NOTIFICATION APPLIANCE CIRCUIT POWER REQUIREMENTS – 1ST FLOOR

DESCRIPTION	CURRENT PER APPLIANCE	# OF APPLIANCES CIRCUIT AV1	CIRCUIT AV2	CIRCUIT AV3
WHEELOCK HORN/STROBE 15 cd	0.066	3	2	0
WHEELOCK HORN/STROBE 30 cd	0.101	1	1	3
WHEELOCK HORN/STROBE 75 cd	0.177	2	1	0
WHEELOCK HORN/STROBE 110 cd	0.232	1	2	3
WHEELOCK STROBE 15 cd	0.060	0	1	0
TOTAL CIRCUIT CURRENT		0.885	0.934	0.999

NOTES:

THE FOLLOWING NOTIFICATION APPLIANCES AND THEIR POWER DEMANDS WERE USED IN THE DESIGN:

1. WHEELOCK INC. HS4-24MCW; 15CD WALL MOUNTED HORN/STROBE; 0.066 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP
2. WHEELOCK INC. SERIES HS4-24MCW; 30CD WALL MOUNTED HORN/STROBE; 0.101 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP
3. WHEELOCK INC. SERIES HS4-24MCW; 75CD WALL MOUNTED HORN/STROBE; 0.177 AMP MAX UL POWER REMAND; RATED 16 TO 33 AMP
4. WHEELOCK INC. SERIES HS4-24MCW; 110CD WALL MOUNTED HORN/STROBE; 0.232 AMP MAX UL POWER REMAND; RATED 16 TO 33 AMP
5. WHEELOCK INC. SERIES HS4-24MCW; 15CD WALL MOUNTED STROBE; 0.060 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP

VOLTAGE DROP CALCULATIONS

{(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT POWER LOAD
D = CONDUCTOR ONE WAY DISTANCE
21.6 = CONSTANT
CM = CROSS SECTION AREA OF WIRE (4110 FOR AWG#14)

NAC AV1
{0.885 AMP) (500 FT) (21.64)}/4110 VOLTAGE DROP: 2.330 VOLTS AVAILABLE VOLTAGE: 21.670 VOLTS

NAC AV2
{0.934 AMP) (500 FT) (21.64)}/4110 VOLTAGE DROP: 2.459 VOLTS AVAILABLE VOLTAGE: 21.541 VOLTS

NAC AV3
{0.999 AMP) (500 FT) (21.64)}/4110 VOLTAGE DROP: 2.626 VOLTS AVAILABLE VOLTAGE: 21.374 VOLTS

THE CIRCUIT'S AVAILABLE VOLTAGE IS ABOVE THE MINIMUM LISTED VOLTAGE FOR THE APPLIANCES.

NOTIFICATION APPLIANCE CIRCUIT POWER REQUIREMENTS – 2ND FLOOR

DESCRIPTION	CURRENT PER APPLIANCE	# OF APPLIANCES CIRCUIT AV1	CIRCUIT AV2	CIRCUIT AV3
WHEELOCK HORN/STROBE 15 cd	0.066	6	7	2
WHEELOCK HORN/STROBE 30 cd	0.101	0	1	3
WHEELOCK HORN/STROBE 75 cd	0.177	1	1	2
WHEELOCK HORN/STROBE 110 cd	0.232	0	0	6
WHEELOCK STROBE 15 cd	0.060	2	0	4
TOTAL CIRCUIT CURRENT		0.674	0.763	0.730

NOTES:

THE FOLLOWING NOTIFICATION APPLIANCES AND THEIR POWER DEMANDS WERE USED IN THE DESIGN:

1. WHEELOCK INC. HS4-24MCW; 15CD WALL MOUNTED HORN/STROBE; 0.066 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP
2. WHEELOCK INC. SERIES HS4-24MCW; 30CD WALL MOUNTED HORN/STROBE; 0.101 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP
3. WHEELOCK INC. SERIES HS4-24MCW; 75CD WALL MOUNTED HORN/STROBE; 0.177 AMP MAX UL POWER REMAND; RATED 16 TO 33 AMP
4. WHEELOCK INC. SERIES HS4-24MCW; 110CD WALL MOUNTED HORN/STROBE; 0.232 AMP MAX UL POWER REMAND; RATED 16 TO 33 AMP
5. WHEELOCK INC. SERIES HS4-24MCW; 15CD WALL MOUNTED STROBE; 0.060 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP

VOLTAGE DROP CALCULATIONS

{(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT POWER LOAD
D = CONDUCTOR ONE WAY DISTANCE
21.6 = CONSTANT
CM = CROSS SECTION AREA OF WIRE (4110 FOR AWG#14)

NAC A1R
{0.674 AMP) (600 FT) (21.64)}/4110 VOLTAGE DROP: 2.129 VOLTS AVAILABLE VOLTAGE: 21.871 VOLTS

NAC A1S
{0.745 AMP) (600 FT) (21.64)}/4110 VOLTAGE DROP: 2.334 VOLTS AVAILABLE VOLTAGE: 21.662 VOLTS

NAC A1B
{0.730 AMP) (600 FT) (21.64)}/4110 VOLTAGE DROP: 2.312 VOLTS AVAILABLE VOLTAGE: 21.688 VOLTS

THE CIRCUIT'S AVAILABLE VOLTAGE IS ABOVE THE MINIMUM LISTED VOLTAGE FOR THE APPLIANCES.

OBSOLETE. REFER TO VOLTAGE DROP CALCULATIONS SHOWN ON SIEMENS DRAWING FA-03.

NOTIFICATION APPLIANCE CIRCUIT POWER REQUIREMENTS – 2ND FLOOR FROM SIEMENS DRAWING FA-03

CIRCUIT	DISTANCE FT	ORIGINAL CURRENT (AMP)	ORIGINAL VOLTAGE DROP (VOLTS)	ORIGINAL AVAILABLE VOLTAGE (VOLTS)	NEW CURRENT (AMP)	NEW VOLTAGE DROP (VOLTS)	NEW AVAILABLE VOLTAGE (VOLTS)
AV1	600	0.744	2.441	21.559	0.874	2.765	21.235
AV2	600	0.737	2.324	21.676	0.862	2.723	21.277
AV3	600	0.676	2.133	21.868	0.728	2.304	21.696

NOTES:

THE FOLLOWING SIEMENS HORNS AND ASSOCIATED LOADS WERE USED FOR THESE CALCULATIONS. OTHER HORNS MAY BE USED PROVIDED THEIR CURRENT DRAW DOES NOT EXCEED THOSE SHOWN FOR THESE CALCULATIONS.

1. SIEMENS SERIES AVL WALL MOUNTED HORN; 0.025 AMP MAX UL POWER DEMAND (MIDDLES SETTING FOR 84 DBA); RATED 16 TO 33 AMP

THE CIRCUIT'S AVAILABLE VOLTAGE IS ABOVE THE MINIMUM LISTED VOLTAGE FOR THE APPLIANCES.

NOTIFICATION APPLIANCE CIRCUIT POWER REQUIREMENTS – 3RD FLOOR

DESCRIPTION	CURRENT PER APPLIANCE	# OF APPLIANCES CIRCUIT A1F	CIRCUIT A2F	CIRCUIT A3F
WHEELOCK HORN/STROBE 15 cd	0.066	4	3	0
WHEELOCK HORN/STROBE 30 cd	0.101	2	0	2
WHEELOCK HORN/STROBE 75 cd	0.177	1	0	0
WHEELOCK HORN/STROBE 110 cd	0.232	0	2	2
WHEELOCK STROBE 15 cd	0.060	2	0	1
TOTAL CIRCUIT CURRENT		0.662	0.662	0.726

NOTES:

THE FOLLOWING NOTIFICATION APPLIANCES AND THEIR POWER DEMANDS WERE USED IN THE DESIGN:

1. WHEELOCK INC. HS4-24MCW; 15CD WALL MOUNTED HORN/STROBE; 0.066 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP
2. WHEELOCK INC. SERIES HS4-24MCW; 30CD WALL MOUNTED HORN/STROBE; 0.101 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP
3. WHEELOCK INC. SERIES HS4-24MCW; 75CD WALL MOUNTED HORN/STROBE; 0.177 AMP MAX UL POWER REMAND; RATED 16 TO 33 AMP
4. WHEELOCK INC. SERIES HS4-24MCW; 110CD WALL MOUNTED HORN/STROBE; 0.232 AMP MAX UL POWER REMAND; RATED 16 TO 33 AMP
5. WHEELOCK INC. SERIES HS4-24MCW; 15CD WALL MOUNTED STROBE; 0.060 AMP MAX UL POWER DEMAND; RATED 16 TO 33 AMP

VOLTAGE DROP CALCULATIONS

{(I) (D) (21.6)}/CM
WHERE: I = CIRCUIT POWER LOAD
D = CONDUCTOR ONE WAY DISTANCE
21.6 = CONSTANT
CM = CROSS-SECTION AREA OF WIRE (4110 FOR AWG#14)

NAC A1F
{0.662 AMP) (700 FT) (21.64)}/4110 VOLTAGE DROP: 2.440 VOLTS AVAILABLE VOLTAGE: 21.560 VOLTS

NAC A2F
{0.662 AMP) (700 FT) (21.64)}/4110 VOLTAGE DROP: 2.440 VOLTS AVAILABLE VOLTAGE: 21.560 VOLTS

NAC A3F
{0.726 AMP) (700 FT) (21.64)}/4110 VOLTAGE DROP: 2.676 VOLTS AVAILABLE VOLTAGE: 21.324 VOLTS

THE CIRCUIT'S AVAILABLE VOLTAGE IS ABOVE THE MINIMUM LISTED VOLTAGE FOR THE APPLIANCES.

OBSOLETE. REFER TO VOLTAGE DROP CALCULATIONS SHOWN ON SIEMENS DRAWING FA-03.

NOTIFICATION APPLIANCE CIRCUIT POWER REQUIREMENTS – 2ND FLOOR FROM SIEMENS DRAWING FA-03

CIRCUIT	DISTANCE FT	ORIGINAL CURRENT (AMP)	ORIGINAL VOLTAGE DROP (VOLTS)	ORIGINAL AVAILABLE VOLTAGE (VOLTS)	NEW CURRENT (AMP)	NEW VOLTAGE DROP (VOLTS)	NEW AVAILABLE VOLTAGE (VOLTS)
AV8	700	0.802	3.134	20.866	0.952	3.509	20.491
AV9	700	0.822	3.024	20.976	0.947	3.490	20.510

NOTES:

THE FOLLOWING SIEMENS HORNS AND ASSOCIATED LOADS WERE USED FOR THESE CALCULATIONS. OTHER HORNS MAY BE USED PROVIDED THEIR CURRENT DRAW DOES NOT EXCEED THOSE SHOWN FOR THESE CALCULATIONS.

1. SIEMENS SERIES AVL WALL MOUNTED HORN; 0.025 AMP MAX UL POWER DEMAND (MIDDLES SETTING FOR 84 DBA); RATED 16 TO 33 AMP

THE CIRCUIT'S AVAILABLE VOLTAGE IS ABOVE THE MINIMUM LISTED VOLTAGE FOR THE APPLIANCES.

FIRE ALARM SYSTEM FUNCTION CHART

SPECIAL NOTE:

REFER TO SHEET FA-2.1 FOR FUNCTIONS ASSOCIATED WITH THE ICS NODE ON THE 1ST FLOOR.

SYSTEM EVENT / RESPONSE	ANNUNCIATE EVENT AT FACU	FIRE SIGNAL TO LBNL RECEIVER	TROUBLE SIGNAL TO LBNL	SUPERVISORY SIGNAL TO LBNL	OPERATE NOTIFICATION APPLIANCES	RECALL ELEVATOR PRIMARY FLOOR	RECALL ELEVATOR SECONDARY FLOOR	OPERATE ELEVATOR POWER SHUNT	CLOSE ELEVATOR SMOKE GUARD	SHUT DOWN HVAC FAN UNIT	CLOSE/ROLL DOWN DOOR	CLOSE FIRE/SMOKE DAMPER
FIRE CALL BOX	●	●			●							
SMOKE DETECTOR	●	●			●							
FIRE SPRINKLER WATERFLOW SWITCH	●	●			●							
ELEVATOR LOBBY DETECTOR 1ST FLOOR	●	●			●		●					
LOBBY DETECTOR REMAINING FLOORS	●	●			●	●			●			
ELEVATOR MACHINE RM SMOKE	●	●			●	●						
ELEVATOR MACHINE RM WATERFLOW	●	●			●			●				
ELEVATOR MACHINE RM HEAT DETECTOR	●	●			●			●				
HVAC DUCT SMOKE DETECTOR	●	●			●					●		
FSD DUCT SMOKE DETECTOR	●	●			●							●
DETECTOR AT ALS OPENING/DOOR	●	●			●						●	
VALVE POSITION SUPERVISORY SWITCH	●			●								
AC POWER FAILURE	●		●									
SYSTEM FAULT	●		●									

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

ASBUILT
A
05/20/2013

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)	REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
	A	DSV	LDD	MCD	05-13	ASBUILT

BLDG-15 FIRE ALARM
FUNCTION CHARTS, VOLTAGE DROP.
BATTERY & POWER CALCULATIONS

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWN BY DSV	DATE 05/20/2013	
CHECKED BY LDD	05/20/2013	
APPROVED BY MCD	05/20/2013	
SCALE NONE		
DRAWING NO. 4B15E058A	SHEET 02	
PROJECT NO. FN1438	2 OF 9	