BATTERY CALCULATIONS
FAP–001–68

ITEM	DESCRIPTION	QTY	STANDBY CURRENT PER ITEM (AMPS)	TOTAL STANDBY CURRENT PER ITEM	ALARM CURRENT PER ITEM (AMPS)	TOTAL ALARM CURRENT PER ITEM
CP–35	FACP w/2ZN'S + AUD	1	0.1750	0.1750	0.5010	0.5010
PS–35	POWER SUPPLY	1	0.0000	0.0000	0.0000	0.0000
BC–35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
PM–32	SWITCH MODULE	1	0.0000	0.0000	0.0000	0.0000
SM–30	SWITCH MODULE	1	0.0000	0.0000	0.0450	0.0450
SR–35	8 RELAY MODULE	1	0.0000	0.0000	0.0210	0.0210
ZN–34US	SUPERVISORY MODULE	6	0.0100	0.0600	0.1100	0.6600
ZU–35	ZONE MODULE	1	0.0090	0.0090	0.1100	0.1100
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	1	0.0020	0.0020	0.0000	0.0000
PS–5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						0.2700
	TOTAL SYSTEM CURRENT		STANDBY	0.4490	ALARM	1.8120

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) + (TOT. ALARM CURRENT X ALARM TIME)} X 1.25

MIN. BATTERY CAPACITY = {(0.449 A X 24 HR) + (1.8120 A X 0.083 HR)} X 1.25

MIN. BATTERY CAPACITY = {10.776 AHr + 0.1504 AHr} X 1.25 = 13.658 AHr

NOTIFICATION APPLIANCE CIRCUIT
VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1 DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd	–	0.5010	0.0000
WHEELOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELOCK STROBE 30 cd	–	0.0300	0.0000
WHEELOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELOCK STROBE 75 cd	–	0.0210	0.0000
WHEELOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELOCK STROBE 110 cd	–	0.1100	0.0000
WHEELOCK HORN/STROBE 110 cd	–	0.1750	0.0000
WHEELOCK HORN	–	0.0000	0.0000
AUTOCALL BELL	–	0.0000	0.0000
BELL/STROBE 110 cd	1	0.2700	0.2700
TOTAL NOTIFICATION APPLIANCES CURRENT			0.2700

VOLTAGE DROP (VD) CALCULATIONS

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

WHERE: I = CIRCUIT CURRENT

D = CONDUCTOR LENGTH (FT) ONE WAY

21.6 = A CONSTANT

CM = CIRCULAR MILS

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

VD = {(0.27A) (10FT) (21.64)}/4110 = 0.014V

%VD = {0.014V / 24V} X 100 = 0.059% REMAINING VOLTS = 23.986

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
FIRE CALL BOX	●	●			●
SD @ FACP	●	●			●
FIRE SPRINKLER WATERFLOW SWITCH	●	●			●
PUMP CONTROLLER NOT IN AUTO	●		●		
POWER FAILURE – PUMP CONTROLLER	●		●		
REMOTE START SIGNAL RECEIVED	●		●		
FIRE PUMP RUNNING	●		●		
COMMON ENGINE TROUBLE	●		●		
DIESEL FUEL LEVEL – LOW	●		●		
CIRCULATING PUMP TROUBLE	●		●		
TANK WATER LEVEL – LOW	●		●		
TANK WATER LEVEL – HIGH	●		●		
TANK WATER LEVEL – EMPTY	●		●		
TANK VALVE SUPERVISROY SWITCHES (5)	●			●	
AC POWER FAILURE	●		●		
SYSTEM FAULT	●				

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

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD): AS BUILT — 09/09/13

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
_	LDD	LDD	MCD	09/09/13	AS BUILT

BLDG 68 FIRE ALARM
FUNCTION CHART & CALCULATIONS
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DRAWN BY	LDD	DATE 09/09/2013
CHECKED BY	LDD	09/09/2013
APPROVED BY	MCD	09/09/2013
SCALE	AS NOTED	

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWING NO. 4B68E008_ — SHEET FA1 — 1 OF 3

PROJECT NO. 000000