Approved for Historic Preservation
Certificate of Appropriateness
Date: 06/23/14

rcuit Voltage Drop Calculation

ame	31 Exchange / 46 Market St.		
	5/8/2014		
mber	NAC #1		
Area Covered	Fuji Basement		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance Per MFt Cable
Minimum Device Voltage	16	14	5.84
Distance to first appliance	60		
Total Circuit Current	0.723		
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	0.064		20.15	0.25	1.2%
Appliance 2	0.064	15	20.09	0.31	1.5%
Appliance 3	0.111	40	19.95	0.45	2.2%
Appliance 4	0.131	40	19.84	0.56	2.8%
Appliance 5	0.131	35	19.76	0.64	3.1%
Appliance 6	0.111	40	19.71	0.69	3.4%
Appliance 7	0.111	35	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
END	0.000	0	19.69	0.71	3.5%
Totals	0.723	265			

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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rcuit Voltage Drop Calculation

ame	31 Exchange / 46 Market St.			
	5/8/2014			
mber	NAC #2			
Area Covered	Fuji & 10000 Villages 1st Floor			
NAC Source Alarm Voltage	20.4		Wire Gauge	Resistance Per MFt Cable
Minimum Device Voltage	16			
Distance to first appliance	40		14	5.84
Total Circuit Current	0.788			
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	0.064		20.22	0.18	0.9%
Appliance 2	0.200	35	20.07	0.33	1.6%
Appliance 3	0.131	50	19.91	0.49	2.4%
Appliance 4	0.131	40	19.82	0.58	2.8%
Appliance 5	0.131	35	19.77	0.63	3.1%
Appliance 6	0.131	40	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
END	0.000	0	19.74	0.66	3.2%
Totals	0.788	240			

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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rcuit Voltage Drop Calculation

ame	31 Exchange / 46 Market St.			
	5/8/2014			
mber	NAC #3			
Area Covered	31 Exchange 2nd Floor Suites			
NAC Source Alarm Voltage	20.4		Wire Gauge	Resistance Per MFt Cable
Minimum Device Voltage	16			
Distance to first appliance	20		14	5.84
Total Circuit Current	0.880			
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		20.30	0.10	0.5%
Appliance 2	0.078	35	20.13	0.27	1.3%
Appliance 3	0.064	30	20.01	0.39	1.9%
Appliance 4	0.078	40	19.85	0.55	2.7%
Appliance 5	0.064	30	19.75	0.65	3.2%
Appliance 6	0.064	20	19.69	0.71	3.5%
Appliance 7	0.078	30	19.61	0.79	3.9%
Appliance 8	0.064	30	19.54	0.86	4.2%
Appliance 9	0.078	40	19.47	0.93	4.6%
Appliance 10	0.078	40	19.42	0.98	4.8%
Appliance 11	0.078	40	19.38	1.02	5.0%
Appliance 12	0.078	40	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
END	0.000	0	19.36	1.04	5.1%
Totals	0.880	395			

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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rcuit Voltage Drop Calculation

ame	31 Exchange / 46 Market St.			
	5/8/2014			
mber	NAC #4			
Area Covered	46 Market & 31 Exchange Apartments			
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	0.807			
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	0.195		20.16	0.24	1.2%
Appliance 2	0.195	40	20.02	0.38	1.9%
Appliance 3	0.029	50	19.90	0.50	2.5%
Appliance 4	0.029	35	19.82	0.58	2.8%
Appliance 5	0.029	35	19.75	0.65	3.2%
Appliance 6	0.078	45	19.66	0.74	3.6%
Appliance 7	0.029	40	19.60	0.80	3.9%
Appliance 8	0.029	35	19.56	0.84	4.1%
Appliance 9	0.029	35	19.52	0.88	4.3%
Appliance 10	0.029	50	19.47	0.93	4.6%
Appliance 11	0.029	40	19.44	0.96	4.7%
Appliance 12	0.029	40	19.41	0.99	4.8%
Appliance 13	0.078	40	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
END	0.000	0	19.39	1.01	4.9%
Totals	0.807	535			

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.