NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV2 – 45 DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd			
WHEELOCK HORN/STROBE 15cd			
WHEELOCK STROBE 30 cd			
WHEELOCK HORN/STROBE 30 cd			
WHEELOCK STROBE 75 cd			
WHEELOCK HORN/STROBE 75 cd			
WHEELOCK STROBE 110 cd			
WHEELOCK HORN/STROBE 110 cd	2	0.307	0.614
WHEELOCK HORN			
AUTOCALL BELL			
TOTAL NOTIFICATION APPLIANCES CURRENT			0.614

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM

WHERE: I = CIRCUIT CURRENT

D = CONDUCTOR LENGTH (FT) ONE WAY

21.6 = CONSTANT

CM = CROSS-SECTIONAL AREA OF WIE (CIRCULAR MILS)

VD = {(0.614A) (160FT) (21.64)}/4110 = 0.516V

%VD = {0.516V / 24V} X 100 = 2.151%

REMAINING VOLTS = 23.484

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

FACU POWER SUPPLY & BATTERY FAP-001-48 (MXL) – 12 AMP

SUPERVISORY CURRENT

DESCRIPTION	QUANTITY	MODULE CURRENT	EOL CURRENT	DEVICE CURRENT	TOTAL ROW CURRENT
MMB-1/2	1	0.175	0.024	0.132	0.331
MKB-2	1	0.005	NA	NA	0.005
TSP-40	1	0.070	NA	NA	0.070
CRM-4	1	0.015	NA	NA	0.015
CZM-4	3	0.055	NA	0.013	0.204
NET-7	1	0.030	NA	NA	0.030
NIM-1W	2	0.150	NA	NA	0.300
D2300CP	2	0.050	NA	NA	0.100
PSA-5	1	***	NA	NA	0.264
*** 25% OF 24V LOAD			TOTAL SUPERVISORY CURRENT		1.319

ALARM CURRENT

MXLR OCCUPANT NOTIFICATION APPLIANCE CIRCUITS	TOTAL CIRCUIT CURRENT LOAD
HORNS	0.348
STROBE 110cd	0.660
HORN/STROBE 110cd	0.614
TOTAL ALARM CURRENT	1.622

SUMMARY

MINIMUM BATTERY CAPACITY = {TOTAL STANDBY CURRENT X STANDBY TIME} + {TOTAL ALARM CURRENT X ALARM TIME} X 1.25

MINIMUM BATTERY CAPACITY = {1.319 X 24 HR} + {1.622 X 0.083 HR} X 1.25 =

MINIMUM BATTERY CAPACITY = {31.656 AHR + 0.135 AHR} X 1.25 = 39.738 AHR

FIRE ALARM SYSTEM FUNCTION CHART

SYSTEM EVENT	RESPONSE: ANNUNCIATE AT FACU	FIRE SIGNAL TO RECEIVER	TROUBLE SIGNAL TO LBNL RECEIVER	SUPERVISORY SIGNAL TO LBNL RECEIVER	OPERATE NOTIFICATION APPLIANCES
B43 FIRE CALL BOX	●	●			●
B43 FIRE SPRINKLER WATERFLOW SWITCH	●	●			●
B43 FIRE SPRINKLER VALVE SUPERVISORY SWITCH	●			●	
B45 FIRE SPRINKLER WATERFLOW SWITCH	●	●			●
B45 FIRE SPRINKLER VALVE SUPERVISORY SWITCH	●			●	
B48 SMOKE DETECTOR	●	●			●
B48 FIRE SPRINKLER WATERFLOW SWITCH	●	●			●
B48 FIRE SPRINKLER VALVE SUPERVISORY SWITCH	●	●		●	
AC POWER FAILURE	●		●		
SYSTEM FAULT	●		●		

NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1 – 48 1ST & 2ND FLOORS DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd			
WHEELOCK HORN/STROBE 15cd			
WHEELOCK STROBE 30 cd			
WHEELOCK HORN/STROBE 30 cd			
WHEELOCK STROBE 75 cd			
WHEELOCK HORN/STROBE 75 cd			
WHEELOCK STROBE 110 cd	3	0.220	0.660
WHEELOCK HORN/STROBE 110 cd			
WHEELOCK HORN	4	0.087	0.348
AUTOCALL BELL			
TOTAL NOTIFICATION APPLIANCES CURRENT			1.008

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM

WHERE: I = CIRCUIT CURRENT

D = CONDUCTOR LENGTH (FT) ONE WAY

21.6 = CONSTANT

CM = CROSS-SECTIONAL AREA OF WIE (CIRCULAR MILS)

VD = {(1.008A) (100FT) (21.64)}/4110 = 0.53V

%VD = {0.53V / 24V} X 100 = 2.207%

REMAINING VOLTS = 23.470

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

NOTIFICATION APPLIANCE CIRCUIT CURRENTS

CKT AV1	48 1ST & 2ND FLOORS	1.008
CKT AV2	45	0.614
CKT AV3	–	–
CKT AV4	–	–
CKT AV5	–	–
CKT AV6	–	–
CKT AV7	–	–
CKT AV8	–	–
	TOTAL NOTIFICATION APPLIANCES CURRENT	1.622

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)	ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)	REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
	AS BUILT – – 09/17/13	_	LDD	LDD	MCD	09/17/13	AS BUILT

BLDG 48, 43, 45 FIRE ALARM FUNCTION CHART & CALCULATIONS

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UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWN BY	LDD	DATE 09/17/2013
CHECKED BY	LDD	09/17/2013
APPROVED BY	MCD	09/17/2013
SCALE	AS NOTED	
DRAWING NO.	4B48E080_	SHEET 1 OF 1
PROJECT NO.	000000	