PROJECT DESCRIPTION

THE EXISTING LAWRENCE BERKELEY NATIONAL LABORATORY (LBNL) FIRE ALARM RECEIVING SYSTEM CONSISTS OF A PYROTRONICS MULTI–ALARM VI SYSTEM INSTALLED IN 1981. THE EXISTING SYSTEM FUNCTIONS AS A PROPRIETARY RECEIVING SYSTEM BY MONITORING CONTACTS ON LOCAL CONTROL UNITS THROUGH MUX–203 AND MUX–316 TRANSMITTERS VIA TWO HARD–WIRED LOOPS ROUTED THROUGHOUT THE FACILITY USING A COMBINATION OF HUB AND SPOKE ARRANGEMENTS. ALARMS ARE RECEIVED AT THE MULTI–ALARM VI FOR EACH SET OF CONTACTS (OR ZONE) IN EACH LOCAL FIRE ALARM CONTROL PANEL (FAP) RESULTING FROM THE HARD–WIRED CONNECTIONS TO THE TRANSMITTERS.

THIS PROJECT PROVIDES THE PHASE I DESIGN FOR THE MULTI–PHASED FIRE ALARM REPLACEMENT PROJECT. THIS PROJECT WILL INCLUDE A NEW/REPLACEMENT FIRE ALARM RECEIVER (A SIEMENS CERBERUS MXL CONTROL UNIT) INSTALLED IN BUILDING 48 (LBNL'S FIRE STATION); NEW CONVENTIONAL LOCAL FAP'S (SIEMENS CERBERUS SYSTEM 3 FAP'S) FOR BUILDINGS WHICH CURRENTLY DO NOT HAVE A LOCAL FAP AND TO REPLACE EXISTING SYSTEM 3 FAP'S USING CP–30 TECHNOLOGY; AND MODIFICATIONS TO EXISTING SYSTEM 3 FAP'S USING CP–35 TECHNOLOGY TO ENABLE THEIR SIGNALS TO BE TRANSMITTED TO THE NEW RECEIVER. THE NEW MXL CONTROL UNIT INSTALLED IN BUILDING 48 WILL ALSO SERVE AS A LOCAL FAP FOR BUILDINGS 48, 43 AND 45.

EACH LOCAL FAP WILL UTILIZE MID–16 MODULES TO TRANSMIT LOCAL ALARM, SUPERVISORY, AND TROUBLE SIGNALS TO A MOI–7 MODULE. THE INSTALLATION OF EACH MOI–7 MODULE ALSO REQUIRES THE INSTALLATION OF A NEW 5 VDC POWER SUPPLY IN EACH LOCAL FAP. EACH MOI–7 MODULE WILL BE CONNECTED TO THE NEW RECEIVER VIA A PAIR OF WIRES (SIMILAR TO THE EXISTING COMMUNICATIONS LOOP), AND WILL BE RECEIVED AT THE NEW MXL CONTROL UNIT AT THE PSR–1, USING A NET–4 COMMUNICATIONS BOARD. THIS ARRANGEMENT CONSTITUTES A SIEMENS CERBERUS COMMUNICATIONS LOOP BETWEEN LOCAL FAP'S (USING MOI–7 MODULES) AND A MXL CONTROL UNIT. THE MXL CONTROL UNITS PROVIDED IN THE FUTURE PROJECT PHASES WILL COMMUNICATE WITH ONE ANOTHER AND THE ALARM RECEIVER USING OTHER ARRANGEMENTS, WHICH WILL BE DEVELOPED IN THE FUTURE PHASES.

THE NEW COMMUNICATIONS LOOP PROVIDED FOR PHASE I WILL CONSIST OF A PAIR OF CONDUCTORS (SIMILAR TO THE EXISTING COMMUNICATIONS LOOP). PHASE I OF THIS PROJECT INCLUDES THE FOLLOWING BUILDINGS:

BUILDING 2 (ALSO INCLUDES BUILDING 2A)
BUILDING 6
BUILDING 10
BUILDING 26
BUILDING 36
BUILDING 37 (ALSO INCLUDES BUILDINGS 34 AND 35)
BUILDING 46
BUILDING 47
BUILDING 48 (ALSO INCLUDES BUILDINGS 43 AND 45)
BUILDING 58 (ALSO INCLUDES BUILDING 58A)
BUILDING 80

THIS DESIGN ALSO PROVIDES FOR THE COMMUNICATIONS WITH A NEW FAP TO BE INSTALLED IN BUILDING 28 (TO BE CONSTRUCTED IN THE NEAR FUTURE).

FIRE ALARM CONTROL PANEL MODIFICATIONS/ADDITIONS

IN ADDITION TO WIRING MODIFICATIONS FOR THE NEW SIGNAL TRANSMISSION AND MODULE ADDITIONS, THE FOLLOWING BUILDING FIRE ALARM CONTROL PANEL MODIFICATIONS AND/OR ADDITIONS ARE PROVIDED FOR PHASE I.

BUILDING 2
- ONE NEW ZN–34U MODULE ADDED TO FAP–01A–002.
- FOUR NEW MID–16 MODULES ADDED TO FAP–01A–002.
- ONE NEW MOI–7 MODULE ADDED TO FAP–01B–002.
- ONE NEW PS–5A POWER SUPPLY ADDED TO FAP–01B–002.

BUILDING 6
- INSTALL NEW 24 MODULE PANEL EXTENSION.
- TWO NEW ZN–34U MODULES ADDED TO FAP–01–06.
- FOUR NEW MID–16 MODULES ADDED TO FAP–01A–06.
- ONE NEW MOI–7 MODULE ADDED TO FAP–01A–06.
- ONE NEW PS–5A POWER SUPPLY ADDED TO FAP–01B–06.

BUILDING 10

REPLACE EXISTING CP–30 SYSTEM 3 WITH CP–35 SYSTEM 3 CONTAINING:
- ONE SM–30 MODULE.
- ONE ZN–34U MODULE.
- THREE ZU–35 MODULES.
- ONE MID–16 MODULE.
- ONE MOI–7 MODULE.
- ONE PS–5A POWER SUPPLY.

BUILDING 26

INSTALL NEW CAN TO HOUSE:
- THREE NEW ZN–34U MODULES.
- ONE NEW MID–16 MODULE.
- ONE NEW MOI–7 MODULE.
- ONE NEW PS–5A POWER SUPPLY.

BUILDING 36

REPLACE EXISTING CP–30 SYSTEM 3 WITH CP–35 SYSTEM 3 CONTAINING:
- ONE SM–30 MODULE.
- ONE ZN–34U MODULE.
- THREE ZU–35 MODULES.
- ONE PM–31 MODULE.
- TWO AA–30U MODULES.
- ONE MID–16 MODULE.
- ONE MOI–7 MODULE.
- ONE PS–5A POWER SUPPLY.

BUILDING 37

INSTALL NEW CAN TO HOUSE:
- FOUR NEW ZN–34U MODULES.
- ONE NEW MID–16 MODULE.
- ONE NEW MOI–7 MODULE.
- ONE NEW PS–5A POWER SUPPLY.

BUILDING 46

REPLACE EXISTING CP–30 SYSTEM 3 WITH CP–35 SYSTEM 3 CONTAINING:
- ONE SM–30 MODULE.
- THREE ZN–34U MODULES.
- THREE ZU–35 MODULES.
- ONE SR–30 MODULE.
- ONE MID–16 MODULE.
- ONE MOI–7 MODULE.
- ONE PS–5A POWER SUPPLY.

BUILDING 47

INSTALL NEW CAN TO HOUSE:
- TWO NEW ZN–34U MODULES.
- ONE NEW ZU–35 MODULE.
- ONE NEW MID–16 MODULE.
- ONE NEW MOI–7 MODULE.
- ONE NEW PS–5A POWER SUPPLY.

BUILDING 48

REPLACE EXISTING SYSTEM 3 WITH A NEW MXL CONTROL UNIT CONTAINING:
- ONE MMB–2 MOTHERBOARD.
- ONE TSP–40 LOGGING PRINTER.
- THREE MOM–4 CARD CAGES.
- THREE CZM–4 CONVENTIONAL ZONE MODULES.
- ONE CRM–4 CONTROLLABLE RELAY MODULE.
- ONE NIM–1R NETWORK INTERFACE MODULE.
- ONE MPS–12 POWER SUPPLY.
- ONE PSR–1 REMOTE POWER SUPPLY.
- ONE NET–4 COMMUNICATION MODULE (IN PSR–1).
- ONE NCC–5041 NETWORK COMMAND CENTER.

BUILDING 58

REPLACE EXISTING HIGH VOLTAGE FIRE ALARM PANEL AND EXISTING CP–30 SYSTEM 3 WITH CP–35 SYSTEM 3 CONTAINING:
- TWO ZN–34U MODULES.
- FIVE ZU–35 MODULES.
- ONE MID–16 MODULE.
- ONE MOI–7 MODULE.
- ONE PS–5A POWER SUPPLY.
- REPLACE EXISTING SMOKE AND HEAT DETECTORS INSIDE THE BUILDING WITH DEVICES COMPATIBLE WITH THE NEW CP–35.
- REPLACE 110VAC BELLS WITH 24VDC BELLS.

BUILDING 80
- THREE NEW ZN–34U MODULES ADDED TO FAP–02–080.
- TWO NEW MID–16 MODULES ADDED TO FAP–02–080.
- ONE NEW MOI–7 MODULE ADDED TO FAP–02–080.
- ONE NEW PS–5A POWER SUPPLY ADDED TO FAP–02–080.

NOTES

1) THE PROJECT DRAWINGS ARE DIAGRAMMATIC IN THAT EXACT EQUIPMENT AND DEVICE CONDUCTOR ROUTING, CONDUCTOR SUPPORT AND CONSTRUCTION DETAILS ARE TO BE DEVELOPED BY THE CONTRACTOR BASED UPON FIELD INVESTIGATION AND CONDITIONS. THE PROJECT DRAWINGS WERE DEVELOPED USING THE BEST AVAILABLE DRAWINGS FROM LBNL AND LIMITED SITE INVESTIGATION TO THE EXTENT PRACTICAL AND NECESSARY FOR THE DESIGN. NOTE THAT NUMEROUS DISCREPANCIES APPEAR BETWEEN THE VARIOUS LBNL DRAWINGS SHOWING THE EXISTING FIRE ALARM SYSTEMS. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM ALL ALARM SIGNALING ARRANGEMENTS AND TO MAKE ANY AND ALL NECESSARY ADJUSTMENTS TO PROVIDE THE SIGNALING CAPABILITIES FOR THE NEW FIRE ALARM SYSTEM AT NO ADDITIONAL COST TO LBNL.

2) NEW/REPLACEMENT FIRE ALARM CONTROL PANELS (FAP) AND/OR THE INSTALLATION OF NEW CANS TO ACCOMMODATE ADDITIONAL MODULES TO THE EXISTING FAPS MAY REQUIRE THE RELOCATION OF EXISTING EQUIPMENT (E.G. THE RELOCATION OF THE BATTERY BOX FOR THE FAP FOR BUILDING 47, THE RELOCATION OF POWER EQUIPMENT ON THE NORTH WALL OF BUILDING 48 TO INSTALL THE NEW MXL CONTROL UNIT, ETC.). THE MX–203 AND MX–316 TRANSMITTERS SHALL BE REMOVED FROM EACH BUILDING AS THE NEW FAP IS INSTALLED, BROUGHT ON–LINE, AND SUCCESSFULLY TESTED.

3) THE SYSTEM INSTALLATION SHALL PROVIDE THE CAPABILITY TO TRANSMIT EACH OF THE SIGNALS TRANSMITTED FROM THE EXISTING FAP'S TO THE RECEIVER IN BUILDING 48. ADDITIONALLY, IN SOME INSTANCES, THE EXISTING SIGNALS HAVE BEEN SPLIT INTO TWO OR MORE SIGNALS TO PROVIDE A GREATER DEGREE OF ANNUNCIATION FOR ALARM EVENTS.

4) THE NETWORK SHOWN FOR MXL 1–48 (DRAWING 4B48E018) IS CONCEPTUAL. THE CONTRACTOR MAY CONNECT THE MOI–7 MODULES FOR EACH CONTROL UNIT TO THE NETWORK IN A MANNER BEST FACILITATED BY THE EXISTING UNDERGROUND UTILITY SYSTEM. THE EXISTING FIRE ALARM TRANSMISSION CONDUCTORS/CABLES MAY BE USED FOR THE SIGNALING PATH BETWEEN THE NEW MXL CONTROL UNIT (MXL 1–48) AND THE MOI–7 MODULES ON THAT CONTROL UNIT'S NETWORK (AS SHOWN IN THE DRAWINGS). COMMUNICATIONS BETWEEN MXL CONTROL UNITS SHALL BE ACCOMPLISHED BY A NEW FIBER NETWORK.

5) THE DRAWINGS INDICATE A NEW MXL CONTROL UNIT FOR BUILDING 48 (TO BE CONSTRUCTED IN THE NEAR FUTURE). THE DESIGN FOR THE CONTROL UNIT FOR THIS FUTURE BUILDING IS NOT SHOWN AS PART OF THIS PROJECT. THE NEW MXL CONTROL UNIT PROVIDED FOR BUILDING 28 MAY ALSO BE USED IN FUTURE PROJECT PHASES TO ACCOMMODATE SIGNALS FROM OTHER BUILDINGS.

6) WITH MINOR EXCEPTIONS, THIS PROJECT DOES NOT PROVIDE NEW, AND/OR REPLACE EXISTING, FIRE ALARM DEVICES OR APPLIANCES WITHIN THE BUILDINGS. WITH MINOR EXCEPTIONS, THE EXISTING FIRE ALARM DEVICES AND APPLIANCES WITHIN EACH BUILDING SHALL REMAIN, BUT BE CONNECTED TO THE NEW EQUIPMENT PROVIDED BY THIS PROJECT.

7) ALL NEW WIRING INSTALLATION METHODS, WIRE SIZES, AND WIRE IDENTIFICATION SHALL BE IN ACCORDANCE WITH LBNL'S STANDARDS.

8) ALL CONDUCTORS SHALL BE IDENTIFIED USING PLASTIC OR METAL LABELS, FACTORY COLORED WIRES OR BY USING COLOR BANDS OR TAPE INTENDED FOR THE PURPOSE AND APPROVED FOR WET, OUTDOOR APPLICATIONS AT ALL TERMINATIONS, JUNCTIONS, AND WHEREVER THE CONDUCTORS ARE ACCESSIBLE IN PULL BOXES. IDENTIFY CONDUCTORS IN OUTLETS, PULL BOXES, PANELBOARDS, AND SIMILAR LOCATIONS WHERE CONDUCTORS ARE ACCESSIBLE WITH THOMAS AND BETTS, BRADY, OR EQUAL, PRINTED PLASTIC ADHESIVE TAPES TO SHOW CIRCUIT NUMBER. WRAP TAPES AT LEAST TWO TURNS AROUND CONDUCTOR.

9) WIRING SHALL BE PROTECTED IN ACCORDANCE WITH THE ELECTRICAL CODE (SPECIFICALLY ARTICLE 760). ALL WIRING SHALL BE IN CONDUIT.

10) WIREZE, MINERALLAC NO. 100, OR EQUAL, MAY BE USED FOR INSTALLATION OF CONDUCTORS IN CONDUITS, EXCEPT THAT NO LUBRICANT WILL BE PERMITTED ON CONDUCTORS OF GROUND ISOLATED CIRCUITS.

11) PROVIDE NEAT AND WORKMANLIKE INSTALLATION WITH CONDUCTORS TRAINED AND SERVED WITH T&B TY–RAP, VIRGINIA PLASTICS, OR EQUAL, NYLON WIRE TIES IN PANELBOARDS, TERMINAL CABINETS, SWITCHBOARDS, GUTTERS, EQUIPMENT ENCLOSURES AND SIMILAR LOCATIONS.

12) ALL WIRING SHALL BE INSTALLED IN COMPLIANCE WITH THE CALIFORNIA ELECTRICAL CODE (SPECIFICALLY ARTICLE 760) AND NFPA 72, NATIONAL FIRE ALARM CODE.

13) WIRING WITHIN ENCLOSURES SHALL BE NEATLY BUNDLED AND STRAPPED OR FASTENED TO SUB–PANELS OR ENCLOSURE SURFACES. WIRING CONNECTED TO HINGED DOORS SHALL BE BUNDLED AND SLEEVED IN A FLEXIBLE PLASTIC TUBING TO PERMIT OPENING AND CLOSING OF THE DOOR WITHOUT STRAINING WIRING AND WITHOUT ABRASION.

14) KEEP CONDUIT CLOSED AND MOISTURE–TIGHT DURING CONSTRUCTION. PERMANENTLY AND EFFECTIVELY GROUND ALL CONDUIT SYSTEMS.

15) NO CABLE SHALL BE INSTALLED IN VENTILATION DUCTS OR PLENUMS WITHOUT SPECIFIC PRIOR WRITTEN APPROVAL OF LBNL.

16) NO CLASS 2 OR 3 SIGNAL WIRING SHALL BE INSTALLED IN CONDUIT WITH LIGHT, POWER, OR CLASS 1 SIGNAL WIRING.

17) ALL WIRING, EXCEPT WIRING INSIDE ENCLOSURES, SHALL BE CABLED WITH A THERMOPLASTIC INSULATION JACKET, WITH A VOLTAGE RATING EXCEEDING THE VOLTAGE OF ANY POWER IN PROXIMITY TO THE WIRING.

18) ALL SIGNAL WIRING SHALL BE OPERATED AT NOT MORE THAN 30 VOLTS, AC OR DC.

19) MAINTAIN WATERPROOF INTEGRITY OF PENETRATIONS OF MATERIALS INTENDED TO BE WATERPROOF. PROVIDE WATERPROOF NEMA 3R ENCLOSURES FOR ALL EQUIPMENT OR DEVICES MOUNTED OUTSIDE OR OTHERWISE EXPOSED TO THE WEATHER.

20) CONDUIT SIZE SHALL BE MINIMUM 3/4 INCH. CONDUIT SYSTEMS SHALL BE WORKED INTO COMPLETE INTEGRATED ARRANGEMENTS, WITH LIKE ELEMENTS TO PRESENT AN ORDERLY, NEAT, AND WORKMANLIKE APPEARANCE.

21) INSTALL CONDUIT AS HIGH AS PRACTICABLE TO MAINTAIN ADEQUATE HEADROOM. NOTIFY LBNL BEFORE INSTALLATION WHENEVER HEADROOM OF LESS THAN SIX FEET – EIGHT INCHES WILL RESULT.

22) ALL NEW CONDUIT SHALL BE SECURELY FASTENED IN PLACE AT INTERVALS OF NOT MORE THAN SEVEN FEET, WITH SUITABLE CLAMPS OR FASTENERS OF APPROVED TYPE, AND ALL VERTICAL CONDUITS SHALL BE PROPERLY SUPPORTED TO PRESENT A MECHANICALLY RIGID AND SECURE INSTALLATION.

23) MAINTAIN AT LEAST 6–INCH CLEARANCE BETWEEN NEW CONDUIT AND PIPING. MAINTAIN 12–INCH CLEARANCE BETWEEN NEW CONDUIT AND HEAT SOURCES

24) NO NEW CONDUIT SHALL BE FASTENED TO OTHER CONDUIT OR PIPES OR INSTALLED SO AS TO PREVENT THE READY REMOVAL OF OTHER PIPES FOR REPAIRS.

25) THE INTERIOR OF ALL NEW RACEWAYS SHALL BE THOROUGHLY CLEAN AND FREE FROM CEMENT, PAINT, GREASE, PLASTER, AND DIRT.

26) CONDUIT SHALL BE CONTINUOUS FROM PANELS TO BOXES. PULL BOXES AND SPLICE BOXES SHALL BE INSTALLED WHERE REQUIRED TO FACILITATE INSTALLATION OF CONDUCTORS AND TO COMPLY WITH CODE REQUIREMENTS. DIFFERENT TYPES OF NEW CONDUITS SHALL NOT BE INTERMIXED IN ANY RUN.

27) WHEREVER POSSIBLE, NEW CONDUIT SHALL BE INSTALLED TO BE FREE OF TRAPS WHERE CONDENSATION WATER COULD ACCUMULATE.

28) ALL NEW FIRE ALARM EQUIPMENT, MODULES, DEVICES, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND REQUIREMENTS.

CONSULTING FIRM

CONSULTING FIRM

HYT Corporation
FIRE PROTECTION ENGINEERS – CONSULTANTS
3408 CLAYTON ROAD – SUITE 101, CONCORD, CALIFORNIA 94519
PHONE: (925) 681–2731 * FAX: (925) 681–2733
CONSULTING A/E FIRM (PRIME)

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

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, AS–BUILT)

RECORD DWG
12/7/01

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
—	—	—	—	—	—

REPLACEMENT FIRE ALARM SYSTEM
PROJECT DESCRIPTION & NOTES

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DEPARTMENT

DRAWN BY	HYT
DATE	06/18/01
CHECKED BY	HYT
DATE	06/18/01
APPROVED BY	—
CAD FILE PATH	I:\DWGFILES\ELEC\48\FA8040\00012341
SCALE	AS NOTED
DRAWING NO.	4B48E020
SHEET	FA–2
PROJECT NO.	FA8040
	1 OF 2