NAC Circuit Voltage Drop Calculation								
Bank Mills III								
Project Name		Longfellow Commons						
Date		1/25/2013						
Circuit Numbe	Γ	1						
Area Covered		Basement						
NAC Source A	**	20.4		Wire	Resistance			
Minimum Devi	-	16		Gauge	Per MFt Cable			
Distance to fire		50		14	5.84			
Total Circuit C	urrent	1.323						
Wire Gauge fo	or balance of c	ircuit		14	5.84			
		Distance	:					
Circuit is with	ıln ilmits	from						
	Device	previous	Voltage at	Drop from	Percent			
	Current	device	Device	source	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 18.50	1.87 1.90	9.2% 9.3%			
Appliance 12	0.044	50						
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%			
END	0.000	0	18.47	1.93	9.4%			
Totals	1.323	650	-					

NAC Circuit Voltage Drop Calculation									
Project Name		Longfellow Commons							
Date		1/25/2013							
Circuit Numbe	r	2							
Area Covered		1ST FLOOR							
NAC Source A	_	20.4		Wire	Resistance				
Minimum Devi	•	16		Gauge	Per MFt Cable				
Distance to fire		50		14	5.84				
Total Circuit C	urrent	1.192							
Mina Causa fa	v balance of si	ina. ils		14	5.84				
Wire Gauge fo	or balance of ci	Distance		14	3.04				
Circuit is with	sin limita	from							
Circuit is with	Device	previous	Voltago et	Drop from	Percent				
		device	Voltage at Device	•	Drop				
Annlianas 1	Current 0.078	1	20.05	source 0.35	1.7%				
Appliance 1 Appliance 2	0.078	50	19.73	0.33	3.3%				
Appliance 3	0.078	50	19.73	0.07	4.8%				
	0.078	50	19.42	1.26	6.2%				
Appliance 4	0.078	50	18.89	1.20	7.4%				
Appliance 5	0.078	50	18.65	1.75	8.6%				
Appliance 6 Appliance 7	0.078	50	18.44	1.75	9.6%				
	0.259	50	18.31	2.09	10.3%				
Appliance 8 Appliance 9	0.064	50	18.19	2.09	10.8%				
	0.064	50	18.09	2.21	11.3%				
Appliance 10 Appliance 11	0.004	50	18.09	2.31	11.7%				
		50	17.99	2.3 9 2.41	11.8%				
Appliance 12 END	0.078	30	17.99	2. 4 1 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%				
		A STATE		2.41					
END			17.99		11.8%				
END END			17.99	2.41 2.41	11.8%				
			17.99 17.00		11.8%				
END		 	17.99	2.41	11.8%				
END			17.99	2.41	11.8%				
END Totals	1 100		17.99	2.41	11.8%				
Totals	1.192	600							

NAC Circuit Voltage Drop Calculation								
Project Name		Longfellow C	ommons					
Date		Longfellow Commons 1/25/2013						
Circuit Numbe	r	3		1				
Area Covered	•	1ST FLOOR						
NAC Source A	Jarm Voltage	20.4		Wire	Resistance			
Minimum Devi	•	16		Gauge	Per MFt Cable			
Distance to fire	•	100		14	5.84			
Total Circuit C		0.620			3,3 .			
Wire Gauge fo	or balance of ci	ircuit		14	5.84			
-		Distance						
Circuit is with	nin limits	from						
	Device	previous	Voltage at	Drop from	Percent			
	Current	device	Device	source	Drop			
Appliance 1	0.078		20.04	0.36	1.8%			
Appliance 2	Appliance 2 0.044		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%			
Totals	Totals 0.620 600							

NAC Circuit Voltage Drop Calculation									
Droinat Nama		Longfallow C							
Project Name Date		Longfellow Commons							
Circuit Numbe	۳	1/25/2013							
Area Covered	1	4							
NAC Source A	lorm Voltage	20.4	***	Wire	Resistance				
	_	16		Gauge	Per MFt Cable				
Minimum Devi	_	100		14	5.84				
Distance to fire Total Circuit C		0.532		1-4	J.04				
Total Circuit C	unent	0.552							
Wire Gauge fo	or balance of ci	rcuit		14	5.84				
	.,	Distance							
Circuit is with	nin limits	from							
	Device	previous	Voltage at	Drop from	Percent				
	Current	device	Device	source	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		1.	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		3.96 (19.3	19.44	0.96	4.7%				
END		A. (1.11)	19.44	0.96	4.7%				
END		A to the total	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							

Project Name	MAGO: "V" B O L L "									
Date	NAC CIrcui	t voitage D	rop Calcula	tion						
Date	Project Name		Longfellow C	ommone						
Circuit Number										
Area Covered NAC Source Alarm Voltage NAC Source Alarm Voltage 20.4		r								
NAC Source Alarm Voltage Minimum Device Voltage Distance to first appliance 20.4 Wire Gauge Total Circuit Current Resistance Per MFt Cable 14 S.84 Wire Gauge for balance of circuit Distance Circuit is within limits Device previous Previous Voltage at Drop from Device Source Drop Percent Drop From Percent Device Source 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%		i.	•							
Minimum Device Voltage 16 Gauge Per MFt Cable Distance to first appliance 100 14 5.84 Total Circuit Current 0.620 Wire Gauge for balance of circuit 14 5.84 Distance Circuit is within limits from Device previous Current device Voltage at Drop from Percent Device source 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%		Jarm Voltago								
Distance to first appliance		_	1)				
Total Circuit Current 0.620		•			- :	l l				
Wire Gauge for balance of circuit 14 5.84 Distance Circuit is within limits From Device previous Previous Device previous Previous Device previous Device Source 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%		7 7			14	5.04				
Distance From Device D	Total Circuit C	urrent	0.620							
Circuit is within limits Device previous Voltage at Drop from Percent Current device Device source 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%	Wire Gauge fo	or balance of ci	rcuit		14	5.84				
Device Current previous device Voltage at Drop from Source Percent Drop Appliance 1 Appliance 2 Appliance 3 Appliance 3 Appliance 4 Appliance 4 Appliance 5 Appliance 5 Appliance 6 Appliance 6 Appliance 6 Appliance 7 Appliance 7 Appliance 7 Appliance 8 0.044 SO										
Current device Device source 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%	Circuit is with	nin limits	from							
Current device Device source 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%			previous	Voltage at	Drop from	Percent				
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%		Current	•	_	•	Drop				
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 1]	20.04	0.36	•				
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%	, ,	0.044	50	19.88						
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%	1 1		50	19.73	0.67	3.3%				
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%			50	19.60	0.80	3.9%				
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%	• •			19.49	0.91					
Appliance 7 0.078 50 19.31 1.09 5.3% Appliance 8 0.044 50 19.25 1.15 5.6%	• •									
Appliance 8 0.044 50 19.25 1.15 5.6%		0.078	50	19.31	1.09					
		0.044	50	19.25	1.15	5.6%				
		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%		11. A								
END 19.14 1.26 6.2%										
END 19.14 1.26 6.2%										
END 19.14 1.26 6.2%	END	1								
END 19.14 1.26 6.2%										
END 19.14 1.26 6.2%			1.50							
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		0.620	600			2				

NAC Circuit Voltage Drop Calculation								
Draiget Name								
Project Name		Longfellow Commons						
Date	_	1/25/2013		1				
Circuit Numbe	Г	2 PD 51 00D						
Area Covered	James Valtaga	3RD FLOOR 20.4		Wire	Resistance			
NAC Source A	_			1 1	Per MFt Cable			
Minimum Devi	-	16		Gauge				
Distance to fire	• •	150		14	5.84			
Total Circuit C	urrent	0.576						
Wire Gauge fo	or balance of ci	ircuit		14	5.84			
		Distance						
Circuit is with	nin limits	from						
	Device	previous	Voltage at	Drop from	Percent			
	Current	device	Device	source	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		1	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		1.	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						

NAC Circuit Voltage Drop Calculation									
INAC CITCUI	t voltage D	TOP Calcula	LIOII						
Project Name		Longfellow C	ommons						
Date		1/25/2013	1/25/2013						
Circuit Numbe	r	3							
Area Covered		3RD FLOOR							
NAC Source A	larm Voltage	20.4	<u> </u>	Wire	Resistance				
Minimum Devi	ce Voltage	16		Gauge	Per MFt Cable				
Distance to fire	st appliance	150		14	5.84				
Total Circuit C	urrent	0.620							
Wire Gauge fo	or balance of ci	ircuit		14	5.84				
		Distance							
Circuit is with	nin limits	from							
	Device	previous	Voltage at	Drop from	Percent				
	Current	device	Device	source	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	4		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%				

650

0.620

Totals

NAC Circui	t Voltage D	rop Calcula	tion		
Project Name		Longfellow C	ommons		·
Date		1/25/2013			
Circuit Numbe	r	4			
Area Covered		4TH FLOOR		· · · · · · · · · · · · · · · · · · ·	
NAC Source A	larm Voltage	20.4		Wire	Resistance
Minimum Devi		16		Gauge	Per MFt Cable
	-	150		14	5.84
Distance to first appliance Total Circuit Current		0.576			
Wire Gauge fo	r balance of c	ircuit		14	5.84
•		Distance	•		
Circuit is with	in limits	from			
	Device	previous	Voltage at	Drop from	Percent
	Current	device	Device	source	Drop
Appliance 1	0.044		19.90	0.50	2.5%
Appliance 2			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	-		

Siemens FACP Battery Calculations

Job Name: Longfellow Commons

Date: 1/ 3/13

STANDBY

ALARM

TOTAL SYSTEM CURRENT

0.553

2.552

production (C	TOTAL FA	CP BAT	TERY CALCU	JLATIONS		
					A (II OTANDE)	24
TOTAL STA	ANDBY CURRENT 0.553 Amps X	A/H RE0 24	Q'D HRS.		A/H STANDBY 13.267	
The mail of fact of	0.000 Amps A	24	TINO.		10.201	
TOTAL ALA	RM CURRENT	A/H REC	λ'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