

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	1		
Area Covered	Basement		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance
Minimum Device Voltage	16	14	Per MFt Cable
Distance to first appliance	50		5.84
Total Circuit Current	1.323		

Wire Gauge for balance of circuit	14	5.84
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Circuit is within limits	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Appliance 1	0.259		20.01	0.39	1.9%
Appliance 2	0.259	50	19.70	0.70	3.4%
Appliance 3	0.078	50	19.47	0.93	4.6%
Appliance 4	0.078	50	19.26	1.14	5.6%
Appliance 5	0.195	50	19.07	1.33	6.5%
Appliance 6	0.078	50	18.93	1.47	7.2%
Appliance 7	0.044	50	18.82	1.58	7.7%
Appliance 8	0.044	50	18.73	1.67	8.2%
Appliance 9	0.078	50	18.64	1.76	8.6%
Appliance 10	0.044	50	18.58	1.82	8.9%
Appliance 11	0.044	50	18.53	1.87	9.2%
Appliance 12	0.044	50	18.50	1.90	9.3%
Appliance 13	0.078	50	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
END	0.000	0	18.47	1.93	9.4%
Totals	1.323	650			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	2		
Area Covered	1ST FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance
Minimum Device Voltage	16	14	Per Mft Cable
Distance to first appliance	50		5.84
Total Circuit Current	1.192		

Wire Gauge for balance of circuit	14	5.84
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	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Circuit is within limits					
Appliance 1	0.078		20.05	0.35	1.7%
Appliance 2	0.078	50	19.73	0.67	3.3%
Appliance 3	0.078	50	19.42	0.98	4.8%
Appliance 4	0.078	50	19.14	1.26	6.2%
Appliance 5	0.078	50	18.89	1.51	7.4%
Appliance 6	0.078	50	18.65	1.75	8.6%
Appliance 7	0.259	50	18.44	1.96	9.6%
Appliance 8	0.064	50	18.31	2.09	10.3%
Appliance 9	0.064	50	18.19	2.21	10.8%
Appliance 10	0.064	50	18.09	2.31	11.3%
Appliance 11	0.195	50	18.01	2.39	11.7%
Appliance 12	0.078	50	17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
END			17.99	2.41	11.8%
Totals	1.192	600			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	3		
Area Covered	1ST FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance
Minimum Device Voltage	16	14	Per Mft Cable
Distance to first appliance	100		5.84
Total Circuit Current	0.620		

Wire Gauge for balance of circuit	14	5.84
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	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Appliance 1	0.078		20.04	0.36	1.8%
Appliance 2	0.044	50	19.88	0.52	2.6%
Appliance 3	0.044	50	19.73	0.67	3.3%
Appliance 4	0.078	50	19.60	0.80	3.9%
Appliance 5	0.044	50	19.49	0.91	4.5%
Appliance 6	0.044	50	19.39	1.01	4.9%
Appliance 7	0.078	50	19.31	1.09	5.3%
Appliance 8	0.044	50	19.25	1.15	5.6%
Appliance 9	0.044	50	19.20	1.20	5.9%
Appliance 10	0.044	50	19.17	1.23	6.1%
Appliance 11	0.078	50	19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
Totals	0.620	600			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	4		
Area Covered	2ND FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance
Minimum Device Voltage	16	14	Per Mft Cable
Distance to first appliance	100		5.84
Total Circuit Current	0.532		

Wire Gauge for balance of circuit	14	5.84
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	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Circuit is within limits					
Appliance 1	0.044		20.09	0.31	1.5%
Appliance 2	0.044	50	19.95	0.45	2.2%
Appliance 3	0.078	50	19.82	0.58	2.9%
Appliance 4	0.044	50	19.71	0.69	3.4%
Appliance 5	0.078	50	19.62	0.78	3.8%
Appliance 6	0.078	50	19.55	0.85	4.2%
Appliance 7	0.044	50	19.50	0.90	4.4%
Appliance 8	0.044	50	19.46	0.94	4.6%
Appliance 9	0.078	50	19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
END			19.44	0.96	4.7%
Totals	0.532	500			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	1		
Area Covered	2ND FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	100		
Total Circuit Current	0.620	14	5.84

Wire Gauge for balance of circuit	14	5.84
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Circuit is within limits	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Appliance 1	0.078		20.04	0.36	1.8%
Appliance 2	0.044	50	19.88	0.52	2.6%
Appliance 3	0.044	50	19.73	0.67	3.3%
Appliance 4	0.078	50	19.60	0.80	3.9%
Appliance 5	0.044	50	19.49	0.91	4.5%
Appliance 6	0.044	50	19.39	1.01	4.9%
Appliance 7	0.078	50	19.31	1.09	5.3%
Appliance 8	0.044	50	19.25	1.15	5.6%
Appliance 9	0.044	50	19.20	1.20	5.9%
Appliance 10	0.044	50	19.17	1.23	6.1%
Appliance 11	0.078	50	19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
END			19.14	1.26	6.2%
Totals	0.620	600			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	2		
Area Covered	3RD FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance Per MFT Cable
Minimum Device Voltage	16		
Distance to first appliance	150		
Total Circuit Current	0.576	14	5.84

Wire Gauge for balance of circuit	14	5.84
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	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Appliance 1	0.044		19.90	0.50	2.5%
Appliance 2	0.044	50	19.74	0.66	3.2%
Appliance 3	0.078	50	19.60	0.80	3.9%
Appliance 4	0.044	50	19.48	0.92	4.5%
Appliance 5	0.078	50	19.37	1.03	5.0%
Appliance 6	0.044	50	19.29	1.11	5.5%
Appliance 7	0.078	50	19.22	1.18	5.8%
Appliance 8	0.044	50	19.17	1.23	6.0%
Appliance 9	0.044	50	19.13	1.27	6.2%
Appliance 10	0.078	50	19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
Totals	0.576	600			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	3		
Area Covered	3RD FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance
Minimum Device Voltage	16	14	Per MFt Cable
Distance to first appliance	150		5.84
Total Circuit Current	0.620		

Wire Gauge for balance of circuit	14	5.84
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Circuit is within limits	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Appliance 1	0.078		19.86	0.54	2.7%
Appliance 2	0.044	50	19.70	0.70	3.4%
Appliance 3	0.044	50	19.55	0.85	4.2%
Appliance 4	0.078	50	19.42	0.98	4.8%
Appliance 5	0.044	50	19.31	1.09	5.3%
Appliance 6	0.044	50	19.21	1.19	5.8%
Appliance 7	0.078	50	19.13	1.27	6.2%
Appliance 8	0.044	50	19.07	1.33	6.5%
Appliance 9	0.044	50	19.02	1.38	6.8%
Appliance 10	0.044	50	18.98	1.42	6.9%
Appliance 11	0.078	50	18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
END			18.96	1.44	7.1%
Totals	0.620	650			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

NAC Circuit Voltage Drop Calculation

Project Name	Longfellow Commons		
Date	1/25/2013		
Circuit Number	4		
Area Covered	4TH FLOOR		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance
Minimum Device Voltage	16	14	Per MFt Cable
Distance to first appliance	150		5.84
Total Circuit Current	0.576		

Wire Gauge for balance of circuit	14	5.84
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Circuit is within limits	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
Appliance 1	0.044		19.90	0.50	2.5%
Appliance 2	0.044	50	19.74	0.66	3.2%
Appliance 3	0.078	50	19.60	0.80	3.9%
Appliance 4	0.044	50	19.48	0.92	4.5%
Appliance 5	0.078	50	19.37	1.03	5.0%
Appliance 6	0.044	50	19.29	1.11	5.5%
Appliance 7	0.078	50	19.22	1.18	5.8%
Appliance 8	0.044	50	19.17	1.23	6.0%
Appliance 9	0.044	50	19.13	1.27	6.2%
Appliance 10	0.078	50	19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
END			19.11	1.29	6.3%
Totals	0.576	600			

Appliance circuit voltage drop calculations start at "end of battery life" as NAC Source Alarm Voltage and use 20% below nameplate rating for Minimum Appliance Voltage.

Note. Wire resistance is based on the 1996 NEC Table 8 Uncoated DC resistance. Solid conductors except gauges 10 and 12 which are for stranded.

Siemens FACP Battery Calculations

Job Name: Longfellow Commons

Date: 1/ 3/13

TOTAL SYSTEM CURRENT	STANDBY	ALARM
	0.553	2.552

TOTAL FACP BATTERY CALCULATIONS			
TOTAL STANDBY CURRENT	A/H REQ'D		A/H STANDBY
0.553 Amps X	24	HRS.	13.267
TOTAL ALARM CURRENT	A/H REQ'D		A/H ALARM
2.552 Amps X	5	MIN.	0.266

Required Battery Capacity	13.533
Always use a battery with higher AH rating than required.	

BATTERY SUPPLIED: 2x18 AH