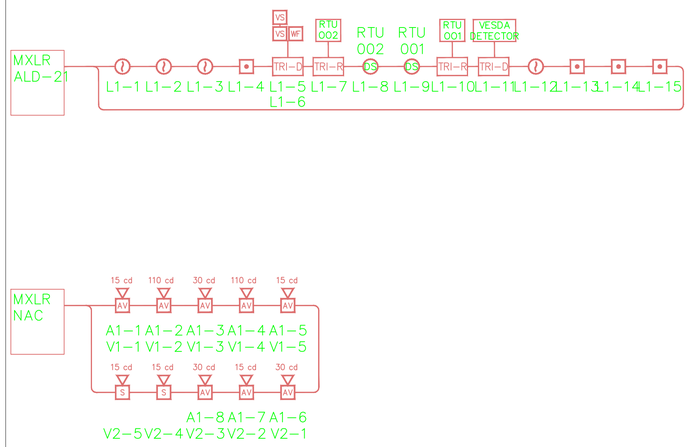

3 RISER DIAGRAMS
N.T.S.

FACU POWER SUPPLY & BATTERY
FAP-001-86 (MXLR) - 6 AMP

SUPERVISORY CURRENT					
DESCRIPTION	QUANTITY	MODULE CURRENT	EOL CURRENT	DEVICE CURRENT	TOTAL ROW CURRENT
PSR-1 REMOTE CONTROL PANEL	1	0.070	NA	NA	0.070
ALD-21 ANALOG LOOP DRIVER	1	0.105	NA	NA	0.105
ALD LOOP	1	NA	NA	0.066	0.066
CSM-4 CONTROLLABLE SIGNAL MODULE	2	0.100	NA	NA	0.020
NOTIFICATION APPLIANCE CIRCUITS	3	NA	0.012	NA	0.036
NET-7 NETWORK CARD	1	0.030	NA	NA	0.030
TOTAL SUPERVISORY CURRENT					0.327

ALARM CURRENT	
MXLR OCCUPANT NOTIFICATION APPLIANCE CIRCUITS	TOTAL CIRCUIT CURRENT LOAD
CIRCUIT A1	0.696 AMP
CIRCUIT V1	0.652 AMP
CIRCUIT V2	0.364 AMP
TOTAL ALARM CURRENT	1.712 AMP

SUMMARY

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

MINIMUM BATTERY CAPACITY = {0.327 X 24 HR} + {1.712 X 0.083 HR} X 1.25

MINIMUM BATTERY CAPACITY = {7.848 AHR + 0.143 AHR} X 1.25 = 9.99 AHR

NOTIFICATION APPLIANCE CIRCUIT POWER REQUIREMENTS

	NUMBER OF APPLIANCES			
DESCRIPTION	CURRENT PER APPLIANCE	CIRCUIT A1	CIRCUIT V1	CIRCUIT V2
WHEELOCK RSS STROBE 15 cd	0.060	0	0	2
WHEELOCK RSS STROBE 30 cd	0.092	0	0	0
WHEELOCK RSS STROBE 75 cd	0.165	0	0	0
WHEELOCK RSS STROBE 110 cd	0.220	0	0	0
WHEELOCK HS HORN/STROBE 15 cd (STROBE ONLY)	0.060	0	2	1
WHEELOCK HS HORN/STROBE 30 cd (STROBE ONLY)	0.092	0	1	2
WHEELOCK HS HORN/STROBE 75 cd (STROBE ONLY)	0.165	0	0	0
WHEELOCK HS HORN/STROBE 110 cd (STROBE ONLY)	0.220	0	2	0
WHEELOCK HS HORN/STROBE 110 cd (HORN ONLY)	0.087	8	0	0
TOTAL CIRCUIT CURRENT		0.696	0.652	0.364

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 A1
{(0.696 AMP) (200 FT) (21.64)}/4110 VOLTS — VOLTAGE DROP: 0.733

NAC V1
{(0.652 AMP) (200 FT) (21.64)}/4110 VOLTS — VOLTAGE DROP: 0.687

NAC V2
{(0.364 AMP) (200 FT) (21.64)}/4110 VOLTS — VOLTAGE DROP: 0.383

ALL CIRCUITS' AVAILABLE VOLTAGES ARE ABOVE THE MINIMUM LISTED VOLTAGE FOR THE APPLIANCES.

FIRE ALARM SYSTEM FUNCTION CHART:

SYSTEM EVENT \ RESPONSE	ANNUNCIATE EVENT AT FACU	FIRE SIGNAL TO LBNL RECEIVER	TROUBLE SIGNAL TO LBNL	SUPERVISORY SIGNAL TO LBNL	OPERATE NOTIFICATION APPLIANCES	SHUTDOWN "BUBBLE" SUPPLY AIR	SHUT DOWN HVAC FAN UNIT
FIRE CALL BOX	●	●			●		
SMOKE DETECTOR	●	●			●		
FIRE SPRINKLER WATER FLOW SWITCH	●	●			●		
ROOM HSSD DETECTION (LEVELS 1& 2)	●			●			
ROOM HSSD DETECTION (LEVEL 3)	●	●			●		
"BUBBLE" HSSD DETECTION (LEVELS 1 & 2)	●			●			
"BUBBLE" HSSD DETECTION (LEVEL 3)	●	●			●		
HVAC DUCT SMOKE DETECTOR	●	●			●		●
VALVE POSITION SUPERVISORY SWITCH	●			●			
AC POWER FAILURE	●		●				
SYSTEM FAULT	●		●				

LEGEND

- L1-01 — SMOKE DETECTOR, ADDRESS AS NOTED
- L1-02 — DUCT SMOKE DETECTOR, ADDRESS AS NOTED
- L1-03 — FIRE CALL BOX, ADDRESS AS NOTED
- FACU — FIRE ALARM SYSTEM CONTROL UNIT (MXL)
- V-01 15 cd — STROBE, NUMBER & MINIMUM CANDELA RATING
- A-01 110 cd — HORN/STROBE, NUMBER AND MINIMUM CANDELA
- L1-05 — SPRINKLER VALVE SUPERVISORY SWITCH, ADDRESS AS NOTED
- L1-06 — SPRINKLER WATERFLOW SWITCH, ADDRESS AS NOTED
- TRI — INTELLIGENT INTERFACE MODULE
- HSSD — HIGH SENSITIVITY SMOKE DETECTOR (HSSD)
- HSSD SAMPLE PIPING AND SAMPLE ORIFICE
- EOL — END-OF-LINE DEVICE
- JUNCTION BOX
- FIRE ALARM CONDUIT (3/4-INCH)
- FIRE ALARM CIRCUIT IDENTIFICATION
  - L1 - 1 PAIR; SLC/ALD LOOP (L1)
  - A1 - 1 PAIR #14; AUDIBLE CIRCUIT
  - V1/V2 - 1 PAIR #14; VISUAL CIRCUIT
  - (TYPICAL UND)- TYPICAL UNLESS NOTED

LOOP 1 - ENTIRE BUILDING

ADDRESS	SMOKE DETECTOR WITH STANDARD BOSE	SMOKE DETECTOR	TRI-R	TRI-D VESDA	TRI-D WATERFLOW SWITCH	TRI-D VALVE SUPERVISION	MANUAL FIRE CALL BOX	COMMENTS
L1-01	●							
L1-02	●							
L1-03	●							
L1-04							●	
L1-05					●			
L1-06						●		
L1-07			●					RTU 002
L1-08		●						RTU 002
L1-09		●						RTU 001
L1-10			●					RTU 001
L1-11				●				VESDA
L1-12	●							COMMUNICATION
L1-13							●	
L1-14							●	
L1-15							●	
L1-16								
L1-17								
L1-18								
L1-19								
L1-20								
L1-21								
L1-22								
L1-23								
L1-24								
L1-25								
L1-26								
L1-27								
L1-28								
L1-29								
L1-30								
TOTAL	4	2	2	1	1	1	4	

NOTE: EACH ALD-21 HAS A 60 ADDRESS CAPACITY.

AS BUILT
—
07/19/2013

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
_	DSV	LDD	MCD	7-19-13	AS BUILT FROM A/E RECORD DWG

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)
ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)

BLDG 86 FIRE ALARM
RISER DIAGRAM, FUNCTION CHART
CALCULATION & LEGEND

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWN BY DSV	DATE 07/19/2013	
CHECKED BY LDD	07/23/2013	
APPROVED BY MCD	07/23/2013	
SCALE AS NOTED		
DRAWING NO. 4B86E025_	SHEET 1	
PROJECT NO. FM5500	1 OF 4	