

FACP Battery Calculation			5/9/2016		
PROJECT NAME: 11 BROWN ST - EASTMAN BLOCK CONDOS					
Required Standby Time: 24 Hours					
Required Alarm Time: 5 Minutes					
Device Type	Number of Devices	Current (Amps)	Current (Amps)	Total Current (Amps)	Total Current (Amps)
FACP - MS-9200UDLS MAIN CIRCUIT BOARD	1	X	14.500	14.500	14.500
XRM-24B	1	X	0.0000	0.0000	0.0000
ANN-80 REMOTE ANNUNCIATOR	1	X	0.01500	0.01500	0.01500
SD355 SMOKE DETECTOR	8	X	0.00330	0.02640	0.02640
MMF-301 MONITOR MODULE	3	X	0.00338	0.01013	0.01013
BC-12LX PULL STATION	11	X	0.00030	0.00330	0.00330
TOTAL STANDBY LOAD					
Regulated Load in ALARM					
Device Type	Number of Devices	Current (Amps)	Current (Amps)	Total Current (Amps)	Total Current (Amps)
FACP - MS-9200UDLS MAIN CIRCUIT BOARD	1	X	0.27500	0.27500	0.27500
XRM-24B	1	X	0.00000	0.00000	0.00000
ANN-80 REMOTE ANNUNCIATOR	1	X	0.04000	0.04000	0.04000
MAX ALARM DRAW - ALL ADDRESS DEVICES	1	X	0.40000	0.40000	0.40000
MAC-1 (See Voltage Drop Calculations)	1	X	0.77800	0.77800	0.77800
MAC-2 (See Voltage Drop Calculations)	1	X	1.16700	1.16700	1.16700
MAC-3 (See Voltage Drop Calculations)	1	X	0.81700	0.81700	0.81700
MAC-4 (Spare)	1	X	0.00000	0.00000	0.00000
TOTAL ALARM LOAD					
Battery Requirements					
Standby Load	0.16683	X	24.00000	4.00380	
Alarm Load	3.47700	X	Required Alarm Time in Hours	0.28975	
Current (Amps)			0.68333		
Total Amperes-Hours (before derating factor)				4.29305	
BATTERIES TO BE PROVIDED (2 - 12V)					
TOTAL AMPERE HOURS REQUIRED				5.15242	
				7 AHI	

Point to Point NAC Voltage Drop Calculation			5/9/2016		
Project Name: 11 BROWN ST - EASTMAN BLOCK CONDOS					
Circuit Number: NAC-2					
Nominal System Voltage: 20.4 volts					
Minimum Device Voltage: 16.0 volts					
Distance from source to 1st device: 14 feet					
Wire Gauge for balance of circuit: 14					
Max Output Current: 1.50 amps					
Total Circuit Current: 1.167 amps					
End of Line Voltage: 19.78 volts					
Circuit is within limits					
Device	Distance previous device	Device Current	Voltage at Device	Drop from source	Percent Drop
Device 1	0	0.178	20.28	0.12	0.59%
Device 2	20	0.176	20.08	0.20	1.57%
Device 3	22	0.176	19.97	0.30	2.11%
Device 4	22	0.176	19.85	0.40	2.94%
Device 5	5	0.079	19.94	0.464	2.27%
Device 6	5	0.079	19.84	0.464	2.27%
Device 7	42	0.079	19.81	0.563	2.87%
Device 8	7	0.066	19.80	0.595	2.92%
Device 9	18	0.107	19.79	0.615	3.01%
Device 10	3	0.066	19.78	0.616	3.02%
Totals		1.167	19.78	1.63	3.02%
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufacturer's listed minimum operating voltage (E: rated operating voltage 16-33 VDC (24 VDC nominal)).					

Point to Point NAC Voltage Drop Calculation			5/9/2016		
Project Name: 11 BROWN ST - EASTMAN BLOCK CONDOS					
Circuit Number: NAC-3					
Nominal System Voltage: 20.4 volts					
Minimum Device Voltage: 16.0 volts					
Distance from source to 1st device: 14 feet					
Wire Gauge for balance of circuit: 14					
Max Output Current: 1.50 amps					
Total Circuit Current: 0.817 amps					
End of Line Voltage: 19.73 volts					
Circuit is within limits					
Device	Distance previous device	Device Current	Voltage at Device	Drop from source	Percent Drop
Device 1	0	0.138	20.20	0.201	0.98%
Device 2	44	0.079	20.02	0.384	1.88%
Device 3	45	0.138	19.85	0.550	2.70%
Device 4	22	0.138	19.79	0.612	3.00%
Device 5	10	0.138	19.77	0.632	3.10%
Device 6	16	0.079	19.75	0.650	3.19%
Device 7	35	0.107	19.73	0.673	3.32%
Totals		0.817	19.73	212	
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufacturer's listed minimum operating voltage (E: rated operating voltage 16-33 VDC (24 VDC nominal)).					

FIRE ALARM SYMBOL LEGEND			RESERVED FOR CITY STAMP		
SYMBOL	DESCRIPTION	MOUNTING	SYMBOL	DESCRIPTION	MOUNTING
[FACP]	FIRE ALARM CONTROL PANEL	WALL-TOP @ 66"	[FAS]	FIRE ALARM POWER SUPPLY	FIELD VERIFY
[FSA]	FIRE SYSTEM ANNUNCIATOR	WALL-TOP @ 66"	[R]	120V RESIDENTIAL SMOKE/CO COMBO DETECTOR	CEILING
[R]	120V RESIDENTIAL SMOKE/CO COMBO DETECTOR	CEILING	[R]	120V RESIDENTIAL SMOKE DETECTOR	CEILING
[S]	SMOKE DETECTOR	CEILING	[S]	SMOKE DETECTOR	CEILING
[D]	DUCT SMOKE DETECTOR	BY OTHERS	[D]	DUCT SMOKE DETECTOR	BY OTHERS
[H]	HEAT DETECTOR	CEILING	[H]	HEAT DETECTOR	CEILING
[M]	ADDRESSABLE MONITOR MODULE	FIELD VERIFY	[M]	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
[P]	MANUAL PULL STATION	WALL @ 48"	[P]	MANUAL PULL STATION	WALL @ 48"
[E]	CONTROL RELAY (MULTI-VOLTAGE)	FIELD VERIFY	[E]	CONTROL RELAY (MULTI-VOLTAGE)	FIELD VERIFY
[RM]	ADDRESSABLE RELAY MODULE	FIELD VERIFY	[RM]	ADDRESSABLE RELAY MODULE	FIELD VERIFY
[RS]	REMOTE TEST STATION	FIELD VERIFY	[RS]	REMOTE TEST STATION	FIELD VERIFY
[W]	WATER FLOW SWITCH	BY OTHERS	[W]	WATER FLOW SWITCH	BY OTHERS
[V]	VALVE TAMPER SWITCH	BY OTHERS	[V]	VALVE TAMPER SWITCH	BY OTHERS
[K]	KITCHEN HOOD	BY OTHERS	[K]	KITCHEN HOOD	BY OTHERS
[C]	CEILING MOUNT STROBE	FIELD VERIFY	[C]	CEILING MOUNT STROBE	FIELD VERIFY
[H]	CEILING MOUNT HORN / STROBE	FIELD VERIFY	[H]	CEILING MOUNT HORN / STROBE	FIELD VERIFY
[S]	CEILING MOUNT SPEAKER / STROBE	FIELD VERIFY	[S]	CEILING MOUNT SPEAKER / STROBE	FIELD VERIFY
[U]	HORN, LF-LOW FREQUENCY	WALL @ 10'-0"	[U]	HORN, LF-LOW FREQUENCY	WALL @ 10'-0"
[H]	HORN / STROBE	WALL 80"-96"	[H]	HORN / STROBE	WALL 80"-96"
[S]	SPEAKER / STROBE	WALL 80"-96"	[S]	SPEAKER / STROBE	WALL 80"-96"
[S]	SPEAKER	WALL @ 90"	[S]	SPEAKER	WALL @ 90"
[K]	STROBE	WALL 80"-96"	[K]	STROBE	WALL 80"-96"
[K]	KNOX BOX	FIELD VERIFY	[K]	KNOX BOX	FIELD VERIFY
ABBREVIATION					
E	EXISTING				
G	WITH GUARD				
P	PENDENT MOUNT				
R	RESIDENTIAL (110V)				
S	ROUNDER BASE				
WP	WEATHER PROOF				
EOL	END OF LINE RESISTOR				
EOLR	END OF LINE RELAY				
AWG	AMERICAN WIRE GAUGE				
TWP	TWISTED PAIR				
TWSP	TWISTED SHIELDED PAIR				
FLPL	FIRE POWER LIMITED PLENUM				
FLPLR	FIRE POWER LIMITED RISER				

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	5/10/2016

CUNNINGHAM
Security Systems

10 Princes Point Road, Yarmouth, Maine 04096
Office: 207.846.3350 • Fax: 207.846.6080

EASTMAN BLOCK CONDOS
11 BROWN STREET
PORTLAND, MAINE 04101
CALCS, DETAILS, LEGEND, MATRIX, NOTES, RISER

DRAWN	JFB UNICAD JOB #16319
CHECKED	WAYNE B. HANS NICT # 90496
DATE	5/10/2016
REVISION	0
SCALE	NONE

FA-1

- GENERAL NOTES:**
- THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
 - INSTALLATION SHALL COMPLY WITH NEC, NFPA 72 AND ALL OTHER APPLICABLE CODES AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
 - WIRING DEPICTED ON THESE PLANS IS SCHEMATIC - ACTUAL WIRE LOCATIONS MAY DIFFER FROM THESE PLANS. WIRING SHALL BE PERFORMED AS ACTUAL BUILDING CONSTRUCTION CONDITIONS ALLOW AND TO MINIMIZE PENETRATIONS THROUGH AREA SEPARATION WALLS AND FIRE WALLS. THE USE OF A RACEWAY IS PERMITTED AS LONG AS NO 110V OR HIGHER VOLTAGE CABLES ARE IN THE SAME RACEWAY.
 - FIRE RATINGS SHALL BE MAINTAINED FOR ALL PENETRATIONS THROUGH FIRE-RATED CONSTRUCTION.
 - POWER FOR ALL FIRE ALARM PANELS AND FIRE ALARM POWER SUPPLIES MUST BE PROVIDED BY A DEDICATED AC BRANCH CIRCUIT.
 - POWER-LIMITED AND NONPOWER-LIMITED CIRCUIT WIRING MUST REMAIN SEPARATED IN CABINET. ALL POWER-LIMITED CIRCUIT WIRING MUST REMAIN AT LEAST 0.25" AWAY FROM ANY NONPOWER-LIMITED CIRCUIT WIRING. FURTHERMORE, ALL POWER-LIMITED AND NONPOWER-LIMITED CIRCUIT WIRING MUST ENTER AND EXIT THE CABINET THROUGH DIFFERENT KNOCK OUTS AND/OR SEPARATE CONDUITS.
 - WHEN UTILIZING CLASS "A" CIRCUITS, SEPARATE OUTGOING AND RETURN CONDUCTORS OF CLASS "A" CIRCUITS BY A MINIMUM OF 12" WHERE RUN VERTICALLY AND 48" WHERE RUN HORIZONTALLY.
 - WHEN UTILIZING SHIELDED CABLE, TIE SHIELDS THROUGH AND INSULATE AT EACH JUNCTION BOX. INSULATE AND TAPE BACK AT END.
 - ALL FIRE ALARM CABLING SHALL BE ACCEPTABLE TO THE FIRE ALARM EQUIPMENT MANUFACTURER FOR THE INTENDED PURPOSE.
 - SMOKE DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER CONSTRUCTION CLEAN-UP IS COMPLETED AND FINAL.
 - LOCATE SMOKE DETECTORS A MINIMUM OF THREE (3) FEET FROM MECHANICAL DIFFUSERS, WALL-MOUNTED. SMOKE DETECTORS SHALL BE LOCATED A MINIMUM OF 4' AND A MAXIMUM OF 12' FROM CEILING. CEILING-MOUNTED SMOKE DETECTORS SHALL BE MOUNTED ON CEILINGS AND NOT ON THE BOTTOMS OF BEAMS OR JOISTS.
 - PROVIDE SYNCHRONIZATION OF ALL VISUAL NOTIFICATION APPLIANCE CIRCUITS. PROVIDE ALL REQUIRED SYNC MODULES. PROVIDE A MULTI-SYNC MODE SLAVE CONNECTION BETWEEN ALL SYNC MODULES.
 - VERIFY ALL FIELD SELECTABLE AUDIBILITY SETTINGS OF NOTIFICATION APPLIANCES WITH FIRE ALARM CONTRACTOR.
 - UPON COMPLETION OF THE FIRE ALARM SYSTEM INSTALLATION AND PROGRAMMING, THE INSTALLING CONTRACTOR SHALL PERFORM FINAL TESTING OF THE ENTIRE SYSTEM, PER ALL APPLICABLE CODES, AND SHALL COORDINATE AND PERFORM A FINAL FIRE ALARM SYSTEM INSPECTION.
 - PROVIDE OFF-SITE MONITORING AS REQUIRED BY THE INTERNATIONAL FIRE CODE, SECTION 907.15 AND THE LOCAL AUTHORITY HAVING JURISDICTION.
 - INSTALLING CONTRACTOR SHALL, PHYSICALLY, LABEL ALL INITIATING DEVICES AND NOTIFICATION APPLIANCE CIRCUIT END OF LINE (WHEN WIRING CLASS "B"). THESE LABELS SHALL BE IN PLACE PRIOR TO START-UP AND TESTING.

APPLICABLE CODES:

MAINE UNIFORM ENERGY & BUILDING CODE
PORTLAND CITY CODE, CHAPTER 10, FIRE PREVENTION & PROTECTION
NFPA 1, FIRE CODE, & NFPA 101, LIFE SAFETY CODE

OPERATIONS MATRIX

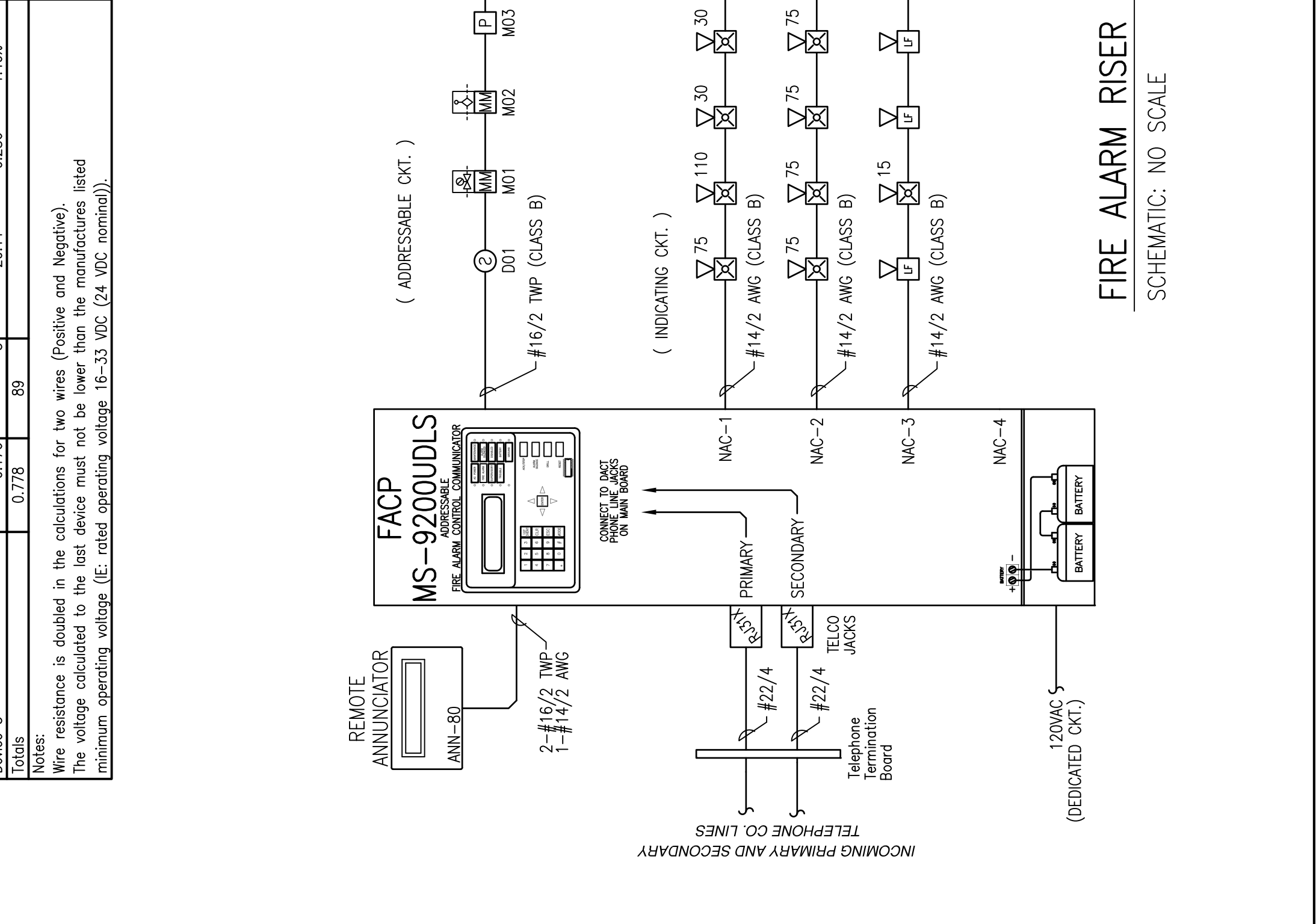
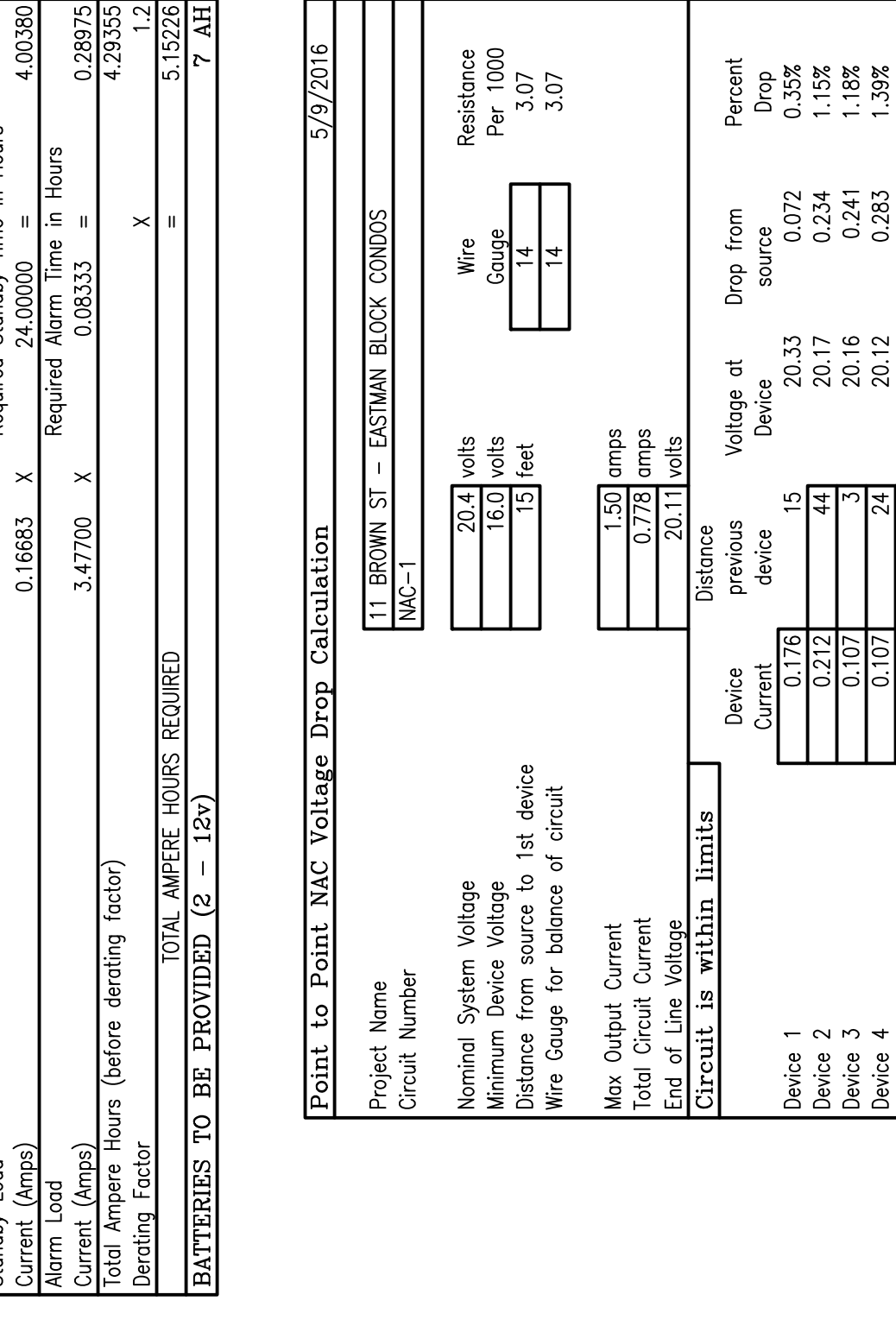
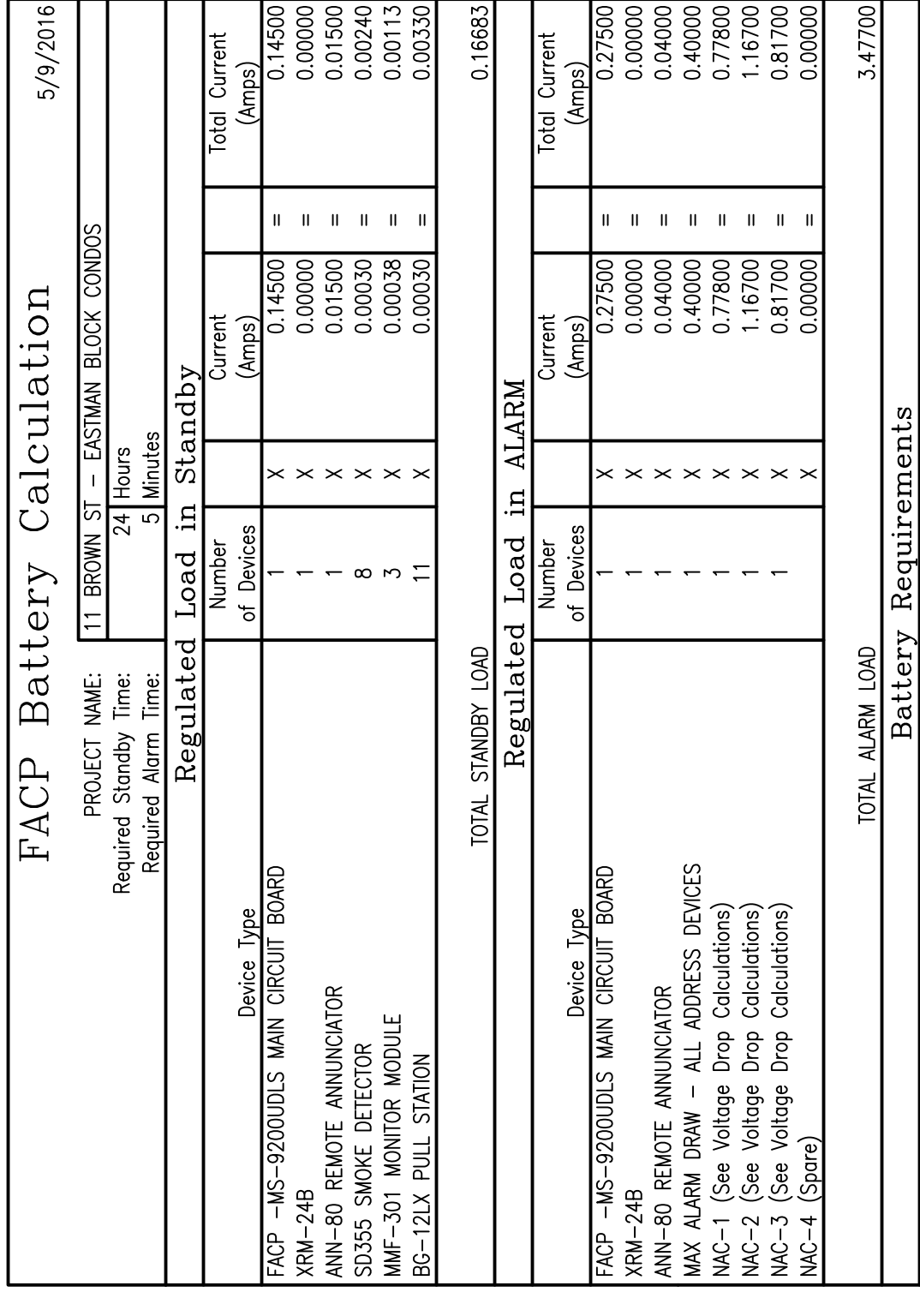
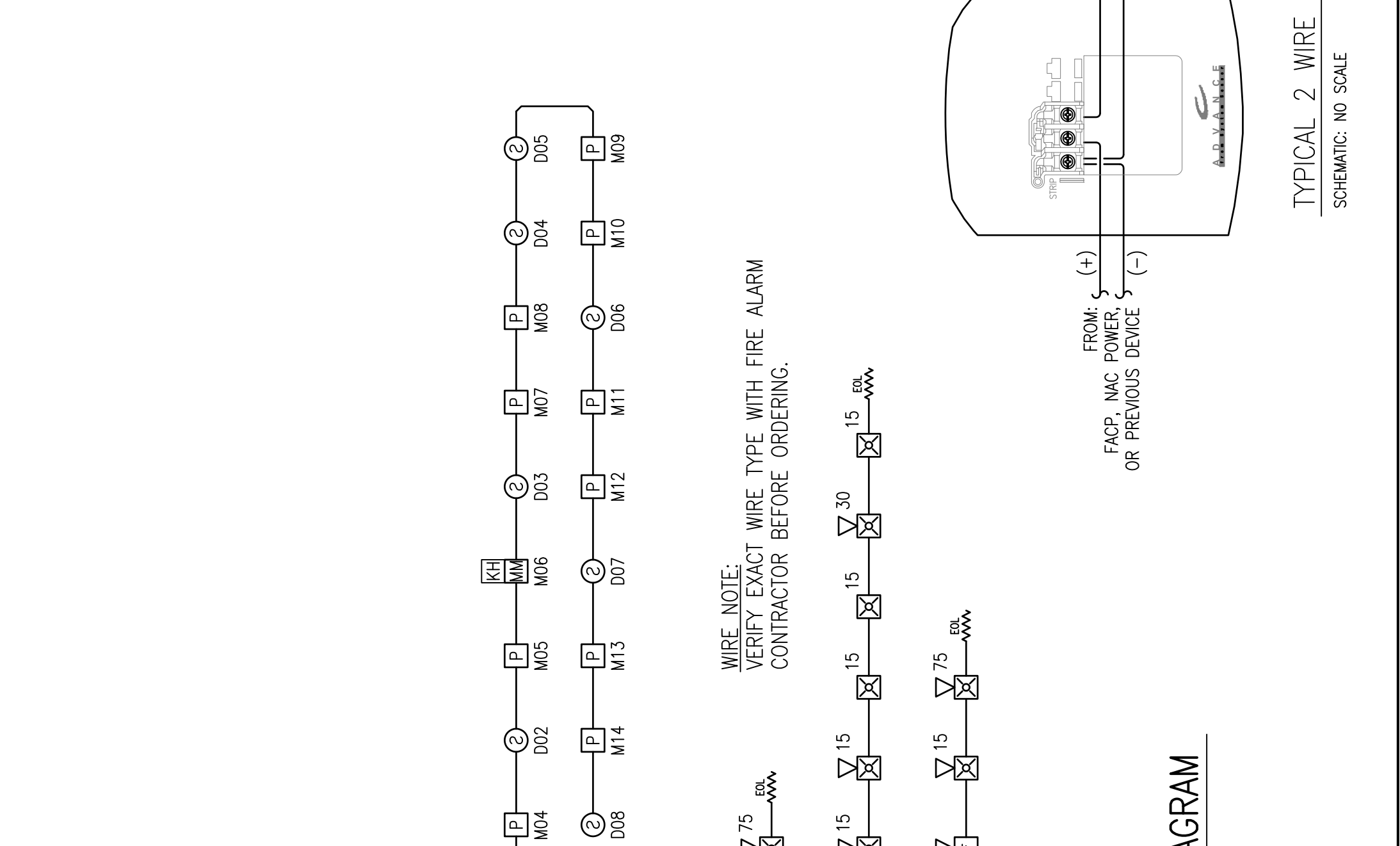
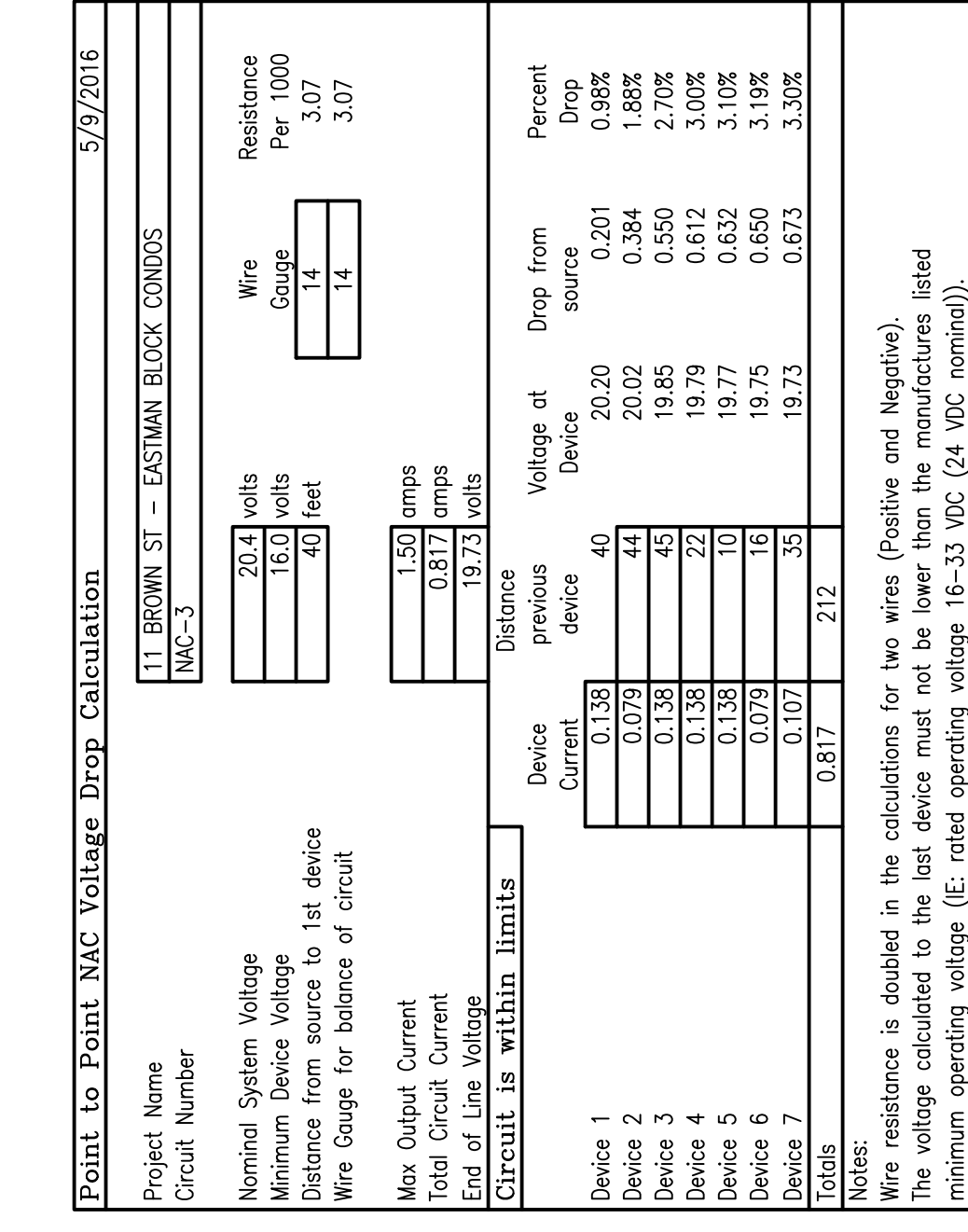
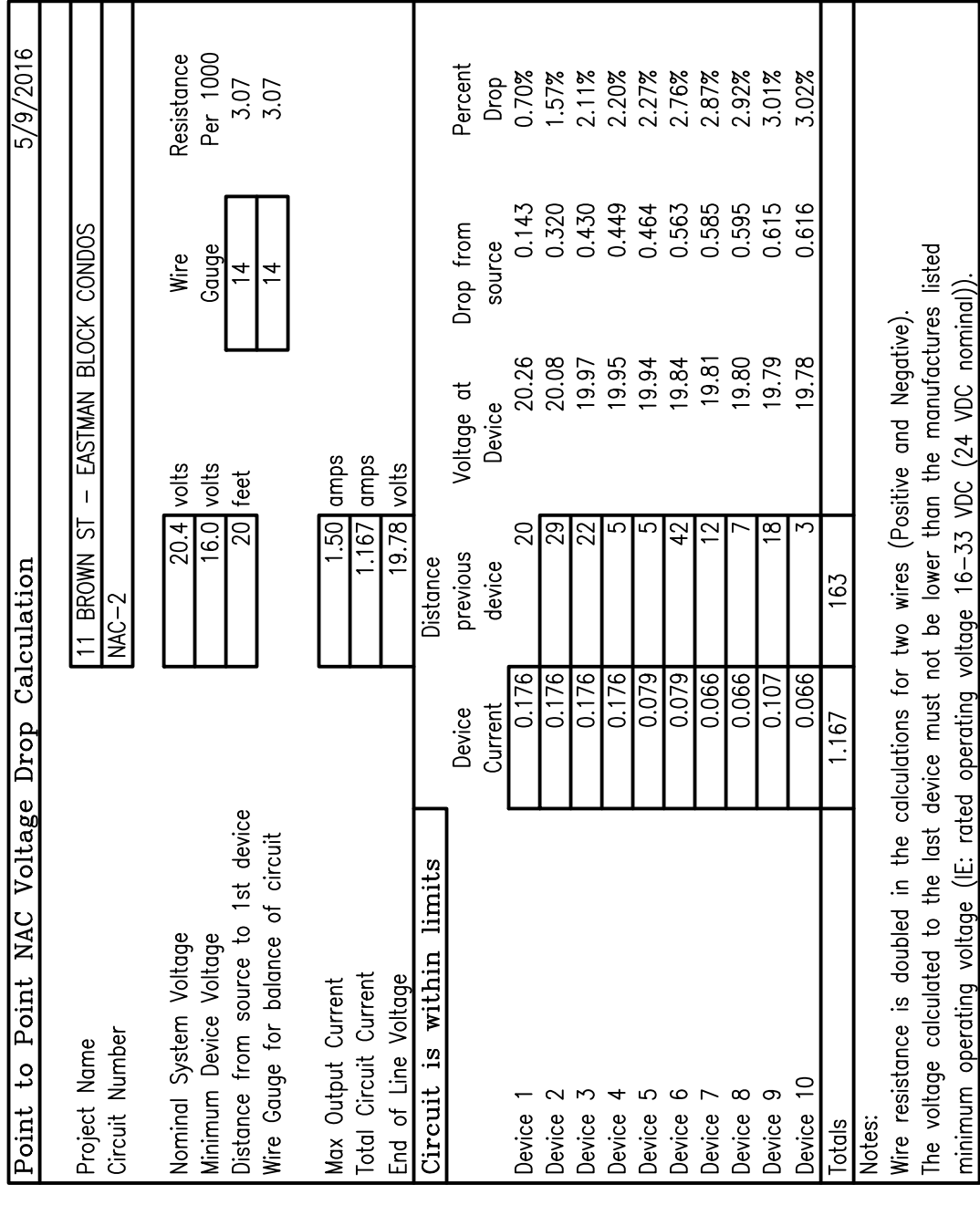
ACTIVATE ALARM INDICATOR	●	ACTIVATE ALARM INDICATOR	●
ACTIVATE SUPERVISORY INDICATOR	●	ACTIVATE SUPERVISORY INDICATOR	●
ACTIVATE TROUBLE INDICATOR	●	ACTIVATE TROUBLE INDICATOR	●
ACTIVATE AUDIBLE TROUBLE INDICATOR	●	ACTIVATE AUDIBLE TROUBLE INDICATOR	●
TRANSMIT ALARM SIGNAL	●	TRANSMIT ALARM SIGNAL	●
TRANSMIT SUPERVISORY SIGNAL	●	TRANSMIT SUPERVISORY SIGNAL	●
TRANSMIT TROUBLE SIGNAL	●	TRANSMIT TROUBLE SIGNAL	●
FIRE ALARM INPUT	●	FIRE ALARM INPUT	●
SMOKE DETECTORS	●	SMOKE DETECTORS	●
PULL STATIONS	●	PULL STATIONS	●
WATERFLOW SWITCHES	●	WATERFLOW SWITCHES	●
VALVE TAMPER SWITCHES	●	VALVE TAMPER SWITCHES	●
KITCHEN HOOD	●	KITCHEN HOOD	●
FIRE ALARM AC POWER FAIL	●	FIRE ALARM AC POWER FAIL	●
FIRE ALARM LOW BATTERY	●	FIRE ALARM LOW BATTERY	●
OPEN CIRCUIT	●	OPEN CIRCUIT	●
GROUND FAULT	●	GROUND FAULT	●
NAC SHORT CIRCUIT	●	NAC SHORT CIRCUIT	●
LOSS OF AC TO BUILDING	●	LOSS OF AC TO BUILDING	●

ADDRESSABLE SMOKE DETECTOR WIRING DETAIL
SCHEMATIC: NO SCALE

WATERFLOW / TAMPER WIRING DETAIL
SCHEMATIC: NO SCALE

MANUAL PULL STATION WIRING DETAIL
SCHEMATIC: NO SCALE

TYPICAL 2 WIRE STROBE WIRING DETAIL
SCHEMATIC: NO SCALE



UNICAD Inc.
Fire Alarm Design & Drafting Services

1750 Main Street
Portland, ME 04101
Office: 207.865.5410
www.unicad.net