HOUSING COLOR	LETTERING COLOR	STROBE RATING	NOMINAL AVERAGE CURRENT @ 22 VDC	24 VDC	29 VDC
4904-9331	RED	WHITE	15cd	55 mA	47 mA	42 mA
4904-9332	RED	WHITE	75cd	148 mA	134 mA	114 mA
4904-9333	RED	WHITE	110cd	192 mA	191 mA	167 mA
4904-9342	WHITE	RED	15cd	55 mA	47 mA	42 mA
4904-9343	WHITE	RED	75cd	148 mA	134 mA	114 mA
4904-9344	WHITE	RED	110cd	192 mA	191 mA	167 mA



Johnson Controls

DISTRICT - 321
24755 HALSTED ROAD
FARMINGTON HILLS, MI 48335
SERVICE: 800-343-9797
PHONE: 248-427-5050
FAX: 248-426-6655

BATTLE CREEK PUBLIC SCHOOLS

DUDLEY ELEMENTARY

DUDLEY ELEMENTARY
308 WEST ROSEVELT AVE
BATTLE CREEK, MI 49037

ISSUE LOG: Revisions shown with # symbol

MARK	DATE	CAD	CHK	DESCRIPTION
2	01/20/23	AB	SP	650302115 - DUCT DETECTOR ADD
1	05/11/00	DCV	-	000157-01 - ISSUED FOR STATE REVIEW

DRAWN BY:	A.BUCK
CHECKED BY:	S.POSTEMA
ISSUE DATE:	1/20/23
JOB #:	321302115
PROJECT #:	321:650302115

SYSTEM: **FIRE ALARM SYSTEM**

SHEET: **TYPICAL DETAILS**

FA-703

FILE PATH: C:\$MY PROJECTS\In Progress\650302115 - BATTLE CREEK DUDLEY HVAC\FA-701 THRU 703.dwg

LAST SAVED BY: JBUCKA

LAST PRINTED: 1/19/2023 10:13:26 AM

30" x 42" - Arch E1 Size