Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/19/13

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 Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	50	14	5.84
Total Circuit Current	1.323		

Wire Gauge for balance of circuit	14	5.84

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.

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/19/13

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 Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	50	14	5.84
Total Circuit Current	1.192		

Wire Gauge for balance of circuit	14	5.84

Circuit is within limits

	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
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%
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.

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/19/13

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 Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	100	14	5.84
Total Circuit Current	0.620		

Wire Gauge for balance of circuit	14	5.84

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%
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.

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Inspections Division
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Date: 06/19/13

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 Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	100	14	5.84
Total Circuit Current	0.532		

Wire Gauge for balance of circuit	14	5.84

Circuit is within limits

	Device Current	Distance from previous device	Voltage at Device	Drop from source	Percent Drop
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%
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.

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/19/13

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		14	5.84
Total Circuit Current	0.620			

Wire Gauge for balance of circuit	14	5.84

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%
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.

Reviewed for Code Compliance
Inspections Division
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Date: 06/19/13

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	14	5.84
Total Circuit Current	0.576		

Wire Gauge for balance of circuit	14	5.84

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%
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.

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Inspections Division
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Date: 06/19/13

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 Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	150	14	5.84
Total Circuit Current	0.620		

Wire Gauge for balance of circuit	14	5.84

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%
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.

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/19/13

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 Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	150	14	5.84
Total Circuit Current	0.576		

Wire Gauge for balance of circuit	14	5.84

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%
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 Comn

Date: 1/ 3/13

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 06/19/13

	STANDBY
TOTAL SYSTEM CURRENT	**0.553**

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