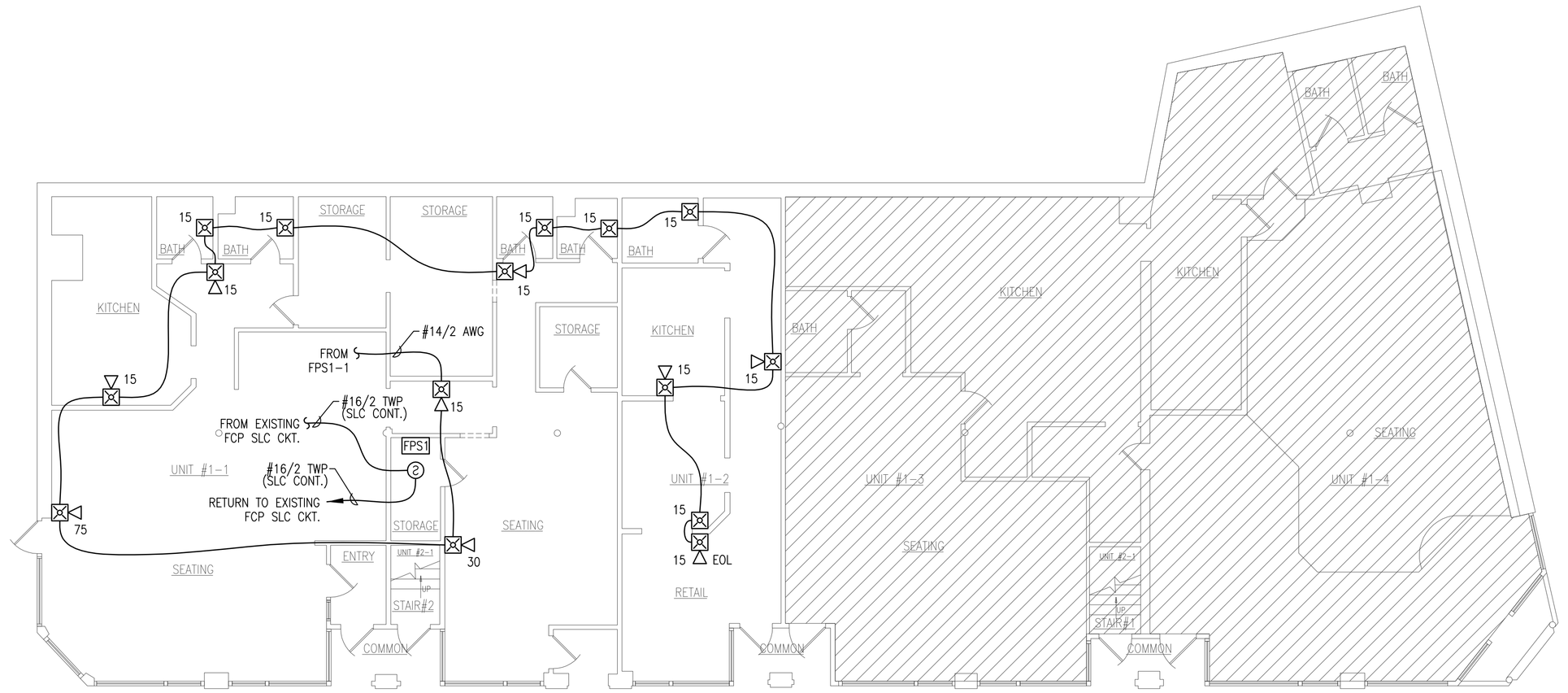

PLAN NORTH

FIRST FLOOR FIRE ALARM PLAN

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

RESERVED FOR CITY STAMP

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	1/24/2014

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

COMMERCIAL PROPERTIES, INC.
80-90 MIDDLE STREET
PORTLAND, MAINE 04101
CALCS & FIRST FLOOR FIRE ALARM PLAN

Existing FCP Battery Calculation

1/24/2014

PROJECT NAME: 80 MIDDLE STREET
Required Standby Time: 24 Hours
Required Alarm Time: 5 Minutes

Regulated Load in Standby

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
Existing MS-9050UD System		X		=	0.00000
SD355 Smoke Detector	1	X	0.00030	=	0.00030
TOTAL STANDBY LOAD					0.00030

Regulated Load in ALARM

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
Existing MS-9050UD System		X		=	0.00000
SD355 Smoke Detector	1	X	0.00650	=	0.00650
TOTAL ALARM LOAD					0.00650

Battery Requirements

Standby Load			Required Standby Time in Hours		
Current (Amps)	0.00030	X	24.00000	=	0.00720
Alarm Load			Required Alarm Time in Hours		
Current (Amps)	0.00650	X	0.08333	=	0.00054
Total Ampere Hours (before derating factor)					0.00774
Derating Factor				X	1.2
TOTAL AMPERE HOURS REQUIRED				=	0.00929
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.

FPS1 Battery Calculation

1/24/2014

PROJECT NAME: 80 MIDDLE STREET
Required Standby Time: 24 Hours
Required Alarm Time: 5 Minutes

AC Branch Current

AC Branch Current: 3.2 Amps @ 120V

Regulated Load in Standby

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
FCPS-24FS6 Main Circuit Board	1	X	0.06500	=	0.06500
TOTAL STANDBY LOAD					0.06500

Regulated Load in ALARM

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
FCPS-24FS6 Main Circuit Board	1	X	0.14500	=	0.14500
FPS1-1 (See voltage drop calc for device quantity)	1	X	1.23200	=	1.23200
FPS1-2	1	X	1.49700	=	1.49700
TOTAL ALARM LOAD					2.87400

Battery Requirements

Standby Load			Required Standby Time in Hours		
Current (Amps)	0.06500	X	24.00000	=	1.56000
Alarm Load			Required Alarm Time in Hours		
Current (Amps)	2.87400	X	0.08333	=	0.23950
Total Ampere Hours (before derating factor)					1.79950
Derating Factor				X	1.2
TOTAL AMPERE HOURS REQUIRED				=	2.15940
BATTERIES TO BE PROVIDED (2 – 12v)					7 AH

NAC Circuit Voltage Drop Calculation

1/24/2014

Project Name: 80 MIDDLE STREET
Circuit Number: FPS1-1

			Wire Gauge	Resistance Per 1000
Nominal System Voltage	20.4	volts		
Minimum Device Voltage	16	volts		
Distance from source to 1st device	10		14	6.14
Wire Gauge for balance of circuit			14	6.14
Max Output Current	1.5	amps		
Total Circuit Current	1.232	amps		

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.079		20.32	0.08	0%
Device 2	0.107	17	20.20	0.20	1%
Device 3	0.176	40	19.95	0.45	2%
Device 4	0.079	16	19.86	0.54	3%
Device 5	0.079	23	19.75	0.65	3%
Device 6	0.066	5	19.73	0.67	3%
Device 7	0.066	8	19.70	0.70	3%
Device 8	0.079	23	19.61	0.79	4%
Device 9	0.066	10	19.58	0.82	4%
Device 10	0.066	6	19.57	0.83	4%
Device 11	0.066	10	19.54	0.86	4%
Device 12	0.079	22	19.50	0.90	4%
Device 13	0.079	15	19.48	0.92	4%
Device 14	0.066	17	19.47	0.93	5%
Device 15	0.079	2	19.47	0.93	5%
Totals	1.232	224			

NAC Circuit Voltage Drop Calculation

1/24/2014

Project Name: 80 MIDDLE STREET
Circuit Number: FPS1-2

			Wire Gauge	Resistance Per 1000
Nominal System Voltage	20.4	volts		
Minimum Device Voltage	16	volts		
Distance from source to 1st device	25		14	6.14
Wire Gauge for balance of circuit			14	6.14
Max Output Current	2.0	amps		
Total Circuit Current	1.497	amps		

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.176		20.17	0.23	1%
Device 2	0.079	21	20.00	0.40	2%
Device 3	0.079	2	19.98	0.42	2%
Device 4	0.066	17	19.86	0.54	3%
Device 5	0.066	13	19.78	0.62	3%
Device 6	0.079	7	19.73	0.67	3%
Device 7	0.079	24	19.59	0.81	4%
Device 8	0.079	20	19.48	0.92	4%
Device 9	0.107	24	19.37	1.03	5%
Device 10	0.079	12	19.32	1.08	5%
Device 11	0.066	18	19.25	1.15	6%
Device 12	0.079	26	19.16	1.24	6%
Device 13	0.066	14	19.12	1.28	6%
Device 14	0.107	30	19.05	1.35	7%
Device 15	0.066	11	19.03	1.37	7%
Device 16	0.066	4	19.02	1.38	7%
Device 17	0.079	10	19.01	1.39	7%
Device 18	0.079	32	19.00	1.40	7%
Totals	1.497	310			

DRAWN	JPB UNICAD JOB #14028
CHECKED	WAYNE B. HAWS NICET IV 90496
DATE	1/23/2014
REVISION	0
SCALE	1/8"=1'-0"

FA-2