

FCP Battery Calculation

PROJECT NAME: TWO CANAL PLAZA
 Required Standby Time: 24 Hours
 Required Alarm Time: 5 Minutes

Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
NS-9200DLS Main Circuit Board	1	0.14500	0.14500
ANN-80 Remote Annunciator	1	0.01500	0.01500
SD355 Smoke Detectors	12	0.00030	0.00360
H355 Heat Detectors	4	0.00030	0.00120
MMF-300 Monitor Modules	17	0.00040	0.00680
BC-12LX Pull Stations	3	0.00030	0.00090
CRF-300 Relay Modules	8	0.00027	0.00216
TOTAL STANDBY LOAD			0.17466

Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
NS-9200DLS Main Circuit Board	1	0.27500	0.27500
ANN-80 Remote Annunciator	1	0.04000	0.04000
Maximum Alarm Draw All Addressable Devices	2	0.40000	0.80000
FCPS (Remote Sync)	1	0.02170	0.02170
NAC-1	1	1.44200	1.44200
NAC-2	1	0.79400	0.79400
TOTAL ALARM LOAD			2.99440

Battery Requirements	
Standby Load	0.17466 X Required Standby Time in Hours = 4.19184
Alarm Load	2.99440 X Required Alarm Time in Hours = 0.24953
Total Amperes Hours (before derating factor)	4.44137
Derating Factor	X
TOTAL AMPERE HOURS REQUIRED	5.32985
BATTERIES TO BE PROVIDED (2 - 12v)	7 AH

FPS1 Battery Calculation

PROJECT NAME: TWO CANAL PLAZA
 Required Standby Time: 24 Hours
 Required Alarm Time: 5 Minutes

Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
FCPS-24FS6 Main Circuit Board	1	0.14500	0.14500
FPS1-1	1	0.77500	0.77500
FPS1-2	1	1.10500	1.10500
FPS1-3	1	0.96900	0.96900
FPS1-4	1	0.86000	0.86000
TOTAL ALARM LOAD			3.85400

Battery Requirements	
Standby Load	0.06500 X Required Standby Time in Hours = 1.56000
Alarm Load	3.85400 X Required Alarm Time in Hours = 0.32117
Total Amperes Hours (before derating factor)	1.88117
Derating Factor	X
TOTAL AMPERE HOURS REQUIRED	2.25740
BATTERIES TO BE PROVIDED (2 - 12v)	7 AH

FPS2 Battery Calculation

PROJECT NAME: TWO CANAL PLAZA
 Required Standby Time: 24 Hours
 Required Alarm Time: 5 Minutes

Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
FCPS-24FS6 Main Circuit Board	1	0.14500	0.14500
FPS2-1	1	0.69600	0.69600
FPS2-2	1	1.03900	1.03900
FPS2-3	1	1.28700	1.28700
FPS2-4	1	0.97300	0.97300
TOTAL ALARM LOAD			4.14000

Battery Requirements	
Standby Load	0.06500 X Required Standby Time in Hours = 1.56000
Alarm Load	4.14000 X Required Alarm Time in Hours = 0.34500
Total Amperes Hours (before derating factor)	1.90500
Derating Factor	X
TOTAL AMPERE HOURS REQUIRED	2.28600
BATTERIES TO BE PROVIDED (2 - 12v)	7 AH

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: NAC-1

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 14
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.7 amps
 Total Circuit Current: 1.442 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.079	20.36	0.04	0%
Device 2	0.079	0.25	20.14	0.26	1%
Device 3	0.176	0.30	20.10	0.30	1%
Device 4	0.176	0.37	20.03	0.37	2%
Device 5	0.079	0.39	19.80	0.60	3%
Device 6	0.079	0.83	19.57	0.83	4%
Device 7	0.079	0.43	19.46	1.00	5%
Device 8	0.079	0.36	19.36	1.02	5%
Device 9	0.079	0.23	19.36	1.02	5%
Device 10	0.176	0.17	19.23	1.15	6%
Device 11	0.079	0.13	19.23	1.17	6%
Device 12	0.066	0.13	19.21	1.19	6%
Device 13	0.079	0.19	19.20	1.20	6%
Device 14	0.066	0.19	19.20	1.20	6%
Totals	1.442	262			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: NAC-2

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 14
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.3 amps
 Total Circuit Current: 0.794 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.233	20.33	0.07	0%
Device 2	0.066	0.16	20.24	0.16	1%
Device 3	0.079	0.22	20.15	0.25	1%
Device 4	0.107	0.23	20.07	0.33	2%
Device 5	0.079	0.4	20.06	0.34	2%
Device 6	0.066	0.28	19.99	0.41	2%
Device 7	0.079	0.18	19.95	0.45	2%
Device 8	0.066	0.33	19.90	0.50	2%
Device 9	0.107	0.16	19.88	0.52	3%
Device 10	0.079	0.187	19.88	0.52	3%
Totals	0.794	187			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS1-1

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 25
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 0.775 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.079	0.228	20.28	0.12	1%
Device 2	0.079	0.26	20.26	0.14	1%
Device 3	0.079	0.28	20.13	0.25	1%
Device 4	0.176	0.21	20.01	0.32	2%
Device 5	0.079	0.37	20.00	0.40	2%
Device 6	0.079	0.37	20.00	0.40	2%
Device 7	0.176	0.35	19.96	0.44	2%
Totals	0.775	152			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS1-2

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 25
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.3 amps
 Total Circuit Current: 1.105 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.17	20.23	0.17	1%
Device 2	0.066	0.19	20.11	0.29	1%
Device 3	0.079	0.15	20.02	0.38	2%
Device 4	0.079	0.12	19.95	0.45	2%
Device 5	0.066	0.19	19.86	0.54	3%
Device 6	0.066	0.13	19.84	0.56	3%
Device 7	0.079	0.13	19.79	0.61	3%
Device 8	0.066	0.24	19.70	0.70	3%
Device 9	0.176	0.30	19.60	0.80	4%
Device 10	0.079	0.35	19.52	0.88	4%
Device 11	0.176	0.16	19.50	0.90	4%
Device 12	0.107	0.22	19.48	0.92	4%
Totals	1.105	233			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS1-3

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

Max Output Current: 1.5 amps
 Total Circuit Current: 0.969 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.176	0.107	20.16	0.24	1%
Device 2	0.107	0.41	20.19	0.41	2%
Device 3	0.176	0.49	19.91	0.59	3%
Device 4	0.176	0.33	19.81	0.62	3%
Device 5	0.079	0.15	19.78	0.64	3%
Device 6	0.079	0.11	19.76	0.64	3%
Device 7	0.176	0.19	19.74	0.66	3%
Totals	0.969	172			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS1-4

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 35
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 0.860 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.18	20.22	0.18	1%
Device 2	0.066	0.16	20.05	0.35	2%
Device 3	0.066	0.16	19.99	0.41	2%
Device 4	0.066	0.16	19.94	0.46	2%
Device 5	0.066	0.14	19.84	0.52	3%
Device 6	0.066	0.19	19.88	0.56	3%
Device 7	0.079	0.12	19.84	0.64	3%
Device 8	0.079	0.28	19.71	0.69	3%
Device 9	0.079	0.21	19.68	0.72	4%
Device 10	0.107	0.21	19.66	0.74	4%
Device 11	0.107	0.24	19.66	0.74	4%
Totals	0.860	242			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS2-1

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 30
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 0.696 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.107	20.27	0.13	1%
Device 2	0.107	0.21	20.19	0.21	1%
Device 3	0.176	0.28	20.10	0.30	1%
Device 4	0.079	0.30	20.04	0.36	2%
Device 5	0.079	0.37	20.03	0.37	2%
Device 6	0.176	0.35	19.99	0.41	2%
Totals	0.696	151			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS2-2

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 25
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 1.039 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.19	20.24	0.16	1%
Device 2	0.079	0.15	20.04	0.36	2%
Device 3	0.079	0.16	19.96	0.44	2%
Device 4	0.079	0.12	19.81	0.59	3%
Device 5	0.066	0.24	19.72	0.68	3%
Device 6	0.176	0.30	19.62	0.78	4%
Device 7	0.107	0.29	19.55	0.85	4%
Device 8	0.079	0.29	19.54	0.86	4%
Device 9	0.176	0.36	19.50	0.90	4%
Device 10	0.176	0.36	19.50	0.90	4%
Totals	1.039	236			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS2-3

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 50
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 1.287 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.107	0.40	20.00	0.40	2%
Device 2	0.107	0.54	19.82	0.54	3%
Device 3	0.079	0.58	19.86	0.58	3%
Device 4	0.176	0.75	19.82	0.75	4%
Device 5	0.107	0.33	19.85	0.82	4%
Device 6	0.107	0.82	19.58	0.82	4%
Device 7	0.079	0.85	19.50	0.90	4%
Device 8	0.079	0.90	19.48	0.92	5%
Device 9	0.079	0.94	19.46	0.94	5%
Device 10	0.079	1.0	19.44	0.96	5%
Device 11	0.079	1.0	19.42	0.98	5%
Device 12	0.079	1.2	19.42	0.98	5%
Device 13	0.079	1.2	19.41	0.99	5%
Device 14	0.079	1.2	19.41	0.99	5%
Totals	1.287	202			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS2-4

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 35
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 0.973 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.21	20.19	0.21	1%
Device 2	0.066	0.31	20.09	0.31	2%
Device 3	0.079	0.39	20.01	0.39	2%
Device 4	0.066	0.45	19.95	0.45	2%
Device 5	0.066	0.53	19.87	0.53	3%
Device 6	0.079	0.58	19.74	0.66	3%
Device 7	0.079	0.62	19.64	0.62	4%
Device 8	0.107	0.7	19.58	0.62	4%
Device 9	0.079	0.7	19.56	0.84	4%
Device 10	0.176	0.36	19.53	0.87	4%
Totals	0.973	237			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS2-5

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 25
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 1.039 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.16	20.24	0.16	1%
Device 2	0.066	0.19	20.13	0.27	1%
Device 3	0.079	0.36	20.04	0.36	2%
Device 4	0.079	0.44	19.96	0.44	2%
Device 5	0.079	0.59	19.81	0.59	3%
Device 6	0.066	0.68	19.81	0.68	3%
Device 7	0.066	0.78	19.72	0.78	4%
Device 8	0.176	0.85	19.62	0.78	4%
Device 9	0.107	0.86	19.55	0.85	4%
Device 10	0.079	0.7	19.54	0.86	4%
Device 11	0.176	0.36	19.50	0.90	4%
Totals	1.039	236			

NAC Circuit Voltage Drop Calculation

Project Name: TWO CANAL PLAZA
 Circuit Number: FPS2-6

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16 volts
 Distance from source to 1st device: 14
 Wire Gauge for balance of circuit: 14

Max Output Current: 1.5 amps
 Total Circuit Current: 0.969 amps

Device	Distance previous device	Device Current	Voltage at device	Drop from source	Percent Drop
Device 1	0.066	0.04	20.36	0.04	0%