NOTIFICATION APPLIANCE CIRCUITS VOLTAGE DROP CALCULATIONS

VOLTAGE DROP CALCULATIONS: CIRCUIT V13

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V13–1	0.079	0.079	50	100	14	3.26	0.0258
V13–2	0.052	0.131	15	30	14	3.26	0.0128
V13–3	0.079	0.21	40	80	14	3.26	0.0548
V13–4	0.148	0.358	40	80	14	3.26	0.0934
V13–5	0.079	0.437	25	50	14	3.26	0.0712
V13–6	0.052	0.489	35	70	14	3.26	0.1116
V13–7	0.148	0.637	50	100	14	3.26	0.2077
V13–8	0.148	0.785	285	570	14	3.26	1.4587
	Total Load:	0.785	10	20		Total V–Drop	2.0359

21.9641 VOLTS REMAINING (within the voltage range of the appliances)
0.785 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V14

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V14–1	0.148	0.148	60	120	14	3.26	0.0579
V14–2	0.079	0.227	75	150	14	3.26	0.1110
V14–3	0.079	0.306	50	100	14	3.26	0.0998
V14–4	0.052	0.358	30	60	14	3.26	0.0700
V14–5	0.052	0.41	40	80	14	3.26	0.1069
V14–6	0.079	0.489	70	140	14	3.26	0.2232
V14–7	0.079	0.568	50	100	14	3.26	0.1852
V14–8	0.178	0.746	335	670	14	3.26	1.6294
	Total Load:	0.746	10	20		Total V–Drop	2.4834

21.5166 VOLTS REMAINING (within the voltage range of the appliances)
0.746 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V15

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V15–1	0.052	0.052	50	100	14	3.26	0.0170
V15–2	0.052	0.104	50	100	14	3.26	0.0339
V15–3	0.148	0.252	35	70	14	3.26	0.0575
V15–4	0.148	0.4	45	90	14	3.26	0.1174
V15–5	0.148	0.548	40	80	14	3.26	0.1429
V15–6	0.178	0.726	45	90	14	3.26	0.2130
V15–7	0.052	0.778	345	690	14	3.26	1.7500
	Total Load:	0.778	10	20		Total V–Drop	2.3317

21.6683 VOLTS REMAINING (within the voltage range of the appliances)
0.778 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V16

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V16–1	0.148	0.148	25	50	14	3.26	0.0241
V16–2	0.079	0.227	30	60	14	3.26	0.0444
V16–3	0.148	0.375	25	50	14	3.26	0.0611
V16–4	0.052	0.427	15	30	14	3.26	0.0418
V16–5	0.148	0.575	70	140	14	3.26	0.2624
V16–6	0.148	0.723	30	60	14	3.26	0.1414
V16–7	0.148	0.871	315	630	14	3.26	1.7889
	Total Load:	0.871	10	20		Total V–Drop	2.3641

21.6359 VOLTS REMAINING (within the voltage range of the appliances)
0.871 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V17

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V17–1	0.079	0.079	70	140	14	3.26	0.0361
V17–2	0.079	0.158	45	90	14	3.26	0.0464
V17–3	0.052	0.21	30	60	14	3.26	0.0411
V17–4	0.052	0.262	25	50	14	3.26	0.0427
V17–5	0.079	0.341	100	200	14	3.26	0.2223
V17–6	0.079	0.42	55	110	14	3.26	0.1506
V17–7	0.178	0.598	200	400	14	3.26	0.7798
V17–8	0.052	0.65	385	770	14	3.26	1.6316
	Total Load:	0.65				Total V–Drop	2.9506

21.0494 VOLTS REMAINING (within the voltage range of the appliances)
0.65 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V18

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V18–1	0.178	0.178	40	80	14	3.26	0.0464
V18–2	0.178	0.356	55	110	14	3.26	0.1277
V18–3	0.178	0.534	95	190	14	3.26	0.3308
V18–4	0.178	0.712	340	680	14	3.26	1.5784
	Total Load:	0.712				Total V–Drop	2.0832

21.9168 VOLTS REMAINING (within the voltage range of the appliances)
0.712 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V19

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V19–1	0.178	0.178	60	120	14	3.26	0.0696
V19–2	0.178	0.356	70	140	14	3.26	0.1625
V19–3	0.052	0.408	100	200	14	3.26	0.2660
V19–4	0.052	0.46	340	680	14	3.26	1.0197
	Total Load:	0.46				Total V–Drop	1.5179

22.4821 VOLTS REMAINING (within the voltage range of the appliances)
0.46 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

VOLTAGE DROP CALCULATIONS: CIRCUIT V20

Voltage Drop = (L/1000)(A)(R)
Where:
L = Conductor Distance (twice actual distance)
A = Load (amps)
R = Resistance per 1,000 ft (NEC table 9)

Appliance Type	Appliance Load (amps)	Cummulative Load (amp)	Actual Distance (ft)	Conductor Distance (ft)	Conductor Gauge	Resistance per 1,000 ft	Voltage Drop
V20–1	0.079	0.079	70	140	14	3.26	0.0361
V20–2	0.052	0.131	60	120	14	3.26	0.0512
V20–3	0.148	0.279	45	90	14	3.26	0.0819
V20–4	0.052	0.331	65	130	14	3.26	0.1403
V20–5	0.178	0.509	75	150	14	3.26	0.2489
V20–6	0.178	0.687	400	800	14	3.26	1.7917
	Total Load:	0.687				Total V–Drop	2.3500

21.6500 VOLTS REMAINING (within the voltage range of the appliances)
0.687 TOTAL AMPS REQUIRED (within the listed power supply output)

NOTIFICATION APPLIANCES:

TYPE	MAKE	MODEL	CANDELA	LOAD	V–RANGE	NOTE
STROBE	WHEELOCK	NS4	15	0.052	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	30	0.079	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	75	0.148	16–33	MULTI CANDELA
STROBE	WHEELOCK	NS4	110	0.178	16–33	MULTI CANDELA

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD): AS BUILT 06/14/13

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
–	DSV	LDD	MCD	6/14/13	AS BUILT PER FIELD VERIFICATION

BLDG–67 FIRE ALARM
VOLTAGE DROP CALCULATION

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

		DATE
DRAWN BY	DSV	06/14/2013
CHECKED BY	LDD	7/8/2013
APPROVED BY	MCD	7/8/2013
SCALE		

DRAWING NO. 4B67E150
PROJECT NO. FN1438
SHEET 3 OF 21