

1" = 40'-0"
1" = 30'-0"
1" = 20'-0"
1" = 1'-0"
1/8" = 1'-0"
1/4" = 1'-0"

(N) FACP 'B' BATTERY CALCULATIONS

QUANTITY	DEVICE/MODEL	SUPV. CURRENT	TOTAL SUPV. CURRENT	ALARM CURRENT	TOTAL ALARM CURRENT	ADD. NOTES
1	FACP	0.1660	0.1660	6.0000	6.0000	
0	EXISTING LOAD	0.8660	0.0000	0.0385	0.0000	
2	SMOKE & HEAT DETECTOR, MODULES	0.0070	0.0140	0.0004	0.0008	
0	BEAM SMOKE DETECTORS	0.0280	0.0000	0.0385	0.0000	
0	V15	0.0000	0.0000	0.0600	0.0000	
0	V30	0.0000	0.0000	0.0920	0.0000	
0	V75	0.0000	0.0000	0.1650	0.0000	
0	V110	0.0000	0.0000	0.2200	0.0000	
0	AV15	0.0000	0.0000	0.0740	0.0000	
0	AV30	0.0000	0.0000	0.1070	0.0000	
0	AV75	0.0000	0.0000	0.1840	0.0000	
0	AV110	0.0000	0.0000	0.2440	0.0000	
0	WP	0.0000	0.0000	0.0610	0.0000	
TOTALS			0.1800	6.0008	6.0008	
SUPV. CURRENT X 24 HRS			4.3200			
ALARM CURRENT X 5 MINUTES			0.5001			
TOTAL BATTERY STANDBY			4.8201			
USE TWO 7AH 12 VDC BATTERIES						

(N) FACP 'P' BATTERY CALCULATIONS

QUANTITY	DEVICE/MODEL	SUPV. CURRENT	TOTAL SUPV. CURRENT	ALARM CURRENT	TOTAL ALARM CURRENT	ADD. NOTES
1	FACP	0.1660	0.1660	6.0000	6.0000	
0	SCE	0.1660	0.0000	3.0000	0.0000	
52	SMOKE & HEAT DETECTOR, MODULES	0.0070	0.3640	0.0004	0.0208	
0	FUTURE LOAD	0.3920	0.0000	1.3714	0.0000	
0	V15	0.0000	0.0000	0.0600	0.0000	
0	V30	0.0000	0.0000	0.0920	0.0000	
0	V75	0.0000	0.0000	0.1650	0.0000	
0	V110	0.0000	0.0000	0.2200	0.0000	
0	AV15	0.0000	0.0000	0.0740	0.0000	
0	AV30	0.0000	0.0000	0.1070	0.0000	
8	AV75	0.0000	0.0000	0.1840	0.0000	
8	AV110	0.0000	0.0000	0.2440	0.0000	
6	WP	0.0000	0.0000	0.0610	0.3660	
TOTALS			0.5300	7.9708	7.9708	
SUPV. CURRENT X 24 HRS			12.7200			
ALARM CURRENT X 5 MINUTES			0.6642			
TOTAL BATTERY STANDBY			13.3842			
USE TWO 24AH 12 VDC BATTERIES						

CALIFORNIA CODE OF REGULATIONS (C.C.R.)

PART 1	2007 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, TITLE 24 C.C.R.
PART 2	2007 CALIFORNIA BUILDING CODE, TITLE 24 C.C.R. (2006 INTERNATIONAL BUILDING CODE VOLUMES 1-3 OF THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS AND 2007 CALIFORNIA AMENDMENTS)
PART 3	2007 CALIFORNIA ELECTRICAL CODE, TITLE 24 C.C.R. (2006 NATIONAL ELECTRIC CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION, NFPA AND 2007 CALIFORNIA AMENDMENTS)
PART 4	2007 CALIFORNIA MECHANICAL CODE, TITLE 24 C.C.R. (2006 UNIFORM MECHANICAL CODE OF THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS, IAPMO AND 2007 CALIFORNIA AMENDMENTS)
PART 5	2007 CALIFORNIA PLUMBING CODE, TITLE 24 C.C.R. (2006 UNIFORM PLUMBING CODE OF THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS, IAPMO AND 2007 CALIFORNIA AMENDMENTS)
PART 6	2008 CALIFORNIA ENERGY CODE, TITLE 24 C.C.R.
PART 7	2007 CALIFORNIA ELEVATOR SAFETY CONSTRUCTION CODE, TITLE 24 C.C.R.
PART 8	2007 CALIFORNIA HISTORICAL BUILDING CODE, TITLE 24 C.C.R.
PART 9	2007 CALIFORNIA FIRE CODE (2006 INTERNATIONAL FIRE CODE AND CALIFORNIA AMENDMENTS)
PART 10	2007 CALIFORNIA REFERENCE STANDARDS CODE, TITLE 24 C.C.R.
PART 12	TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

FIRE ALARM SYMBOL LIST

SYMBOL	DEVICE TYPE	MANUFACTURER/ MODEL NUMBER	CSFM LISTING NUMBER
⏏	FACP	HOCHIKI #FN-4127N	7170-0410:159
☉	SMOKE DETECTOR DETECTOR BASE	HOCHIKI #ALG-V HOCHIKI #YBN-NSA-4	7272-0410:149 7300-0410:132
⊕	190°F FIXED HEAT DETECTOR	HOCHIKI #DCD-190	7270-0410:151
Ⓜ	MONITOR MODULE	HOCHIKI #CZM	7300-0410:150
Ⓜ	CONTROL MODULE	HOCHIKI #DCP-SOM	7300-0410:150
Ⓜ	HORN/STROBE COMBINATION	WHEELLOCK #NS-MCW-FR	7125-0785:142
Ⓜ WP	WEATHERPROOF HORN	WHEELLOCK #MT24-R	7135-0785:118
Ⓜ	END OF LINE RESISTOR 3.9Kohm	VARIOUS	N/A

NOTES:
1. PROVIDE 16"x16" ACCESS PANEL(S) BENEATH ALL ATTIC HEAT DETECTOR LOCATIONS AT HARD CEILING.
2. PROVIDE MONITOR MODULE AT EACH 190°F FIXED HEAT DETECTOR.

SIGNALING CIRCUIT VOLTAGE DROP CALCULATIONS

CIRCUIT # S2

DEVICE LABEL	AV75	WP	AV15	AV15	AV15	AV15	AV75	WP	WP	WP
1	1	2	3	4	5	6	7	8	9	10
WIRE GAGE	12	12	12	12	12	12	12	12	12	12
DISTANCE IN FEET	67.205	23.993	62.807	36.087	0.500	25.096	70.986	0.500	24.493	39.695
AMPS AT DEVICE	0.184	0.061	0.074	0.074	0.074	0.074	0.184	0.061	0.061	0.061
RUNNING AMPS	0.908	0.724	0.663	0.589	0.515	0.441	0.367	0.183	0.122	0.061
VOLTAGE DROP	0.224	0.064	0.153	0.078	0.001	0.041	0.096	0.000	0.011	0.009

FORMULA = (I X FEET X 24) / CIRC. MILS.

WIRE SIZE	/M. FT.	CIRC. MILS.
10,000	1.018	10380
12,000	1.590	6530
14,000	2.520	4110
16,000	4.020	2580
18,000	6.390	1620
20,000	10.100	1020
22,000	16.200	640
24,000	25.700	404

% VOLTAGE DROP = 2.82 %
TOTAL DISTANCE = 351.36 FT
TOTAL VOLTAGE DROP = 0.68 VOLTS
CIRCUIT VOLTAGE = 24 VOLTS

SIGNALING CIRCUIT VOLTAGE DROP CALCULATIONS

CIRCUIT # S1

DEVICE LABEL	AV75	WP	AV75	WP	AV75	AV75
1	1	2	3	4	5	6
WIRE GAGE	12	12	12	12	12	12
DISTANCE IN FEET	54.195	91.425	77.377	48.071	0.500	91.925
AMPS AT DEVICE	0.184	0.184	0.061	0.184	0.061	0.184
RUNNING AMPS	1.042	0.858	0.674	0.613	0.429	0.368
VOLTAGE DROP	0.208	0.288	0.192	0.108	0.001	0.124

FORMULA = (I X FEET X 24) / CIRC. MILS.

WIRE SIZE	/M. FT.	CIRC. MILS.
10,000	1.018	10380
12,000	1.590	6530
14,000	2.520	4110
16,000	4.020	2580
18,000	6.390	1620
20,000	10.100	1020
22,000	16.200	640
24,000	25.700	404

% VOLTAGE DROP = 4.09 %
TOTAL DISTANCE = 454.92 FT
TOTAL VOLTAGE DROP = 0.98 VOLTS
CIRCUIT VOLTAGE = 24 VOLTS

PARTIAL LIST OF APPLICABLE STANDARDS

2007 CALIFORNIA BUILDING CODE (FOR SFM) NATIONAL STANDARDS SECTION 3504.1.3		
NFPA 13	AUTOMATIC SPRINKLER SYSTEMS	2002 EDITION
NFPA 14	STANDPIPE SYSTEMS	2002 EDITION
NFPA 17	DRY CHEMICAL EXTINGUISHING SYSTEMS	2002 EDITION
NFPA 17a	WET CHEMICAL EXTINGUISHING SYSTEMS	2002 EDITION
NFPA 20	STATIONARY PUMPS	2003 EDITION
NFPA 24	PRIVATE FIRE MAINS	2002 EDITION
NFPA 72	NATIONAL FIRE ALARM CODE (CALIF. AMENDED) (NOTE SEE UL STANDARD 1971 FOR VISUAL DEVICES)	2002 EDITION
NFPA 253	CRITICAL RADIANT FLUX OF FLOOR COVERING SYSTEMS	2006 EDITION
NFPA 2001	CLEAN AGENT FIRE EXTINGUISHING SYSTEMS	2004 EDITION
ASME 17.1	ELEVATOR STANDARDS	2004 EDITION

REFERENCE CODE SECTION FOR NFPA STANDARDS - CBC (SFM) 3504.1

FIRE ALARM SYSTEM NOTES

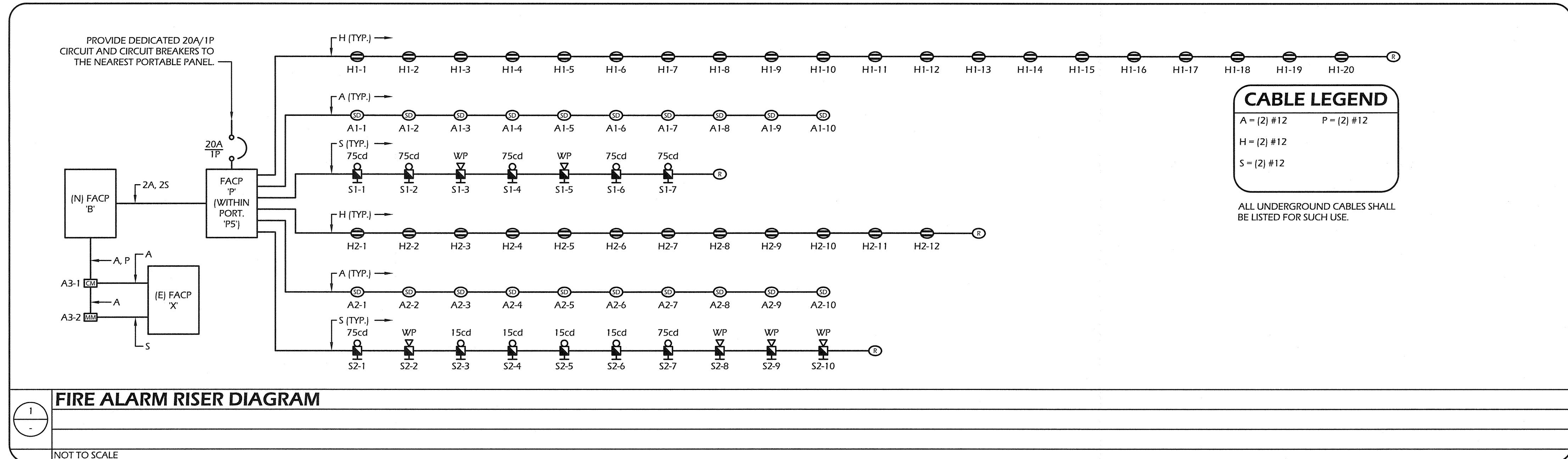
- ALL WORK AND MATERIALS SHALL COMPLY WITH THE LATEST REGULATIONS OF THE STATE FIRE MARSHALL, CALIFORNIA CODE OF REGULATIONS, SERVING UTILITY COMPANIES AND OTHER APPLICABLE STATE ORDINANCES. NOTHING IN THESE PLANS OR SPECIFICATIONS IS TO BE CONSTRUED AS TO PERMIT WORK NOT CONFORMING TO THESE CODES, WHERE WORK OF A HIGHER DEGREE IS INDICATED IN THE PLANS OR SPECIFICATIONS THIS REQUIREMENT SHALL GOVERN.
- THE FIRE ALARM SYSTEM DESIGN IS A "COMPLETE PLAN SUBMITTAL". THE CONTRACTOR SHALL INSTALL THE SYSTEM AS SHOWN AND AS HEREIN SPECIFIED.
- ALARM INDICATING DEVICES OF A FIRE ALARM SYSTEM INTENDED TO ALERT ALL OCCUPANTS SHALL BE SO LOCATED AND UNOBSTRUCTED AS TO CAUSE A LEVEL OF AUDIBILITY OF NOT LESS THAN 15 DB ABOVE AMBIENT NOISE LEVELS MEASURED FOUR FEET ABOVE THE FLOOR INSIDE BUILDING. AMBIENT NOISE LEVELS SHALL BE CONSTRUED TO MEAN THAT WHICH CAN NORMALLY BE EXPECTED TO EXIST WHEN THE FACILITY, BUILDING, ROOM OR AREA IS FUNCTIONING UNDER NORMAL OPERATIVE OR WORKING CONDITIONS.
- UPON COMPLETION OF THE INSTALLATION OF THE FIRE PROTECTIVE SIGNALING EQUIPMENT, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE ENFORCING FIRE AGENCY PER CHAPTER 7, NFPA 72, AND A CERTIFICATE OF COMPLETION SHALL BE PROVIDED TO THE OWNER PER CHAPTER 1, NFPA 72 AND THE CALIFORNIA FIRE CODE, SECTION 1007.3.4.
- AUDIBLE DEVICES SHALL HAVE TEMPORAL CODE 3 SOUND PATTERN.
- ALL AUDIBLE AND VISUAL DEVICES SHALL BE SYNCHRONIZED.
- ALL FIRE PROTECTION SIGNALING COMPONENTS SHALL BE ONLY THOSE APPROVED AND LISTED IN THE STATE FIRE MARSHAL'S LISTING SERVICE. AN ITEMIZED MATERIALS LIST SHOWING MAKE, MODEL NUMBER AND ITS CORRESPONDING STATE FIRE MARSHAL'S LISTING NUMBER SHALL BE FURNISHED TO THE PROJECT INSPECTOR. UPON COMPLETION OF THE INSTALLATION OF THE FIRE PROTECTIVE SIGNALING EQUIPMENT, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE LOCAL FIRE AUTHORITY WITH I.O.R. INSTALLATION REQUIREMENTS SHALL BE PER U.F.C., ARTICLE 10, SECTION 1001.

SCOPE OF FIRE ALARM WORK

THE FIRE ALARM SYSTEM CONSISTS OF INTERCONNECTING THE NEW FIRE ALARM SYSTEM WITH THE EXISTING MAIN FIRE ALARM CONTROL PANEL. AUDIBLE/VISUAL DEVICES ARE USED FOR NOTIFICATION. ALL PERMANENT PORTABLES WILL HAVE AN AUTOMATIC AND ADDRESSABLE SYSTEM.

SYSTEM DESCRIPTION

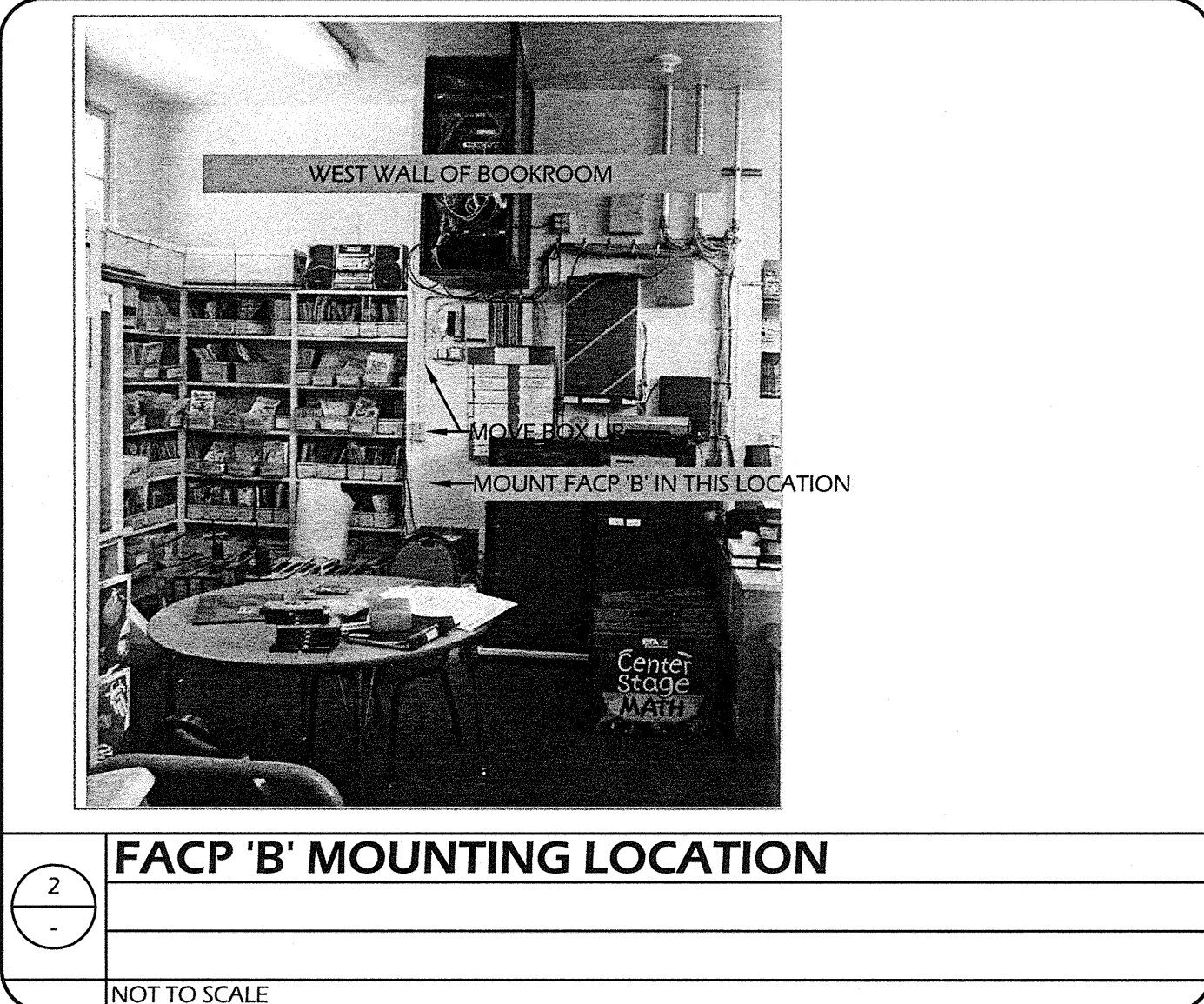
- THE SYSTEM SHOWN IS AN AUTOMATIC AND ADDRESSABLE SYSTEM.
- CLASS B WIRING METHOD IS UTILIZED FOR ALL SIGNALING CIRCUITS.



CABLE LEGEND

A = (2) #12 P = (2) #12
H = (2) #12
S = (2) #12

ALL UNDERGROUND CABLES SHALL BE LISTED FOR SUCH USE.



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Sheet Title: FIRE ALARM SYMBOL LEGEND, RISER DIAGRAM, NOTES, AND CALCULATIONS

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