

**FCP Battery Calculation**

10/1/2014

PROJECT NAME: 66 PEARL 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)
MS-9600UNIS Main Circuit Board	1	0.10300	0.10300
DAC1-U02	1	0.01700	0.01700
ANN-80 Remote Annunciator	1	0.01500	0.01500
S0355 Smoke Detectors	3	0.00030	0.00090
M355 Heat Detectors	2	0.00030	0.00060
MWF-500 Monitor Modules	3	0.00040	0.00120
BR-121X Pull Stations	4	0.00030	0.00120
CR-300 Relay Modules	14	0.00027	0.00378
<b>TOTAL STANDBY LOAD</b>			<b>0.14478</b>

Regulated Load in ALARM			
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
MS-9600UNIS Main Circuit Board	1	0.25300	0.25300
DAC1-U02	1	0.02900	0.02900
ANN-80 Remote Annunciator	1	0.04000	0.04000
Max Alarm Draw - SIC-1 Addressable Devices	1	0.40000	0.40000
NAC-1 (See voltage drop calcs for device quantity)	1	1.24400	1.24400
NAC-2	1	0.86500	0.86500
<b>TOTAL ALARM LOAD</b>			<b>2.83100</b>

Battery Requirements			
Standby Load	0.14478	Required Standby Time in Hours	3.47472
Alarm Load	2.83100	Required Alarm Time in Hours	0.23592
Current (Amps)			0.08333
Total Ampere Hours (before derating factor)			3.71064
Derating Factor			X
<b>TOTAL AMPERE HOURS REQUIRED</b>			<b>4.5276</b>

**BATTERIES TO BE PROVIDED (2 - 12V)** = 7 AH

**FPS1 Battery Calculation**

10/1/2014

PROJECT NAME: 66 PEARL 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)
EGPS-24FS8 Main Circuit Board	1	0.06500	0.06500
<b>TOTAL STANDBY LOAD</b>			<b>0.06500</b>

Regulated Load in ALARM			
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
FPS2-24FS8 Main Circuit Board	1	0.14500	0.14500
FPS1-1 (See voltage drop calcs for device quantity)	1	1.39300	1.39300
FPS1-2	1	1.60500	1.60500
FPS1-3	1	1.45700	1.45700
FPS1-4	1	1.82000	1.82000
<b>TOTAL ALARM LOAD</b>			<b>6.42000</b>

Battery Requirements			
Standby Load	0.06500	Required Standby Time in Hours	1.58000
Alarm Load	6.42000	Required Alarm Time in Hours	0.53500
Current (Amps)			0.08333
Total Ampere Hours (before derating factor)			2.09500
Derating Factor			X
<b>TOTAL AMPERE HOURS REQUIRED</b>			<b>2.51400</b>

**FPS2 Battery Calculation**

10/1/2014

PROJECT NAME: 66 PEARL 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)
EGPS-24FS8 Main Circuit Board	1	0.06500	0.06500
<b>TOTAL STANDBY LOAD</b>			<b>0.06500</b>

Regulated Load in ALARM			
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
FPS2-24FS8 Main Circuit Board	1	0.14500	0.14500
FPS2-1 (See voltage drop calcs for device quantity)	1	1.39600	1.39600
FPS2-2	1	1.69700	1.69700
<b>TOTAL ALARM LOAD</b>			<b>3.20800</b>

Battery Requirements			
Standby Load	0.06500	Required Standby Time in Hours	1.58000
Alarm Load	3.20800	Required Alarm Time in Hours	0.26733
Current (Amps)			0.08333
Total Ampere Hours (before derating factor)			1.82733
Derating Factor			X
<b>TOTAL AMPERE HOURS REQUIRED</b>			<b>2.19280</b>

**BATTERIES TO BE PROVIDED (2 - 12V)** = 7 AH

**NAC Circuit Voltage Drop Calculation**

9/25/2014

Project Name	66 PEARL STREET
Circuit Number	NAC-1
Nominal System Voltage	20.4 volts
Minimum Device Voltage	16 volts
Distance from source to 1st device	80
Wire Gauge for balance of circuit	14
Wire Resistance Per 1000	6.14
Max Output Current	1.3 amps
Total Circuit Current	1.244 amps

Circuit is within limits			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.079	23	19.79
Device 2	0.107	11	19.62
Device 3	0.176	31	19.35
Device 4	0.176	16	19.35
Device 5	0.245	19	19.07
Device 6	0.245	50	18.90
Device 7	0.107	11	18.87
Device 8	0.176	24	18.83
Device 9	0.066	5	18.82
Device 10	0.066	297	1.58
<b>Totals</b>			<b>1.244</b>

NAC Circuit Voltage Drop Calculation			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.079	23	20.11
Device 2	0.079	28	20.11
Device 3	0.079	2	19.98
Device 4	0.107	41	19.85
Device 5	0.212	67	19.67
Device 6	0.212	45	19.62
<b>Totals</b>			<b>0.865</b>

NAC Circuit Voltage Drop Calculation			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.176	28	20.11
Device 2	0.079	2	19.98
Device 3	0.107	41	19.85
Device 4	0.212	67	19.67
Device 5	0.212	45	19.62
<b>Totals</b>			<b>0.865</b>

Circuit is within limits			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.176	28	20.11
Device 2	0.079	2	19.98
Device 3	0.107	41	19.85
Device 4	0.212	67	19.67
Device 5	0.212	45	19.62
<b>Totals</b>			<b>0.865</b>

**NAC Circuit Voltage Drop Calculation**

9/12/2014

Project Name	66 PEARL STREET
Circuit Number	FPS1-1
Nominal System Voltage	20.4 volts
Minimum Device Voltage	16 volts
Distance from source to 1st device	15
Wire Gauge for balance of circuit	14
Wire Resistance Per 1000	6.14
Max Output Current	2.0 amps
Total Circuit Current	1.393 amps

Circuit is within limits			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.079	10	20.27
Device 2	0.066	6	20.19
Device 3	0.079	32	19.91
Device 4	0.079	24	19.75
Device 5	0.079	85	19.62
Device 6	0.176	33	19.45
Device 7	0.107	12	19.32
Device 8	0.066	43	19.20
Device 9	0.066	43	19.20
Device 10	0.079	26	19.14
Device 11	0.079	37	19.04
Device 12	0.079	31	19.00
Device 13	0.066	3	18.99
Device 14	0.066	3	18.97
Device 15	0.079	19	18.97
Device 16	0.107	13	18.96
<b>Totals</b>			<b>1.393</b>

**NAC Circuit Voltage Drop Calculation**

10/1/2014

Project Name	66 PEARL STREET
Circuit Number	FPS1-2
Nominal System Voltage	20.4 volts
Minimum Device Voltage	16 volts
Distance from source to 1st device	40
Wire Gauge for balance of circuit	14
Wire Resistance Per 1000	6.14
Max Output Current	2.0 amps
Total Circuit Current	1.605 amps

Circuit is within limits			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.079	9	19.92
Device 2	0.079	2	19.90
Device 3	0.079	16	19.72
Device 4	0.079	50	19.55
Device 5	0.176	22	19.37
Device 6	0.176	22	19.17
Device 7	0.079	11	19.10
Device 8	0.066	16	19.08
Device 9	0.079	11	19.02
Device 10	0.079	30	18.88
Device 11	0.079	18	18.81
Device 12	0.066	10	18.77
Device 13	0.212	20	18.71
Device 14	0.079	5	18.70
Device 15	0.079	19	18.67
Device 16	0.066	12	18.66
Device 17	0.066	9	18.66
<b>Totals</b>			<b>1.605</b>

NAC Circuit Voltage Drop Calculation			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.107	18	20.09
Device 2	0.066	18	19.94
Device 3	0.079	28	19.92
Device 4	0.079	15	19.71
Device 5	0.107	13	19.62
Device 6	0.107	27	19.46
Device 7	0.079	29	19.30
Device 8	0.066	30	19.22
Device 9	0.066	30	19.02
Device 10	0.079	21	19.02
Device 11	0.066	12	18.94
Device 12	0.066	12	18.90
Device 13	0.066	13	18.86
Device 14	0.107	22	18.81
Device 15	0.079	15	18.78
Device 16	0.212	23	18.75
<b>Totals</b>			<b>1.457</b>

NAC Circuit Voltage Drop Calculation			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.107	18	20.09
Device 2	0.066	18	19.94
Device 3	0.079	28	19.92
Device 4	0.079	15	19.71
Device 5	0.107	13	19.62
Device 6	0.107	27	19.46
Device 7	0.079	29	19.30
Device 8	0.066	30	19.22
Device 9	0.066	30	19.02
Device 10	0.079	21	19.02
Device 11	0.066	12	18.94
Device 12	0.066	12	18.90
Device 13	0.066	13	18.86
Device 14	0.107	22	18.81
Device 15	0.079	15	18.78
Device 16	0.212	23	18.75
<b>Totals</b>			<b>1.457</b>

Circuit is within limits			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.107	18	20.09
Device 2	0.066	18	19.94
Device 3	0.079	28	19.92
Device 4	0.079	15	19.71
Device 5	0.107	13	19.62
Device 6	0.107	27	19.46
Device 7	0.079	29	19.30
Device 8	0.066	30	19.22
Device 9	0.066	30	19.02
Device 10	0.079	21	19.02
Device 11	0.066	12	18.94
Device 12	0.066	12	18.90
Device 13	0.066	13	18.86
Device 14	0.107	22	18.81
Device 15	0.079	15	18.78
Device 16	0.212	23	18.75
<b>Totals</b>			<b>1.457</b>

NAC Circuit Voltage Drop Calculation			
Device	Current	Distance previous device	Voltage at Device
Device 1	0.066	17	19.62
Device 2	0.079	31	19.43
Device 3	0.094	3	19.12
Device 4	0.107	3	19.09
Device 5	0.066	14	18.96
Device 6	0.066	26	18.74
Device 7	0.066	20	18.57
Device 8	0.066	20	18.53
Device 9	0.176	2	18.35
Device 10	0.176	2	18.35
Device 11	0.066	14	18.22
Device 12	0.066	17	18.22
Device 13	0.066	13	18.14
Device 14	0.079	25	18.02
Device 15	0.176	2	17.97
Device 16	0.079	15	17.80
Device 17	0.079	63	17.77
Device 18	0.066	13	17.68
Device 19</			