Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 07/30/15

NAC Circuit Voltage Drop Calculation

Project Name	**WCSH6**		
Date	**7/13/15**		
Circuit Number	**NAC #1**		
Area Covered	**Basement**		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	25	14	5.84
Total Circuit Current	1.546		

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	0.113		20.17	0.23	1.1%
Appliance 2	0.064	25	19.97	0.43	2.1%
Appliance 3	0.113	40	19.65	0.75	3.7%
Appliance 4	0.195	40	19.35	1.05	5.1%
Appliance 5	0.098	50	19.04	1.36	6.7%
Appliance 6	0.078	40	18.82	1.58	7.8%
Appliance 7	0.064	50	18.56	1.84	9.0%
Appliance 8	0.064	50	18.32	2.08	10.2%
Appliance 9	0.078	35	18.16	2.24	11.0%
Appliance 10	0.078	35	18.03	2.37	11.6%
Appliance 11	0.098	45	17.87	2.53	12.4%
Appliance 12	0.233	50	17.72	2.68	13.1%
Appliance 13	0.064	40	17.66	2.74	13.4%
Appliance 14	0.064	40	17.61	2.79	13.7%
Appliance 15	0.078	50	17.57	2.83	13.9%
Appliance 16	0.064	35	17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
END			17.55	2.85	13.9%
Totals	1.546	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.

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NAC Circuit Voltage Drop Calculation

Project Name	WCSH6		
Date	7/13/15		
Circuit Number	NAC #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	1.085		

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		20.08	0.32	1.6%
Appliance 2	0.259	75	19.64	0.76	3.7%
Appliance 3	0.113	75	19.30	1.10	5.4%
Appliance 4	0.259	75	19.02	1.38	6.8%
Appliance 5	0.195	75	18.85	1.55	7.6%
Appliance 6	0.195	75	18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
END			18.76	1.64	8.0%
Totals	1.085	425			

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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NAC Circuit Voltage Drop Calculation

Project Name	WCSH6		
Date	7/13/15		
Circuit Number	NAC #3		
Area Covered	2nd 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	0.978		

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		20.11	0.29	1.4%
Appliance 2	0.259	60	19.80	0.60	2.9%
Appliance 3	0.078	40	19.65	0.75	3.7%
Appliance 4	0.064	40	19.52	0.88	4.3%
Appliance 5	0.195	50	19.37	1.03	5.0%
Appliance 6	0.098	35	19.31	1.09	5.3%
Appliance 7	0.064	35	19.27	1.13	5.5%
Appliance 8	0.064	35	19.24	1.16	5.7%
Appliance 9	0.078	35	19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
END			19.22	1.18	5.8%
Totals	0.978	380			

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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NAC Circuit Voltage Drop Calculation

Project Name	WCSH6		
Date	7/13/15		
Circuit Number	NAC #4		
Area Covered	3rd Floor		
NAC Source Alarm Voltage	20.4	Wire Gauge	Resistance Per MFt Cable
Minimum Device Voltage	16		
Distance to first appliance	75	14	5.84
Total Circuit Current	0.796		

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	0.064	50	19.84	0.56	2.7%
Appliance 3	0.195	60	19.61	0.79	3.9%
Appliance 4	0.175	75	19.41	0.99	4.8%
Appliance 5	0.078	40	19.35	1.05	5.2%
Appliance 6	0.064	40	19.30	1.10	5.4%
Appliance 7	0.064	35	19.27	1.13	5.5%
Appliance 8	0.078	35	19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
END			19.25	1.15	5.6%
Totals	0.796	410			

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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NAC Circuit Voltage Drop Calculation

Project Name	WCSH6		
Date	7/13/15		
Circuit Number	NAC #5		
Area Covered	4th 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	0.866		

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		19.89	0.51	2.5%
Appliance 2	0.064	40	19.71	0.69	3.4%
Appliance 3	0.195	30	19.58	0.82	4.0%
Appliance 4	0.195	50	19.43	0.97	4.8%
Appliance 5	0.064	50	19.33	1.07	5.2%
Appliance 6	0.064	50	19.25	1.15	5.6%
Appliance 7	0.064	60	19.18	1.22	6.0%
Appliance 8	0.064	35	19.15	1.25	6.1%
Appliance 9	0.078	35	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%
END			19.14	1.26	6.2%
Totals	0.866	450			

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.