Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
02/20/2020

OPERATIONS MATRIX

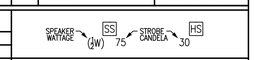
FIRE ALARM INPUT	FIRE ALARM OUTPUT: ACTIVATE ALARM INDICATOR	ACTIVATE AUDIBLE ALARM	ACTIVATE SUPERVISORY INDICATOR	ACTIVATE AUDIBLE SUPERVISORY SIGNAL	ACTIVATE TROUBLE INDICATOR	ACTIVATE AUDIBLE TROUBLE INDICATOR	TRANSMIT WATERFLOW SIGNAL	TRANSMIT ALARM SIGNAL	TRANSMIT SUPERVISORY SIGNAL	TRANSMIT TROUBLE SIGNAL	ACTIVATE NOTIFICATION APPLIANCES
SMOKE DETECTORS	●	●						●			●
HEAT DETECTORS	●	●						●			●
PULL STATIONS	●	●						●			●
FIRE ALARM AC POWER FAIL					●	●				●	
FIRE ALARM LOW BATTERY					●	●				●	
OPEN CIRCUIT					●	●				●	
GROUND FAULT					●	●				●	
NAC SHORT CIRCUIT					●	●				●	
LOSS OF AC TO BUILDING					●	●				●	

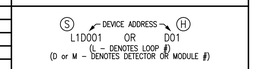
FIRE ALARM SYMBOL LEGEND

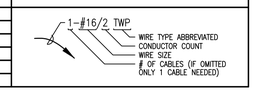
NOTE: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT

SYMBOL	DESCRIPTION	QTY	PART #	MOUNTING
FACP	FIRE ALARM CONTROL PANEL	1	ES-50X	WALL-TOP @ 66"
FSA	FIRE SYSTEM ANNUNCIATOR	1	ANN-80	WALL-TOP @ 66"
COM	CELLULAR COMMUNICATOR	1	AES	BY OTHERS
S	SMOKE DETECTOR	8	SD365	CEILING
H	HEAT DETECTOR	40	H365R	CEILING
P	PULL STATION	6	BG12LX	WALL-TOP @ 66"
	MINI HORN	11	MHR	WALL @ 10'-0
	HORN / STROBE	7	P2RL	WALL 80"-96"

ABBREVIATION	DESCRIPTION
E	EXISTING
G	WITH GUARD
P	PENDENT MOUNT
R	RESIDENTIAL (110V)
S	SOUNDER 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
FPLP	FIRE POWER LIMITED PLENUM
FPLR	FIRE POWER LIMITED RISER

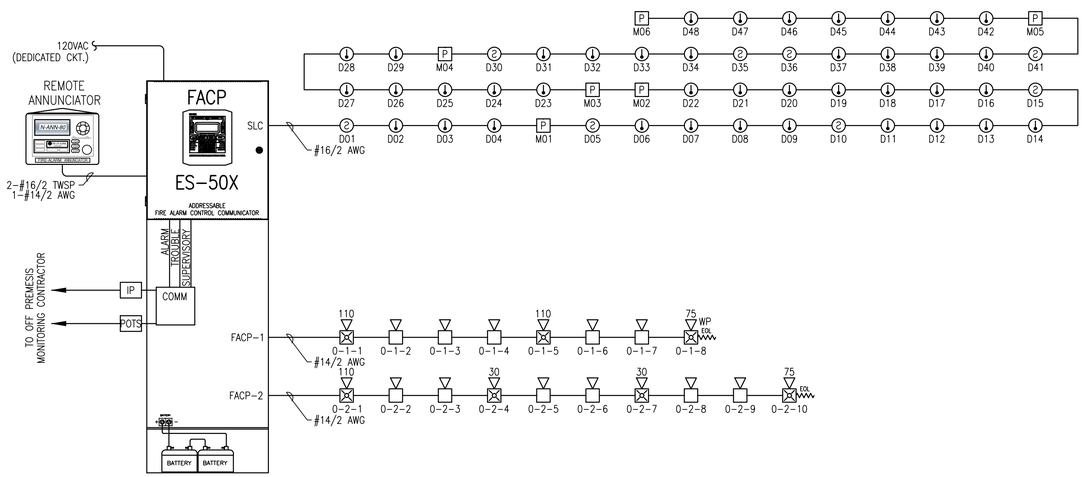






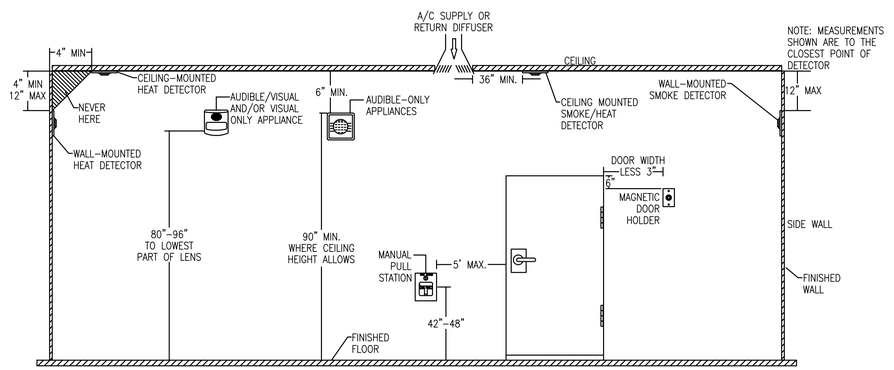
GENERAL NOTES:

1. SCOPE OF WORK: THIS PROJECT SHALL INCLUDE THE INSTALLATION OF A NEW FIRE ALARM SYSTEM WITH NOTIFICATION THROUGHOUT THE BUILDING.
2. THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
3. INSTALLATION SHALL COMPLY WITH NEC, NFPA 72 AND ALL OTHER APPLICABLE CODES AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
4. 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.
5. FIRE RATINGS SHALL BE MAINTAINED FOR ALL PENETRATIONS THROUGH FIRE-RATED CONSTRUCTION.
6. POWER FOR ALL FIRE ALARM PANELS AND FIRE ALARM POWER SUPPLIES MUST BE PROVIDED BY A DEDICATED AC BRANCH CIRCUIT. THE LOCATION OF THE BRANCH CIRCUIT BREAKER SHALL BE PERMANENTLY IDENTIFIED AT THE CONTROL UNIT AND SHALL HAVE A RED MARKING IN ACCORDANCE WITH NFPA 72.
7. 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.
8. 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.
9. WHEN UTILIZING SHIELDED CABLE TIE SHIELDS THROUGH AND INSULATE AT EACH JUNCTION BOX. INSULATE AND TAPE BACK AT END.
10. ALL FIRE ALARM CABLING SHALL BE ACCEPTABLE TO THE FIRE ALARM EQUIPMENT MANUFACTURER FOR THE INTENDED PURPOSE.
11. SMOKE DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER CONSTRUCTION CLEAN-UP IS COMPLETED AND FINAL.
12. 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.
13. PROVIDE SYNCHRONIZATION OF ALL VISUAL NOTIFICATION APPLIANCE CIRCUITS. PROVIDE ALL REQUIRED SYNC MODULES. PROVIDE A MULTI-SYNC MODE SLAVE CONNECTION BETWEEN ALL SYNC MODULES.
14. VERIFY ALL FIELD SELECTABLE AUDIBILITY SETTINGS OF NOTIFICATION APPLIANCES WITH FIRE ALARM CONTRACTOR.
15. 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.
16. PROVIDE OFF-SITE MONITORING AS REQUIRED BY THE INTERNATIONAL FIRE CODE, SECTION 907.6.5 AND THE LOCAL AUTHORITY HAVING JURISDICTION.
17. 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.



FIRE ALARM RISER DIAGRAM

SCHEMATIC: NO SCALE



FIRE ALARM DEVICE MOUNTING HEIGHTS

SCALE: NOT TO SCALE

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	2/6/2020

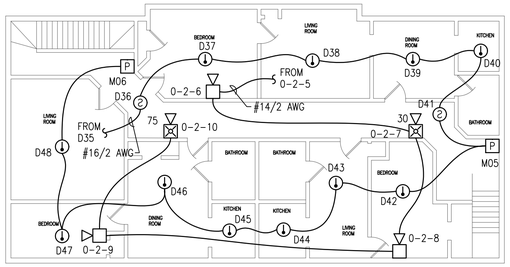
SEACOAST SECURITY
4 Summer Street • Freeport, Maine 04032
Office: (207) 706-3369 • Fax: (207) 865-0852

563 CUMBERLAND AVENUE
536 CUMBERLAND AV
PORTLAND, ME 04101
FIRE ALARM PLAN

DRAWN	BPL UNICAD JOB #20049
CHECKED	BRADY B. HAWS NICET IV 138751
DATE	2/6/2020
REVISION	0
SCALE	1/8"=1'-0"

shop drawings created by:
5794 W. 4600 So.
Hooper, UT 84315
Office: 801.985.0410
UNICAD Inc.
www.unicad.net
Fire Alarm Design & Drafting Services

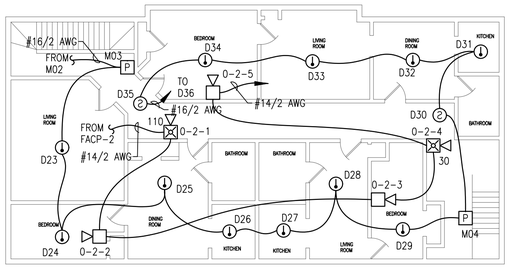
FA-1



N

FIRE ALARM PLAN LEVEL 3

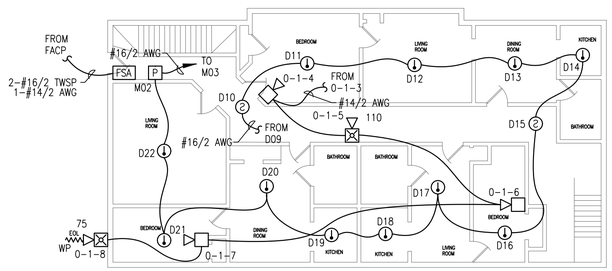
SCALE: 1/8"=1'-0" 0 4' 8' 16'



N

FIRE ALARM PLAN LEVEL 2

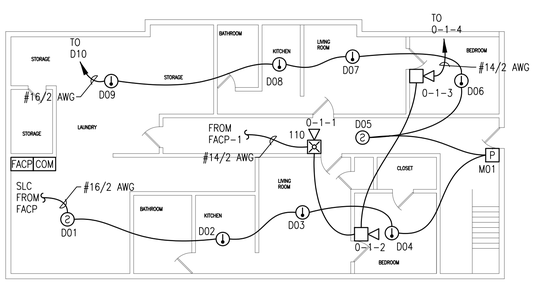
SCALE: 1/8"=1'-0" 0 4' 8' 16'



N

FIRE ALARM PLAN LEVEL 1

SCALE: 1/8"=1'-0" 0 4' 8' 16'



N

FIRE ALARM PLAN BASEMENT LEVEL

SCALE: 1/8"=1'-0" 0 4' 8' 16'

FACP Battery Calculation

2/6/2020

PROJECT NAME: 563 CUMBERLAND AVENUE
Required Standby Time: 24 Hours
Required Alarm Time: 5 Minutes

AC Branch Current

AC Branch Current: Amps @ 120V

Regulated Load in Standby

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
FACP MAINBOARD	1	X	0.00000	=	0.00000
SMOKE DETECTOR	8	X	0.00000	=	0.00000
HEAT DETECTOR	48	X	0.00000	=	0.00000
ANNUNCIATOR	1	X	0.00000	=	0.00000
TOTAL STANDBY LOAD					0.00000

Regulated Load in ALARM

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
FACP MAINBOARD	1	X	0.00000	=	0.00000
SMOKE DETECTOR	8	X	0.00000	=	0.00000
HEAT DETECTOR	48	X	0.00000	=	0.00000
PULL STATION	6	X	0.00000	=	0.00000
ANNUNCIATOR	1	X	0.00000	=	0.00000
FACP-1 (See Voltage Drop Calculations)	1	X	0.58500	=	0.58500
FACP-2 (See Voltage Drop Calculations)	1	X	0.53300	=	0.53300
FACP-3 (See Voltage Drop Calculations)	1	X	0.00000	=	0.00000
FACP-4 (See Voltage Drop Calculations)	1	X	0.00000	=	0.00000
TOTAL ALARM LOAD					1.11800

Battery Requirements

Standby Load			Required Standby Time in Hours		
Current (Amps)	0.00000	X	24.00000	=	0.00000
Alarm Load			Required Alarm Time in Hours		
Current (Amps)	1.11800	X	0.08333	=	0.09317
Total Ampere Hours (before derating factor)					0.09317
Derating Factor				X	1.2
TOTAL AMPERE HOURS REQUIRED				=	0.11180
BATTERIES TO BE PROVIDED (2 – 12v)					12 AH

Point to Point NAC Voltage Drop Calculation

2/6/2020

Project Name: 563 CUMBERLAND AVENUE
Circuit Number: FACP-1

Nominal System Voltage: 20.4 volts
Minimum Device Voltage: 16.0 volts
Distance from source to 1st device: 41 feet
Wire Gauge for balance of circuit

Wire Gauge	Resistance Per 1000
14	3.07
14	3.07

Max Output Current: 3.00 amps
Total Circuit Current: 0.585 amps
End of Line Voltage: 19.93 volts

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.162	41	20.25	0.147	0.72%
Device 2	0.017	21	20.20	0.202	0.99%
Device 3	0.017	27	20.13	0.269	1.32%
Device 4	0.017	20	20.08	0.317	1.55%
Device 5	0.162	19	20.04	0.360	1.77%
Device 6	0.017	28	20.00	0.396	1.94%
Device 7	0.017	43	19.95	0.447	2.19%
Device 8	0.176	22	19.93	0.471	2.31%
Totals	0.585	221			

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 manufactures listed minimum operating voltage (IE: rated operating voltage 16–33 VDC (24 VDC nominal)).

Point to Point NAC Voltage Drop Calculation

2/6/2020

Project Name: 563 CUMBERLAND AVENUE
Circuit Number: FACP-2

Nominal System Voltage: 20.4 volts
Minimum Device Voltage: 16.0 volts
Distance from source to 1st device: 60 feet
Wire Gauge for balance of circuit

Wire Gauge	Resistance Per 1000
14	3.07
14	3.07

Max Output Current: 3.00 amps
Total Circuit Current: 0.533 amps
End of Line Voltage: 19.84 volts

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.162	60	20.20	0.196	0.96%
Device 2	0.017	13	20.17	0.226	1.11%
Device 3	0.017	40	20.09	0.313	1.53%
Device 4	0.074	18	20.05	0.350	1.72%
Device 5	0.017	35	19.99	0.407	1.99%
Device 6	0.017	20	19.96	0.437	2.14%
Device 7	0.074	33	19.92	0.483	2.37%
Device 8	0.017	21	19.90	0.503	2.47%
Device 9	0.017	42	19.86	0.539	2.64%
Device 10	0.121	23	19.84	0.556	2.73%
Totals	0.533	305			

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 manufactures listed minimum operating voltage (IE: rated operating voltage 16–33 VDC (24 VDC nominal)).

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
02/20/2020

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	2/6/2020

SEACOAST SECURITY
4 Summer Street • Freeport, Maine 04032
Office: (207) 706-3369 • Fax: (207) 865-0852

563 CUMBERLAND AVENUE
536 CUMBERLAND AV
PORTLAND, ME 04101
FIRE ALARM PLAN

DRAWN	BPL UNICAD JOB #20049
CHECKED	BRADY B. HAWS NICET IV 138751
DATE	2/6/2020
REVISION	0
SCALE	1/8"=1'-0"

FA-2