NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV2 – BLDG 35 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	1	0.0500	0.0500
TOTAL NOTIFICATION APPLIANCES CURRENT			0.0500

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT CURRENT
D = CONDUCTOR LENGTH (FT) ONE WAY
21.6 = CONSTANT
CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)

VD = {(0.05A) (300FT) (21.64)}/4110 = 0.079V
%VD = {0.079V / 24V} X 100 = 0.328%
REMAINING VOLTS = 23.921

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

NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV3 – BLDG 37 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	4	0.0500	0.2000
TOTAL NOTIFICATION APPLIANCES CURRENT			0.2000

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT CURRENT
D = CONDUCTOR LENGTH (FT) ONE WAY
21.6 = CONSTANT
CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)

VD = {(0.2A) (150FT) (21.64)}/4110 = 0.158V
%VD = {1.58V / 24V} X 100 = 0.657%
REMAINING VOLTS = 23.842

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

BATTERY CALCULATIONS FAP–001–37

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	2	0.0000	0.0000	0.0000	0.0000
BC–35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
AA–30U	CLASS B BELL MODULE	2	0.0065	0.0130	0.0400	0.0800
SM–30	SWITCH MODULE	2	0.0000	0.0000	0.0450	0.0900
SR–30	2 RELAY MODULE	2	0.0000	0.0000	0.0450	0.0900
SR–33	11 RELAY MODULE	1	0.0000	0.0000	0.0060	0.0060
SR–35	8 RELAY MODULE	1	0.0000	0.0000	0.0210	0.0210
TC–30U	BATTERY TRANSFER	1	0.0300	0.0300	0.0150	0.0150
ZN–34US	SUPERVISORY MODULE	4	0.0100	0.0400	0.1100	0.4400
ZU–35	ZONE MODULE	2	0.0090	0.0180	0.1100	0.2200
ZU–35DS	ZONE MODULE/SD's	2	0.0090	0.0180	0.1100	0.2200
SMOKE	SMOKE DETECTOR	4	0.0001	0.0004	0.0010	0.0040
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	2	0.0020	0.0040	0.0000	0.0000
PS–5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						1.6000
TOTAL SYSTEM CURRENT			STANDBY	0.5014	ALARM	4.4920

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) + (TOT. ALARM CURRENT X ALARM TIME)} X 1.25
MIN. BATTERY CAPACITY = {(0.5014A X 24 HR) + (4.492 A X 0.083 HR)} X 1.25
MIN. BATTERY CAPACITY = {12.0336 AHr + 0.3728 AHr} X 1.25 = 15.508 AHr

NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1 – BLDG 34 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/STROBE	5	0.2700	1.3500
TOTAL NOTIFICATION APPLIANCES CURRENT			1.3500

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT CURRENT
D = CONDUCTOR LENGTH (FT) ONE WAY
21.6 = CONSTANT
CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)

VD = {(1.35A) (400FT) (21.64)}/4110 = 2.838V
%VD = {2.838V / 24V} X 100 = 11.825%
REMAINING VOLTS = 21.162

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

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 B34 NOTIFICATION APPLIANCES	OPERATE B35 NOTIFICATION APPLIANCES	OPERATE B37 NOTIFICATION APPLIANCES
B34 FIRE CALL BOX	●	●			●		
B34 SMOKE DETECTOR	●	●			●		
B34 FIRE SPRINKLER WATERFLOW SWITCH	●	●			●		
B34 FIRE SPRINKLER SUPERVISORY SWITCH	●			●			
B35 FIRE CALL BOX	●	●				●	
B35 SMOKE DETECTOR	●	●				●	
B37 FIRE CALL BOX	●	●					●
B37 FIRE SPRINKLER WATERFLOW SWITCH	●	●					●
B37 FIRE SPRINKLER SUPERVISORY SWITCH	●			●			
AC POWER FAILURE	●		●				
SYSTEM FAULT	●		●				

NOTIFICATION APPLIANCE CIRCUIT CURRENTS

CKT AV1	BLDG 34	1.350
CKT AV2	BLDG 35	0.050
CKT AV3	BLDG 36	0.200
CKT AV4	–	–
CKT AV5	–	–
CKT AV6	–	–
CKT AV7	–	–
CKT AV8	–	–
	TOTAL NOTIFICATION APPLIANCES CURRENT	1.600

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

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD): AS BUILT – – 09/16/13

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
–	LDD	LDD	MCD	09/16/13	AS BUILT

BLDG 37 (34 & 35) FIRE ALARM FUNCTION CHART & CALCULATIONS

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UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWN BY	LDD	DATE 9/16/2013
CHECKED BY	LDD	09/16/2013
APPROVED BY	MCD	09/16/2013
SCALE	AS NOTED	
DRAWING NO.	4B37E064_	SHEET 1 OF 1
PROJECT NO.	000000	