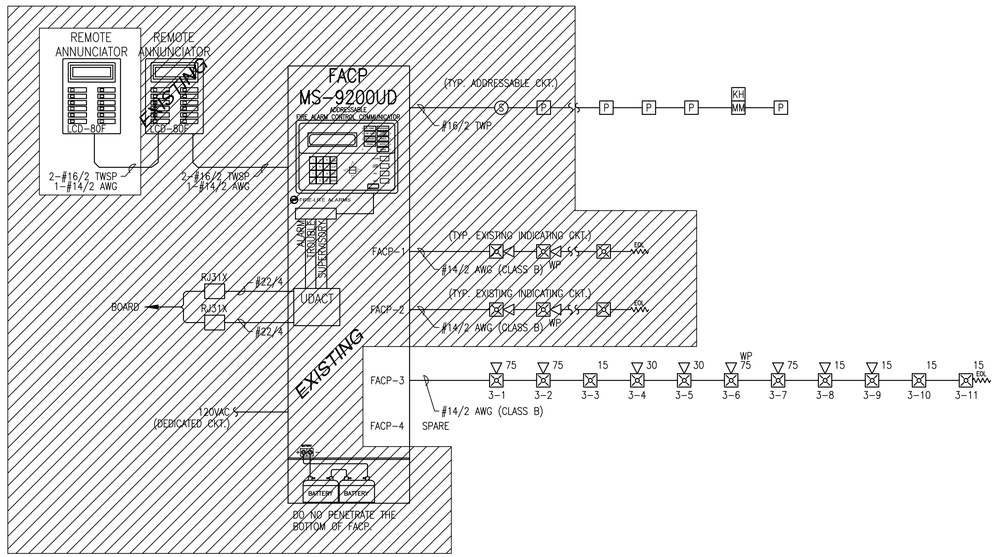

FIRE ALARM RISER DIAGRAM

SCHEMATIC: NO SCALE

FIRE ALARM SYMBOL LEGEND

NOTE: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT

SYMBOL	DESCRIPTION	MOUNTING
FACP E	EXISTING FIRE ALARM CONTROL PANEL	WALL–TOP @ 66"
(S) E	EXISTING SMOKE DETECTOR	CEILING
KH	KITCHEN HOOD	FIELD VERIFY
MM	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
P	MANUAL PULL STATION	WALL @ 48"
	HORN / STROBE	WALL 80"–96"
	STROBE	WALL 80"–96"

ABBREVIATION	DESCRIPTION
E	EXISTING
G	WITH GUARD
P	PENDANT 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
NAC	NOTIFICATION APPLIANCE CIRCUIT
SLC	SIGNALING LINE CIRCUIT

SPEAKER WATTAGE (¼W) 75 — STROBE CANDELA 30

(S) DEVICE ADDRESS — L1D001 OR D01 (L – DENOTES LOOP #) (D or M – DENOTES DETECTOR OR MODULE #)

1–#16/2 TWP — WIRE TYPE ABBREVIATED; CONDUCTOR COUNT; WIRE SIZE; # OF CABLES (IF OMITTED ONLY 1 CABLE NEEDED)

GENERAL NOTES:

1. SCOPE OF WORK: THIS PROJECT SHALL INCLUDE THE INSTALLATION OF A NEW NAC TO AN EXISTING FIRE ALARM SYSTEM IN AN EXISTING 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. CEILING–MOUNTED SMOKE DETECTORS SHALL BE MOUNTED ON CEILINGS AND NOT ON THE BOTTOMS OF BEAMS OR JOISTS.
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.

FACP Additional Load Calc

12/1/2017

PROJECT NAME:	LIO RESTAURANT				
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)
PULL STATION	4	X	0.00030	=	0.00120
MONITOR MODULE	1	X	0.00040	=	0.00040
ANNUNCIATOR	1	X	0.01500	=	0.01500
TOTAL STANDBY LOAD					0.01660
Regulated Load in ALARM					
Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
PULL STATION	4	X	0.00650	=	0.02600
MONITOR MODULE	1	X	0.00650	=	0.00650
ANNUNCIATOR	1	X	0.04000	=	0.04000
FACP–3	1	X	1.27400	=	1.27400
TOTAL ALARM LOAD					1.34650
Battery Requirements					
Standby Load			Required Standby Time in Hours		
Current (Amps)	0.01660	X	24.00000	=	0.39840
Alarm Load			Required Alarm Time in Hours		
Current (Amps)	1.34650	X	0.08333	=	0.11221
Total Ampere Hours (before derating factor)					0.51061
Derating Factor				X	1.2
ADDITIONAL AMPERE HOURS REQUIRED				=	0.61273
BATTERIES TO BE PROVIDED (2 – 12v)					FIELD VERIFY

NOTE: THE ABOVE BATTERY CALCULATION IS A COMBINED TOTAL OF THE ADDITIONAL LOADS THAT WILL BE ADDED FROM THE SCOPE OF THIS PROJECT. FIELD VERIFY THE SIZE OF THE EXISTING BATTERIES AND UPSIZE ACCORDINGLY.

Point to Point NAC Voltage Drop Calculation

12/1/2017

Project Name	LIO RESTAURANT			
Circuit Number	FACP–3			
Nominal System Voltage	20.4	volts	Wire Gauge	Resistance Per 1000
Minimum Device Voltage	16.0	volts	14	3.07
Distance from source to 1st device	50	feet	14	3.07
Wire Gauge for balance of circuit				
Max Output Current	3.00	amps		
Total Circuit Current	1.274	amps		
End of Line Voltage	18.96	volts		

Circuit is within limits	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.176	50	20.01	0.391	1.92%
Device 2	0.176	50	19.67	0.728	3.57%
Device 3	0.066	25	19.53	0.870	4.26%
Device 4	0.107	25	19.40	1.001	4.91%
Device 5	0.107	15	19.33	1.070	5.25%
Device 6	0.176	30	19.21	1.188	5.83%
Device 7	0.176	40	19.10	1.303	6.39%
Device 8	0.079	50	19.01	1.392	6.82%
Device 9	0.079	25	18.98	1.424	6.98%
Device 10	0.066	15	18.96	1.436	7.04%
Device 11	0.066	10	18.96	1.440	7.06%
Totals	1.274				

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)).

OPERATIONS MATRIX

EXISTING

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

NICET IV Fire Alarm Systems
Wayne B. Haws / Signature
Date: 12/1/17
Fire Protection Engineering Technology
Fire Alarm Systems
Cert. No. 90496
Exp 5/1/2020

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REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	12/1/2017

CUNNINGHAM
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PORTLAND, MAINE 04101
NOTES, CALCULATIONS & RISER DIAGRAM

DRAWN	CWS UNICAD JOB #17247
CHECKED	WAYNE B. HAWS NICET IV 90496
DATE	12/1/2017
REVISION	0
SCALE	1/8"=1'–0"

FA-3