

WEST BERKELEY SENIOR CENTER RENOVATIONS

1900 6th St.
Berkeley, California 94710

INTREPID
ELECTRONIC SYSTEMS INC.
400 Market St.
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6300 San Ignacio Ave
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www.intrepidelectronics.com
CA License C-10 & C-16 739369

SCOPE OF WORK

REPLACE EXISTING FIRE ALARM PANEL WITH NEW ADDRESSABLE AUTOMATIC AND MANUAL SYSTEM CLASS B SYSTEM MONITORED BY CENTRAL STATION. MONITORING IS EXISTING BY CENTRY ALARM.

SHEET SCHEDULE

- FA-00 COVER SHEET
- FA-01 1ST FLOOR PLAN
- FA-02 RISER / DETAILS
- FA-03 PANEL DIAGRAM, CALCULATIONS

DEVICE LEGEND

SYMBOL	DESCRIPTION	MANUFACTURE	MODEL #	CSFM #	QTY
[FAP]	FIRE ALARM CONTROL PANEL/DIALER	NOTIFIER	NFS-320	7165-0028:0243	1
	UDACT	NOTIFIER	UDACT	7300-0028:0174	1
	18AH BATTERY	NOTIFIER	BAT-12180	-	2
Ⓢ	ADDRESSABLE SMOKE DETECTOR	NOTIFIER	FSP-851	7272-0028:0206	18
	DETECTOR BASE	NOTIFIER	B210LP	7300-0028:0173	18
Ⓡ	ADDRESSABLE HEAT DETECTOR 135 DEG.	NOTIFIER	FST-851	7270-0028:0196	1
	DETECTOR BASE	NOTIFIER	B210LP	7300-0028:0173	1
[DSD]	ADDRESSABLE DUCT DETECTOR	NOTIFIER	DNR	3242-1653:0209	4
[P]	ADDRESSABLE MANUAL PULL STATION	NOTIFIER	NBG-12LX	7300-0028:0219	4
[MM]	ADDRESSABLE MONITORING MODULE	NOTIFIER	FMM-1	7300-0028:0219	1
[RM]	ADDRESSABLE RELAY MODULE	NOTIFIER	FRM-1	7125-1653:0188	4
[HWS]	WALL MULTI-CANDELA HORN/STROBE	SYSTEM SENSOR	P2W	7125-1653:0186	17
[HWP]	WEATHER PROOF HORN/STROBE	SYSTEM SENSOR	P2WK	7125-1653:0186	2
[KHS]	KITCHEN HOOD SYSTEM	BY OTHERS	-	-	A
---	SIGNALING LINE CIRCUIT	FPL #16 AWG TWISTED PAIR			B
---	NOTIFICATION CIRCUIT	#12 THHN STRANDED RED AND BLACK			N
---	ANNUNCIATOR	RS-485 FPL #16 TWISTED SHIELDED PAIR			P
---	24VDC	#14 THHN RED AND BLACK			

ALL FIRE ALARM CABLE RUNS SHOWN ON PLANS ARE DIAGRAMATIC.
ALL WIRE TO BE IN CONDUIT

SYSTEM CONFIGURATION

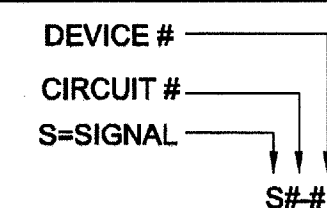
TYPE OF ALARM SYSTEM

(PER NFPA 72, 2010 EDITION)
REMOTE STATION / 24HR STANDBY 5 MIN OF ALARM

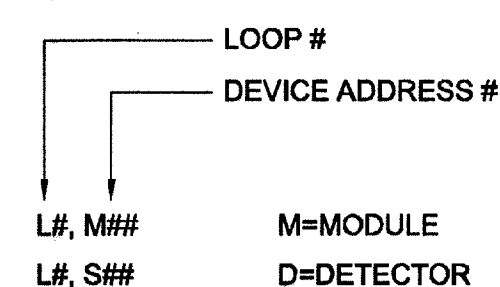
ALARM CIRCUIT CLASSIFICATIONS

(PER NFPA 72, 2010 EDITION)
NAC = STYLE Y (CLASS B) NOTIFICATION APPLIANCE CIRCUIT
SLC = STYLE 4 (CLASS B) SIGNALING LINE CIRCUIT
IDC = STYLE B (CLASS B) INITIATING DEVICE CIRCUIT

NOTIFICATION CIRCUIT LEGEND



ADDRESSABLE DEVICE LEGEND



FIRE ALARM SYSTEM OPERATIONAL MATRIX

FIRE ALARM SYSTEM OPERATIONAL MATRIX

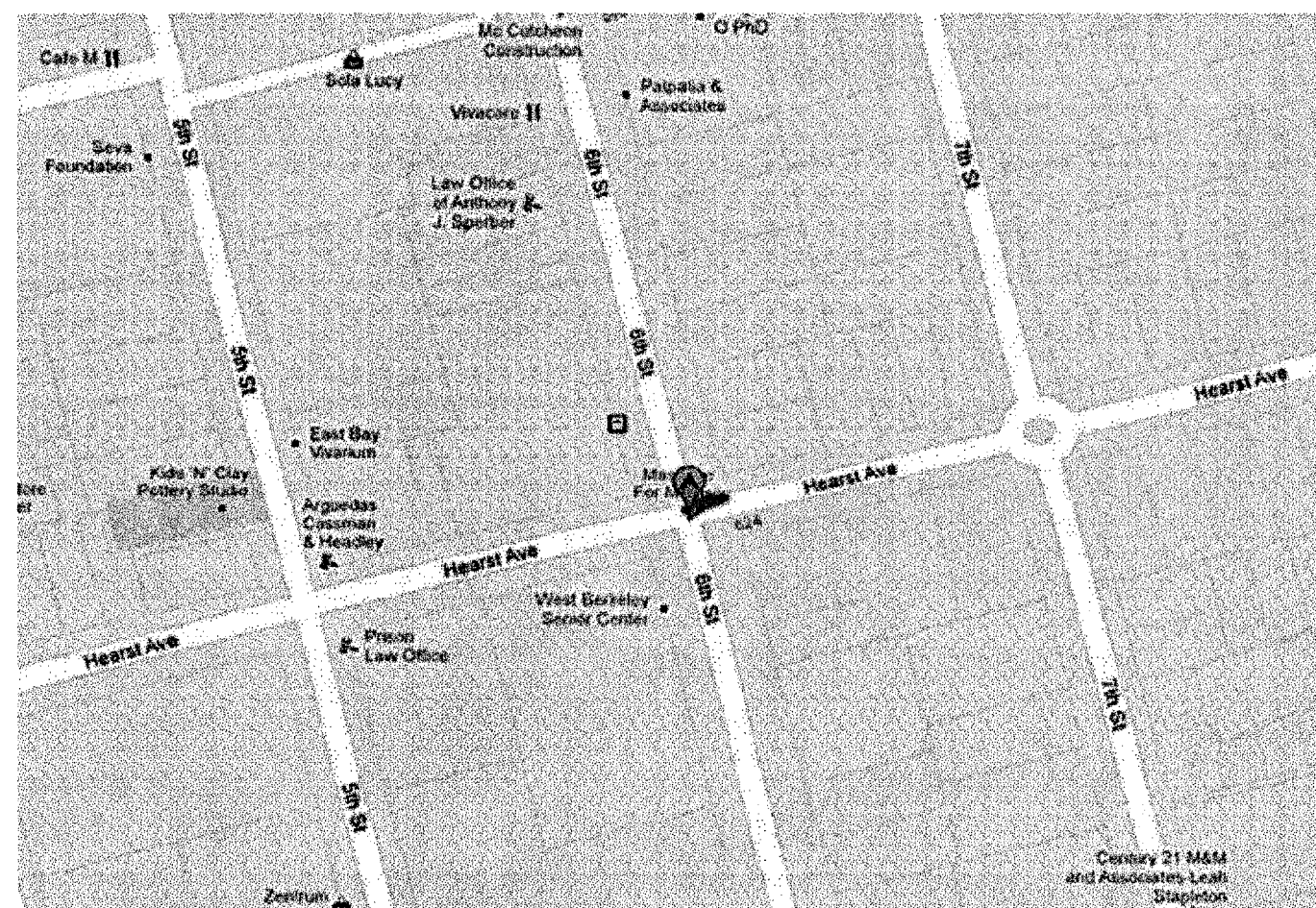
	FAOP ALARM	FAOP TROUBLE	SHUT DOWN ASSOCIATED AHU	ACTIVATE HORN AND STROBE	ALARM SIGNAL TO CENTRAL STATION	SUPERVISORY SIGNAL TO CENTRAL STATION	TROUBLE SIGNAL TO CENTRAL STATION
SMOKE DETECTOR	X			X	X		
HEAT DETECTOR	X			X	X		
MANUAL PULL STATION	X			X	X		
DUCT DETECTOR	X		X	X	X		
OPEN WIRE		X					X
GROUNDING WIRE		XR					X
SHORTED WIRES		X					X
KITCHEN HOOD SYSTEM	X			X	X		

R=ALARM RECEIPT CAPABILITY DURING ABNORMAL CONDITIONS IS REQUIRED

APPLICABLE CODES

- CALIFORNIA BUILDING CODE (CBC) 2010; CALIFORNIA ELECTRIC CODE (CEC) 2010; CALIFORNIA MECHANICAL CODE (CMC) 2010; CALIFORNIA FIRE CODE (CFC) 2010.
- STATE FIRE MARSHAL TITLE 19, PUBLIC SAFETY.
- U.L STANDARDS 864, 9TH EDITION.
- FIRE ALARM SYSTEMS WILL COMPLY WITH THE NATIONAL FIRE ALARM CODE (NFPA STANDARD #72), AS AMENDED BY CHAPTER 35 OF THE CALIFORNIA BUILDING CODE, CALIFORNIA FIRE CODE, AND BERKELEY FIRE CODE- LOCAL ORDINANCES.

SITE MAP



REVISION:	DATE:
△ ASBULT	1/15/12

West Berkeley Senior Center
Renovations

Fire Alarm

PROJECT MANAGER:
LINDA SALAS
CITY OF BERKELEY
ENGINEERING DIVISION
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ELECTRICAL CONTRACTOR:
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JOB NO.:
12-0068

DRAWN BY: JAR DATE: 10/12/12

ENG. APPROVAL: NC DATE: 10/12/12

PM APPROVAL: DATE:

SCALE:

COVER SHEET

SHEET NO.:

FA.00

<input type="checkbox"/>	ACCESS CONTROL SYSTEM
<input type="checkbox"/>	CCTV SURVEILLANCE SYSTEM
<input checked="" type="checkbox"/>	FIRE ALARM LIFE SAFETY
<input type="checkbox"/>	NURSE CALL SYSTEM
<input type="checkbox"/>	SECURITY SYSTEM
<input type="checkbox"/>	SOUND SYSTEM
REVISION:	DATE:
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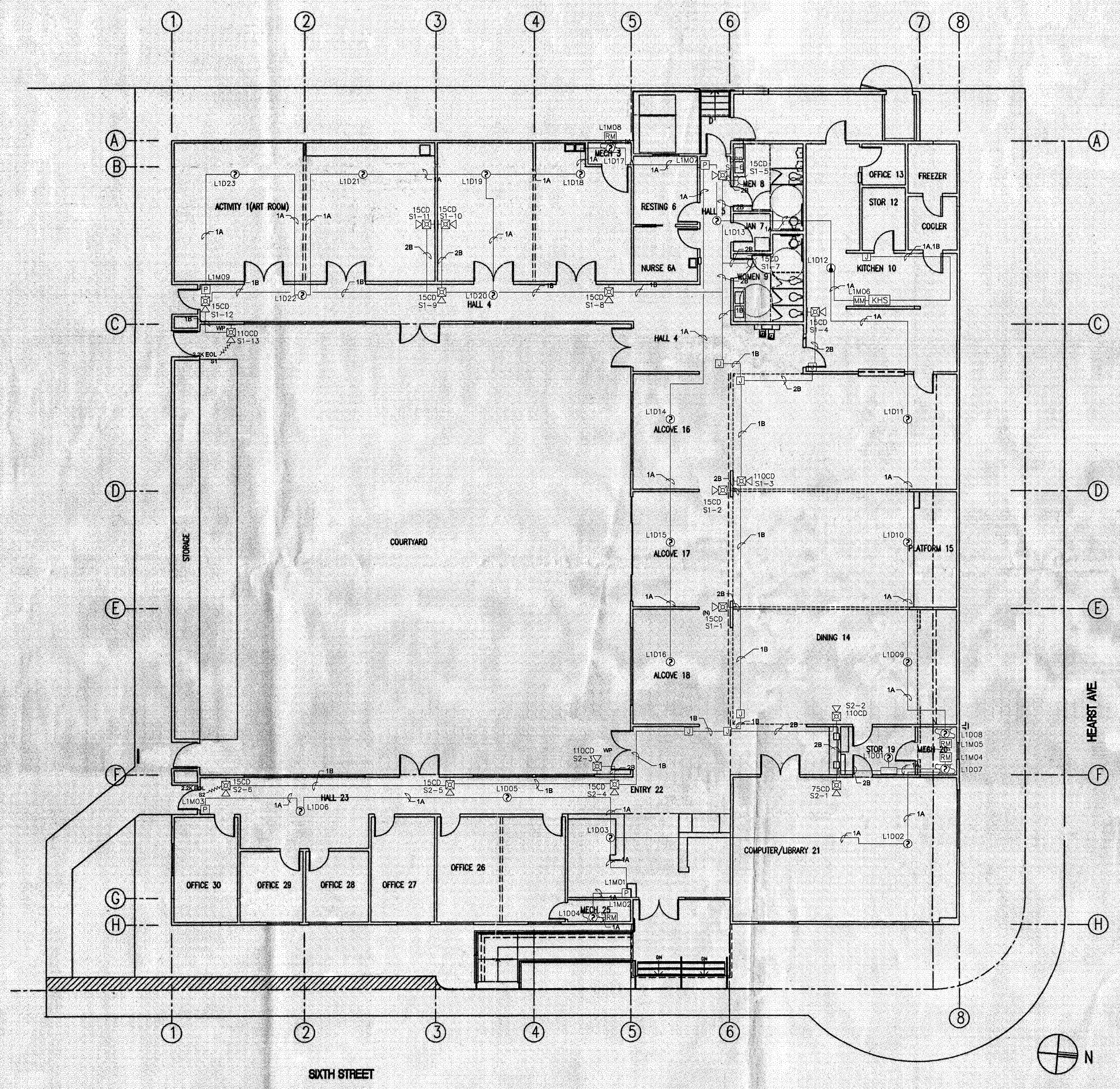
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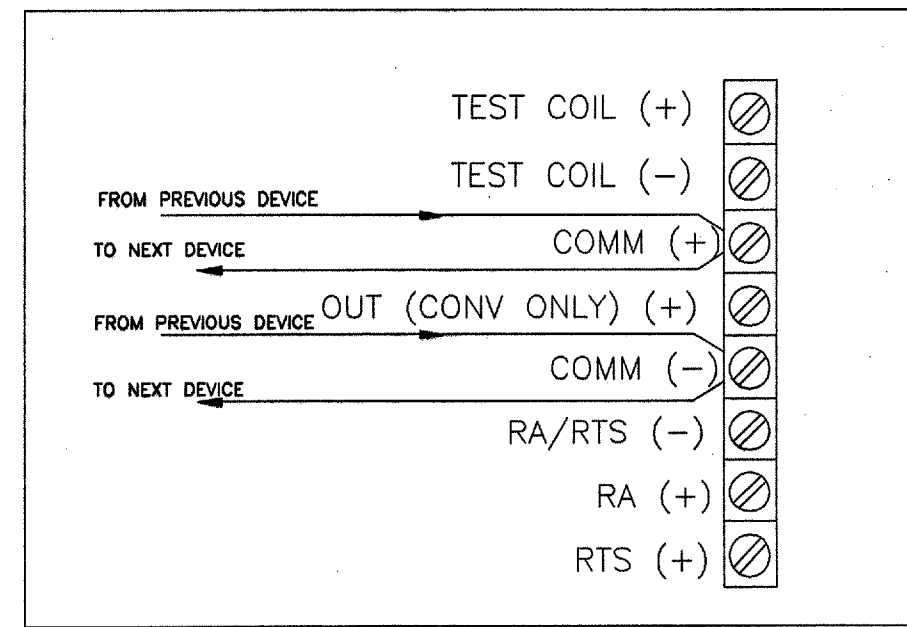
JOB NO.:	12-0068		
DRAWN BY:	JAR	DATE:	10/12/12
ENG. APPROVAL:	NC	DATE:	10/12/12
PM APPROVAL:		DATE:	

SCALE:
FIRST FLOOR

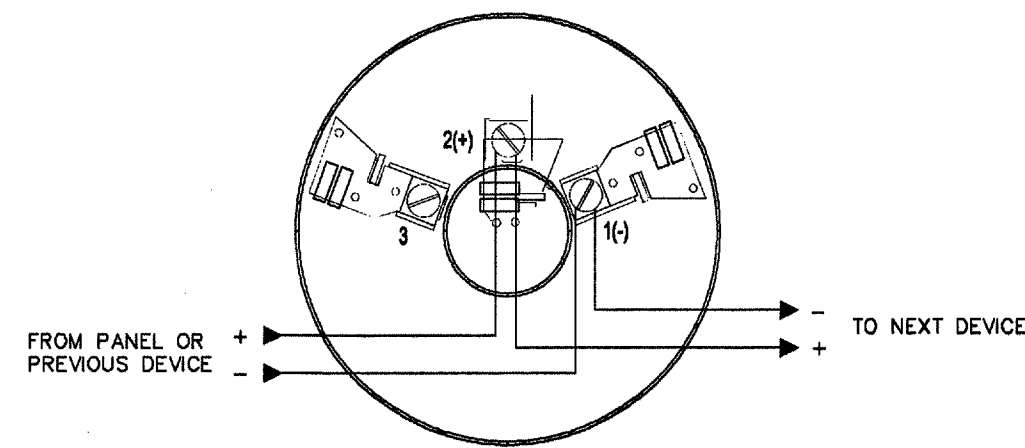
SHEET NO.:

FA.01



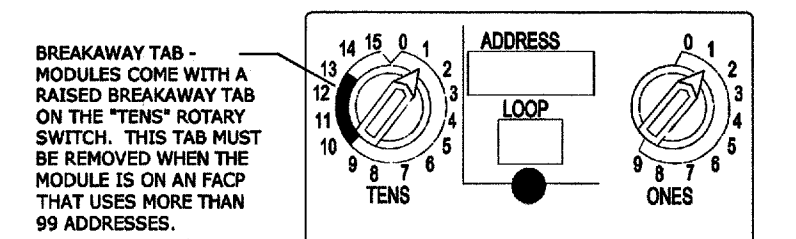


1 DNR DUCT SMOKE DETECTOR HOUSING
SCALE: NTS



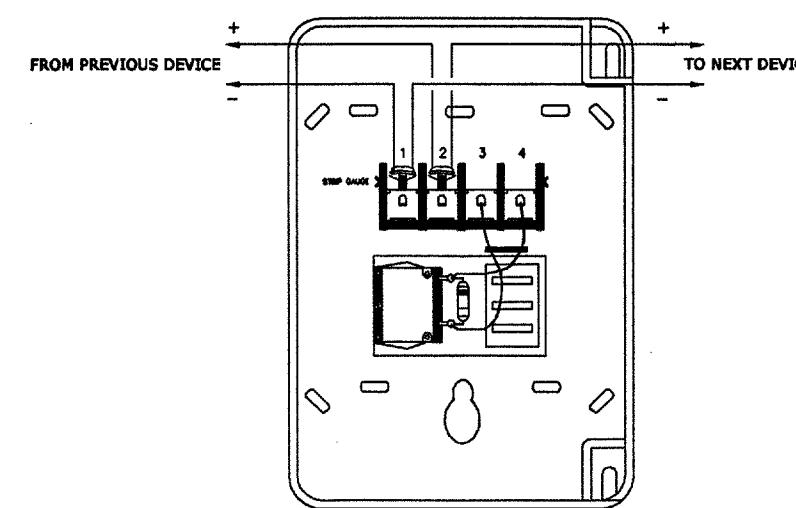
MOUNTING INSTRUCTIONS:
MOUNT BASE ON BOX WHICH IS AT LEAST 1.5" DEEP. SUITABLE BOXES INCLUDE 4" SQUARE, 3-1/2" OR 4" OCTAGONAL BOX. SINGLE GANG BOX (EXCEPT RELAY OR ISOLATOR BASE).

2 ADDRESSABLE SMOKE /HEAT DETECTOR BASE
SCALE: NTS



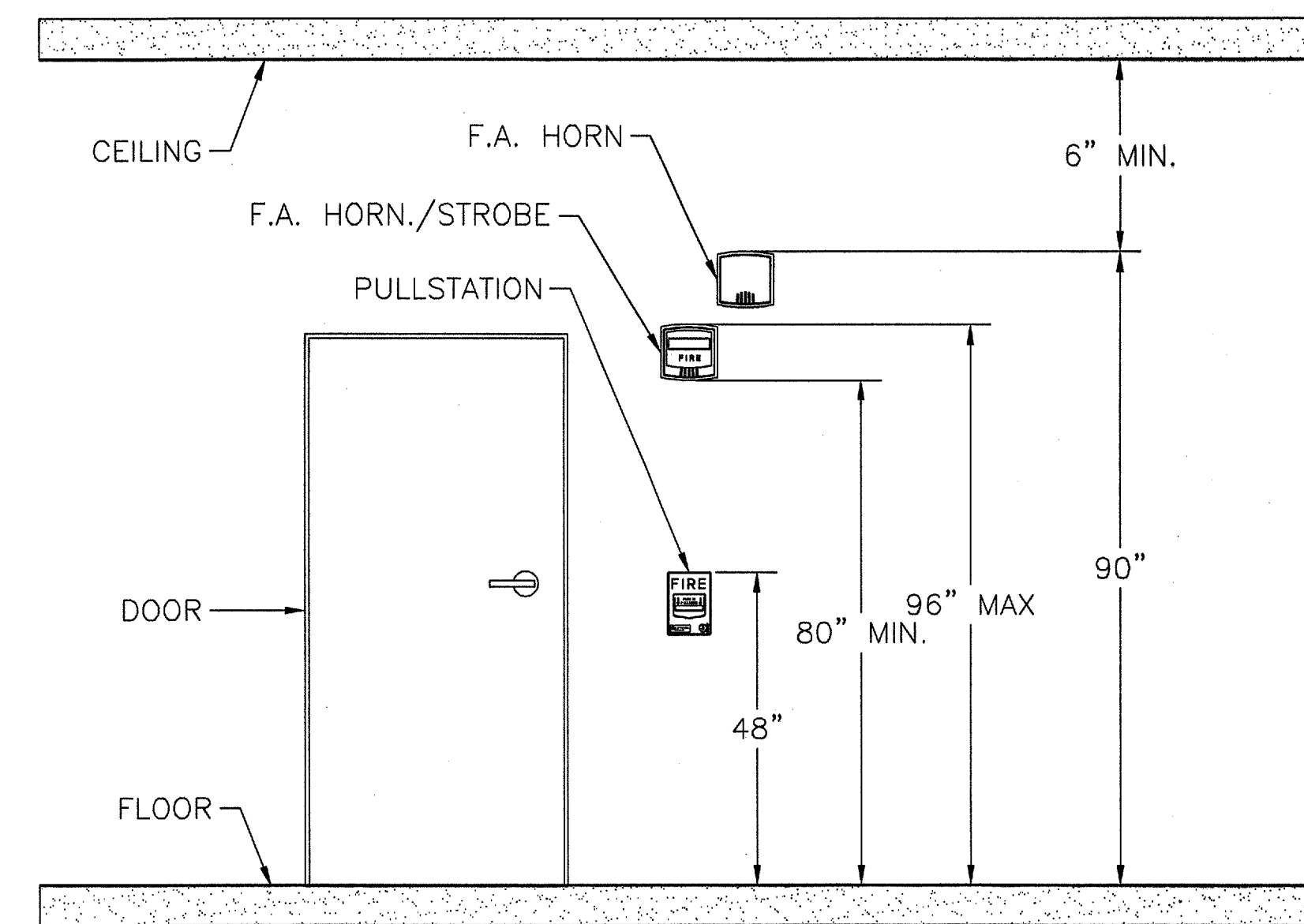
NOTES:
EACH MODULE CAN BE SET TO ONE OF 159 ADDRESSES (01-159) AND IS FACTORY PRESET WITH AN ADDRESS OF "00".
TO SET AN SLC ADDRESS, USE A COMMON SCREWDRIVER TO ADJUST THE ROTARY SWITCHES ON THE MODULE TO THE DESIRED ADDRESS. WHEN FINISHED, MARK THE ADDRESS ON THE MODULE FACE IN THE PLACE PROVIDED.

ROTARY SWITCHES FOR ADDRESSABLE MODULES

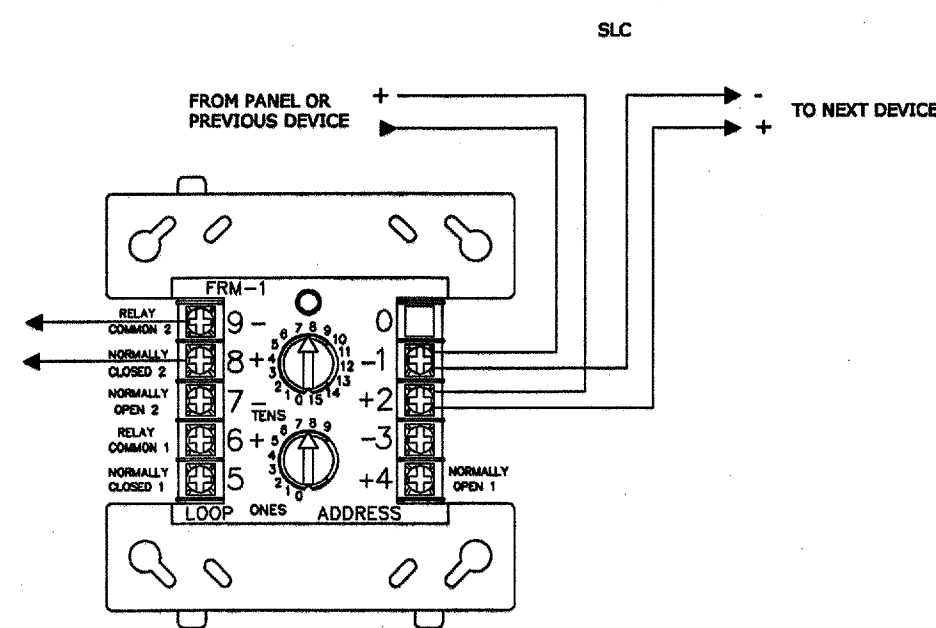


MOUNTING INSTRUCTIONS:
MOUNTS TO A STANDARD SINGLE-GANG (2.125" MIN. DEPTH), DOUBLE-GANG, OR 4" SQUARE ELECTRICAL BOX.

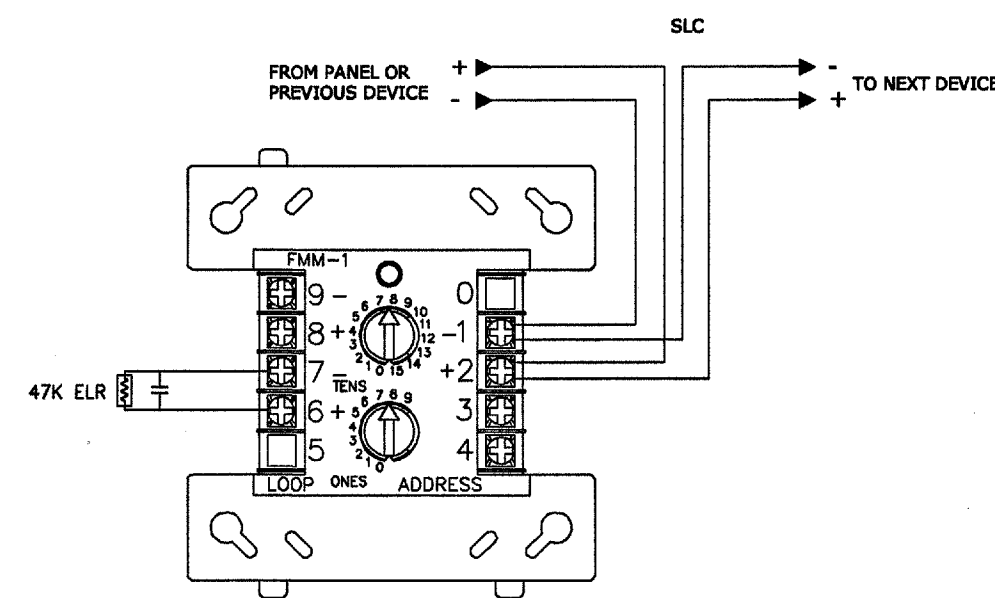
3 ADDRESSABLE MANUAL PULL STATION
SCALE: NTS



4 FA DETAIL ELEVATION
SCALE: NTS

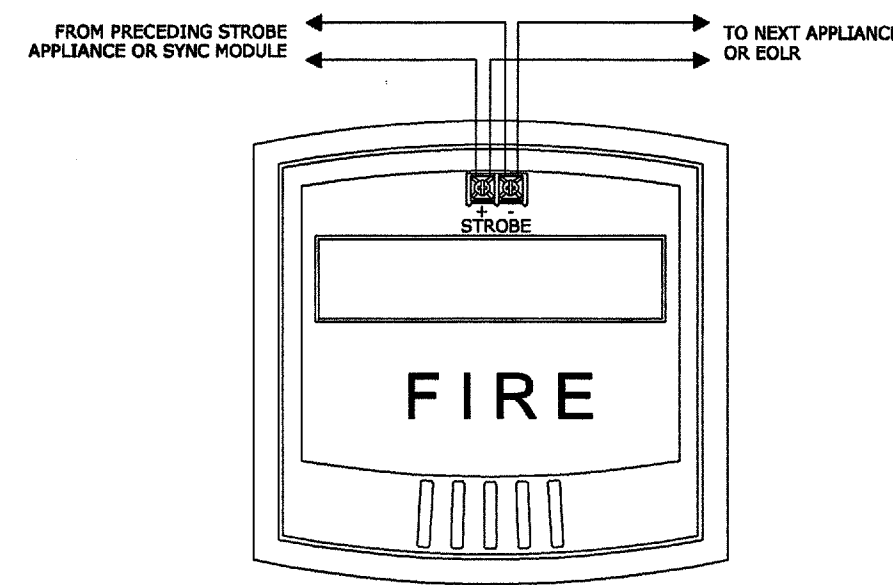


5 TYPICAL FRM-1 ADDRESSABLE RELAY MODULE
SCALE: NTS

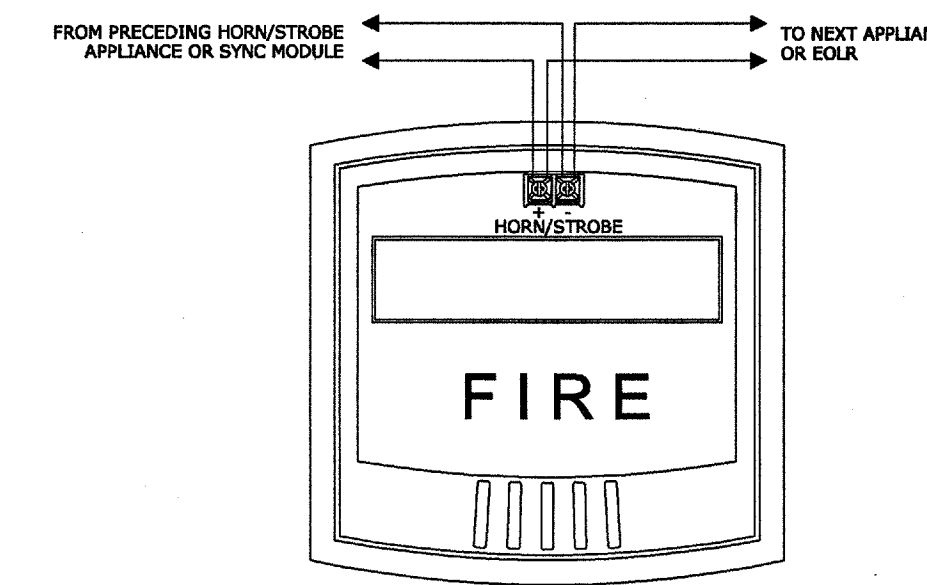


MOUNTING INSTRUCTIONS: MOUNTS TO A 4" SQUARE X 2.125" DEEP BOX

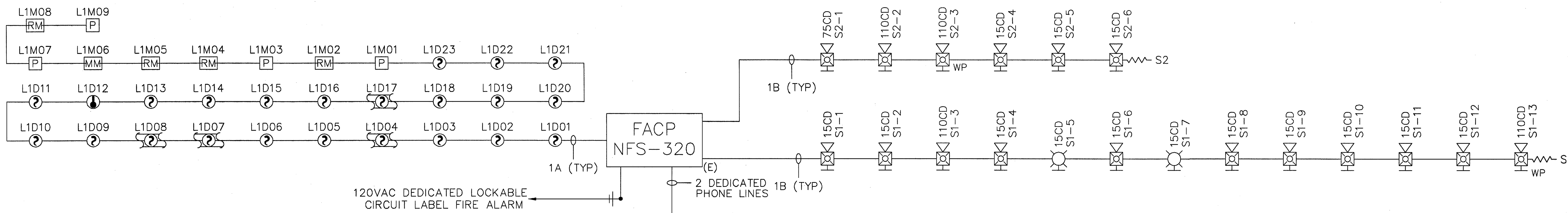
6 FMM-1 ADDRESSABLE MONITOR MODULE
SCALE: NTS



7 TYPICAL STROBE
SCALE: NTS



8 TYPICAL HORN / STROBE
SCALE: NTS



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CCTV SURVEILLANCE SYSTEM
<input checked="" type="checkbox"/> FIRE ALARM LIFE SAFETY
NURSE CALL SYSTEM
SECURITY SYSTEM
SOUND SYSTEM
REVISION: DATE:
<input checked="" type="checkbox"/> ASBUILT 1/15/12

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DRAWN BY:	JAR
ENG. APPROVAL:	NC
PM APPROVAL:	
DATE:	10/12/12
DATE:	10/12/12

RISER /
DETAILS

SHEET NO.:

FA.02

<input type="checkbox"/>	ADDRESS CONTROL SYSTEM
<input type="checkbox"/>	CCTV SURVEILLANCE SYSTEM
<input checked="" type="checkbox"/>	FIRE ALARM LIFE SAFETY
<input type="checkbox"/>	NURSE CALL SYSTEM
<input type="checkbox"/>	SECURITY SYSTEM
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REVISION: DATE:	
<input checked="" type="checkbox"/>	ASBUILT 1/15/12

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PM APPROVAL: DATE:

SCALE:

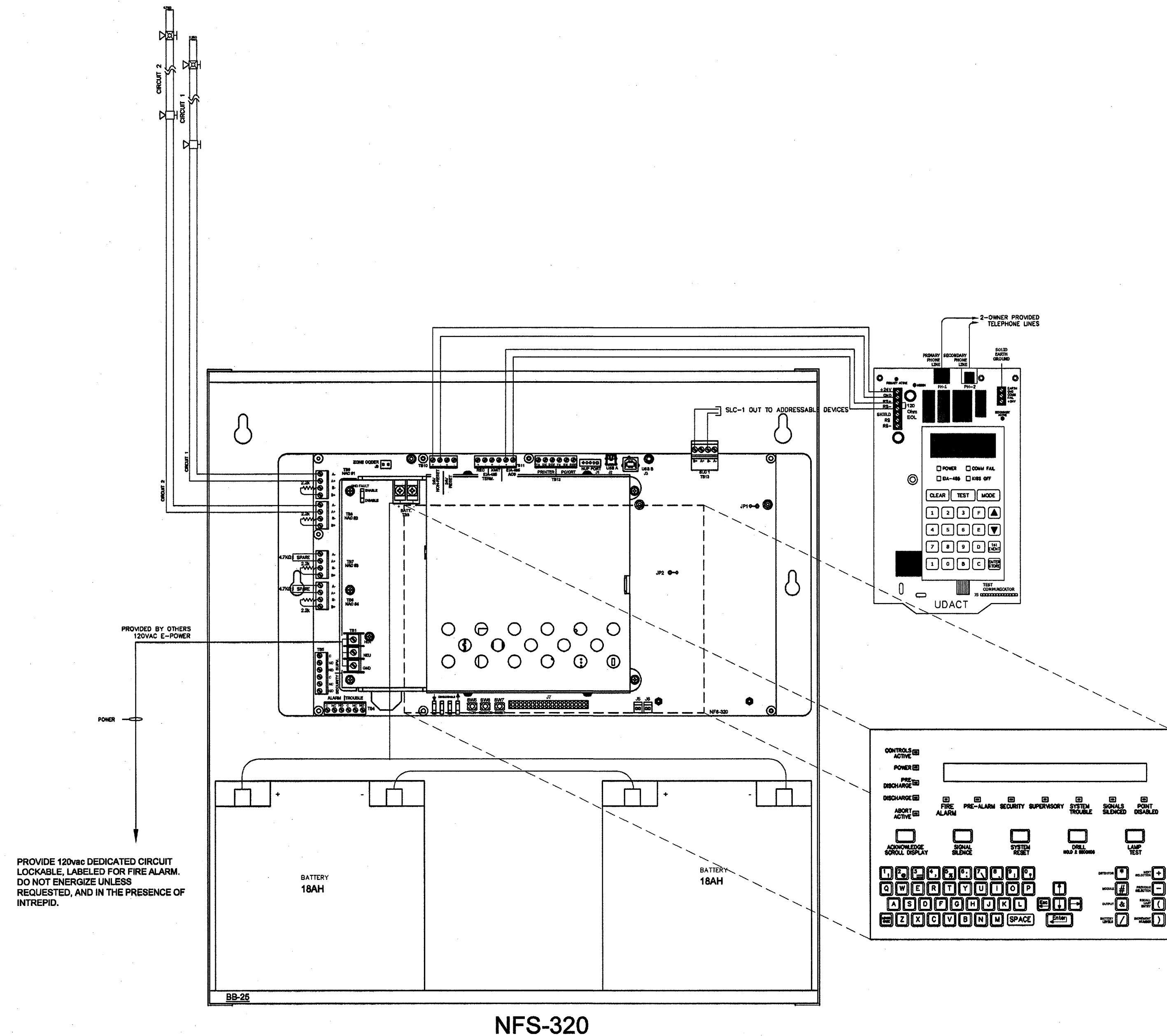
PANEL DETAIL/
CALC'S

SHEET No.:

FA.03

BATTERY CALCULATIONS					
FOR: West Berkeley Senior Center Renovations		PROJECT: 12-0068 Panel Number: NFS-320			
DESIGN PARAMETERS: Standby Hours - 24 Alarm Minutes - 5					
Qty	Description	STANDBY CURRENT		ALARM CURRENT	
		EACH	TOTAL	Qty	TOTAL
CONTROL PANEL					
1	CPU-320	x 0.250	= 0.25	1	x 0.250 = 0.25
1	UDACT	x 0.040	= 0.04	1	x 0.100 = 0.1
				Sub-Total	a 0.35
INITIATING DEVICES					
18	FSP-851 SMOKE DETECTOR	x 0.000360	= 0.00648	18	x 0.006500 = 0.117
4	DNR DACT DETECTORS W RELAY	x 0.000615	= 0.00246	4	x 0.013000 = 0.052
1	FST-851 HEAT DETECTOR	x 0.000300	= 0.0003	1	x 0.000650 = 0.00065
4	NBG-12LX PULL STATION	x 0.000300	= 0.0012	4	x 0.000375 = 0.0015
1	FRM-1 MONITOR MODULE	x 0.000375	= 0.000375	1	x 0.005100 = 0.0051
4	FRM-1 RELAY CONTROL MODULE	x 0.000255	= 0.00102	4	x 0.006500 = 0.026
				Sub-Total	b 0.20225
NOTIFICATION APPLIANCES					
2	STROBE SCW (15 CANDELA)	x	= 0.0000	2	x 0.066 = 0.132
12	HORN/STROBE P2W (15 CANDELA)	x	= 0.0000	12	x 0.079 = 0.948
1	HORN/STROBE P2W (75 CANDELA)	x	= 0.0000	1	x 0.176 = 0.176
4	HORN/STROBE P2W (110 CANDELA)	x	= 0.0000	4	x 0.194 = 0.776
				Sub-Total	d 4.376
Total Standby Current		0.301835			
Standby Hours		x 24			
Standby AH Required		= 7.24404			
Total Panel Component Alarm Current				a	0.35
Total Initiating Devices				b	0.20225
Total Output Device Alarm Current				c	0
Total Indicating Appliance Alarm Current				d	4.376
Total Miscellaneous Device Alarm Current				e	0
Total Alarm Current					4.92825
Alarm Hours(5 min. + 60 min.)		x 0.08333333			
Alarm AH Required		= 0.4106875		0.4106875	
Standby AH Required		+ 7.24404			
Total Current Needs		= 7.6547275			
Derate by 20%		x 1.2			
Battery Size Required		= 9.185673		Amp Hours	
INTREPID will provide (a minimum of) two: 18 Amp Hour Batteries @ NFS-320					

Voltage Drop Calculations															
VOLTAGE DROP FOR A GIVEN LENGTH OF CONDUCTOR = 1x FEET X 21.8/ C.M															
WHERE: I = AMPERES PER TERMINAL OF LOAD															
FEET = ONE WAY DISTANCE IN FEET MEASURED FROM SOURCE OF SUPPLY TO LOAD															
21.8 = CONSTANT (RESISTANCE OF CONDUCTOR @ 10.8 OHMS L.M. FOR TWICE THE LENGTH															
C.M. = CROSS SECTION AREA IS RECTANGULAR MLS (SEE CHART BELOW)															
WIRE SIZE (AWG)	14	16	18	20											
CIRCULAR MLS (C.M.)	4110	2590	1620	1020											
SYSTEM SENSOR															
Circuit Number	Circuit Description	STROBE ONLY			HORN/STROBES			Total Dev.	Distance e / feet	Wire amp	Volts at dropped	Volts at End	% Volt Drop		
		150d	300d	750d	1100d	150d	300d							750d	1100d
S1	Circuit 1	2	0.079	0.107	0.176	0.212	0.079	0.107	0.176	1.293	260	6630	1.112	22.588	4.63%
S2	Circuit 2					3		1	2	0.837	150	6630	0.415	23.585	1.73%



PROVIDE 120vac DEDICATED CIRCUIT LOCKABLE, LABELED FOR FIRE ALARM. DO NOT ENERGIZE UNLESS REQUESTED, AND IN THE PRESENCE OF INTREPID.