

Date (mm dd yyyy)	Issued For	Rev.
12-07-2007	TITLE II DESIGN 30% REVIEW SUBMITTAL	C
03-28-2008	TITLE II DESIGN 60% REVIEW SUBMITTAL	D
07-31-2008	TITLE II DESIGN 90% REVIEW SUBMITTAL	E
08-25-2008	TITLE II DESIGN 100% OWNER REVIEW	F
02-19-2009	TITLE II CONSTRUCTION BID ISSUE	0

GENERAL NOTES

- NOT EVERY SYMBOL SHOWN ON SHEET E-002 MAY BE USED ON THIS PROJECT. ONLY THOSE SYMBOLS SHOWN ON PLANS AND DIAGRAMS APPLY.
- ALL CONDUIT SHALL BE 3/4" MINIMUM GALVANIZED RIGID STEEL UNLESS OTHERWISE NOTED. EMT MAY BE USED IN WALLS AND ABOVE THE CEILING IN FINISHED AREAS.
- UNLESS OTHERWISE INDICATED ON THE DRAWING, THE NORTH AND EAST SIDE OF ALL COLUMNS SHALL BE RESERVED FOR MOUNTING OF ELECTRICAL ITEMS ONLY; e.g. SWITCHES, STARTERS, ALARMS, CONDUIT, ETC. THE SOUTH AND WEST SIDE OF ALL COLUMNS SHALL BE RESERVED FOR MOUNTING OF MECHANICAL ITEMS ONLY; e.g. PIPING, THERMOSTATS, WATER COOLERS, FIRE HOSES, ETC. RECEPTACLES AND POWER OUTLETS SHALL BE INSTALLED WITHIN THE WEB OF THE COLUMN. (SURFACE MOUNTING OF THESE DEVICES ON THE FACE OF THE COLUMN IS UNACCEPTABLE.) IT MAY BE NOTED THAT FOR CLARIFICATION OF INFORMATION, ELECTRICAL ITEMS MIGHT HAVE BEEN INDICATED ON ANY SIDE OF COLUMNS OR EVEN AWAY FROM THE COLUMNS.
- ALL CONDUIT PENETRATIONS THROUGH WALLS, FLOORS AND ROOFS SHALL BE SEALED WATERPROOF AND FIRE PROOFED UNLESS OTHERWISE NOTED. SEAL FIRE PROOF TO MAINTAIN RATING OF WALL, FLOOR OR ROOF.
- CONTRACTOR SHALL COORDINATE INSTALLATION WITH ALL OTHER TRADES.
- CONDUIT DROPS ALONG COLUMN OR WALL SHALL BE PAINTED TO MATCH THE COLUMN OR WALL. COLOR BY ARCHITECTURAL TRADE.
- CONDUIT AND WIRE SIZE FOR LIGHTING SHALL BE 3/4", #10 AND 1#10(G) MINIMUM, UNLESS OTHERWISE NOTED. WIRE SIZE SHALL BE INCREASED AS REQUIRED IF VOLTAGE DROP EXCEEDS 3%. CONDUIT SIZE SHALL BE INCREASED AS REQUIRED TO CONFORM WITH NEC.
- CONDUIT AND WIRE SIZE FOR POWER WIRING SHALL BE 3/4", #12 AND 1#12(G) MINIMUM, UNLESS OTHERWISE NOTED. WIRE SIZE SHALL BE INCREASED AS REQUIRED IF VOLTAGE DROP EXCEEDS 3%. CONDUIT SIZE SHALL BE INCREASED AS REQUIRED TO CONFORM WITH NEC.
- DO NOT DRILL ANY HOLES THROUGH STEEL COLUMNS OR STEEL BEAMS.
- SEE MECHANICAL DRAWINGS FOR EXACT LOCATION OF MECHANICAL EQUIPMENT.
- FOR ELECTRICAL RATINGS OF EQUIPMENT PROVIDED BY MECHANICAL TRADES, SEE MECHANICAL EQUIPMENT SCHEDULES.
- WHEN REWORKING EXISTING LOADS AND CABLE IS NOT LONG ENOUGH, PROVIDE NEW CABLE SAME AS EXISTING. IF REQUIRED, RESIZE AS REQUIRED TO LIMIT VOLTAGE DROP TO 3%.
- ALL WORK SHOWN HEAVY LINE WEIGHT AND AS NOTED IS NEW.
- ALL NEW DEVICES (SWITCHES, RECEPTACLE, ETC.) AND FACE PLATES TO MATCH EXISTING IN COLOR AND TYPE.
- DIGITAL TIME SWITCH SHALL BE FOR 100 THRU 300 VOLT LIGHTING LOADS. SWITCH SHALL BE BLACK IN COLOR WITH TIME-OUT ADJUSTMENTS FROM 5 MINUTES TO 12 HOURS. LIGHTS TURNED OFF BEFORE TIME-OUT SETTING BY PRESSING ON/OFF BUTTON. TIME RESET TO ORIGINAL TIME-OUT SETTING BY HOLDING DOWN ON/OFF BUTTON FOR TWO SECONDS WHICH RESTARTS THE COUNT DOWN. VISUAL WARNING THAT FLASHES LIGHTS AT 5 MINUTES AND 1 MINUTE PRIOR TO TIME-OUT - WATT STOPPER TS-400-B OR APPROVED EQUAL. PROVIDE STAINLESS STEEL FACE PLATE FOR DIGITAL TIMER SWITCH.
- NO ALUMINUM WIRE CONDUCTORS SHALL BE USED FOR INSTALLATION OF BRANCH OR FEEDER CIRCUITS. USE COPPER WIRE CONDUCTORS.
- ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE/NFPA 70, NATIONAL ELECTRICAL SAFETY CODE AND OSHA REGULATIONS.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY AND CONSTRUCTION MEANS AND METHODS IN THE PERFORMANCE OF THE WORK. PROVIDE ALL MEASURES REQUIRED TO PROTECT THE STRUCTURE, WORKERS AND OTHER PERSONS DURING CONSTRUCTION OPERATIONS.
- RUN CONDUITS IN THE PUMP HOUSE AND BUILDING 600 PIPE TUNNEL UNDER THE FLOOR SLAB WHERE FEASIBLE.
- FIELD VERIFY EQUIPMENT ELECTRICAL REQUIREMENTS WITH APPROVED SHOP DRAWINGS AND REVISE FEEDERS ACCORDINGLY PER THE NEC.
- COORDINATE INSTALLATION OF CONDUIT WITH MECHANICAL SO NOT TO INTERFERE WITH MECHANICAL PIPING, DUCTS, ETC.
- THE CONTRACTOR SHALL FURNISH AS-BUILT INFORMATION REQUIRED BY THE OWNER'S ENGINEER TO PERFORM THE ARC FLASH STUDY. THE INFORMATION SHALL INCLUDE, BUT NOT LIMITED TO ALL OVERCURRENT PROTECTIVE DEVICES (TYPE, MANUFACTURER, MODEL, CHARACTERISTICS AND NAMEPLATE DATA) FEEDER INFORMATION (LENGTH AND TYPE OF CABLE AND RACEWAY) AND IDENTIFICATION AND NAMEPLATE DATA OF EQUIPMENT SERVED.

DEMOLITON NOTES

- DE-ENERGIZE THE EQUIPMENT IN CONSULTATION WITH THE OWNER PRIOR TO WORKING ON, DISCONNECTION AND REMOVAL OF EQUIPMENT AND CONDUIT/WIRING. LOCKOUT POWER SUPPLY WHERE APPLICABLE PER OWNER PROCEDURES. PROVIDE LOCK AND TAG.
- ALL USABLE REMOVED EQUIPMENT SHALL BE TURNED OVER TO THE OWNER UNDAMAGED. ALL REMOVED CONDUIT/WIRING SHALL BE REMOVED OFF SITE AND DISPOSED OF BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
- WHERE INDICATED TO REMOVE CONDUIT/WIRING, REMOVE BACK TO FIRST BOX OR TIE-IN POINT.
- CONTRACTOR MAY REUSE A PORTION OF EXISTING RACEWAY AND WIRING IF FEASIBLE.
- EQUIPMENT SHOWN CROSS HATCHED OR AS NOTED ON THE DRAWINGS IS TO BE REMOVED.
- PLUG ANY CONDUIT OPENINGS LEFT IN EQUIPMENT, RACEWAYS AND BOXES.

ELECTRICAL ABBREVIATIONS

A	AMPERE	M	METER
AC	ALTERNATING CURRENT	MA	MILLIAMPERE
ADD	ADDENDUM	MAX	MAXIMUM
AF	AMPERES, FRAME (BREAKER RATING)	MCC	MOTOR CONTROL CENTER
AFJ	ADJUSTABLE FREQUENCY CONTROLLER	MECH	MECHANICAL
AFB	ABOVE FINISHED FLOOR	MEZZ	MEZZANINE
AFG	ABOVE FINISHED GRADE	MFG	MANUFACTURING
AG	ABOVE GROUND	MFR	MANUFACTURER
AL	ALUMINUM	MH	MANHOLE, METAL HALIDE
AM	AMMETER	MHT	MOUNTING HEIGHT
APPROX	APPROXIMATE	MIC	MICROPHONE
ARCH	ARCHITECTURAL	MIN	MINIMUM
AS	AMMETER SWITCH	MISC	MISCELLANEOUS
ASR	AUTOMATIC SPRINKLER RISER	MLO	MAIN LUG ONLY
AT	AMPERE TRIP (BREAKER SETTING)	MO	MOTOR OPERATED
ATS	AUTOMATIC TRANSFER SWITCH	MTD	MOUNTED
AUX	AUXILIARY	MTG	MOUNTING
AWG	AMERICAN WIRE GAUGE	MTS	MANUAL TRANSFER SWITCH
BA	BARE	N	NEUTRAL, NORTH
BC	BOTTOM CHORD	NC	NORMALLY CLOSED
BD	BUS DUCT	NEC	NATIONAL ELECTRICAL CODE
BLOG	BUILDING	NF	NOT FUSED
BRK	BREAKER	NIC	NOT IN CONTRACT
		NL	NIGHT LIGHT
		NO	NORMALLY OPEN, NUMBER
		NTS	NOT TO SCALE
C	CONDUIT		
CAS	CONTROLLED ACCESS SYSTEM		
CB	CIRCUIT BREAKER		
CCTV	CLOSED CIRCUIT TELEVISION	OC	ON CENTER
CLF	CURRENT LIMITING FUSE	OFF	OFFICE
CLG	CEILING	OL	OVERLOAD
CKT	CIRCUIT	OPNG	OPENING
COAX	COAXIAL CABLE	PA	PUBLIC ADDRESS SYSTEM
COL	COLUMN	PB	PULLBOX
CONT	CONTINUATION (CONTINUOUS)	PBS	PUSH BUTTON STATION
CP	CONTROL PANEL	PDP	POWER DISTRIBUTION PANEL
CT	CURRENT TRANSFORMER	PF	POWER FACTOR
CTB	CURRENT TEST BLOCK	PH	PHASE
CU	COPPER	PIV	POST INDICATOR VALVE
		PL	PILOT LIGHT
DC	DIRECT CURRENT	PNL	PANEL
DEG	DEGREE	PP	POWER PANEL
DEPT	DEPARTMENT	PR	PAIR
DET	DETAIL	PR1	PRIMARY
DIA	DIAMETER	PS	PULL SWITCH
DISC	DISCONNECT	PT	POTENTIAL TRANSFORMER
DN	DOWN	PVC	POLYVINYL CHLORIDE
DP	DISTRIBUTION PANEL	PWR	POWER
DT	DOUBLE THROW		
DWG	DRAWING	RC	REMOTE CONTROL
		RCPT	RECEPTACLE
EA	EACH	RP	RECEPTACLE PANEL
EDP	EMERGENCY POWER DISTRIBUTION PANEL	RSC	RIGID STEEL CONDUIT
EF	EXHAUST FAN		
EL	ELEVATION	SD	SMOKE DETECTOR
ELEC	ELECTRIC (ELECTRICAL)	SEC	SECONDARY
ELP	EMERGENCY LIGHTING PANEL	SHLD	SHIELDED
ELR	END-OF-LINE RESISTOR	SHT	SHEET
EM	EMERGENCY	SIG	SIGNAL
EMCC	EMERGENCY MOTOR CONTROL CENTER	SP	SINGLE POLE
EMT	ELECTRIC METALLIC TUBING	EQ	ELECTRIC OPERATED
EO	ELECTRIC OPERATED	SPEC	SPECIFICATION
EPO	EMERGENCY POWER OFF	SPKR	SPEAKER
EQPT	EQUIPMENT	SS	SELECTION SWITCH
ERP	EMERGENCY RECEPTACLE PANEL	ST	SINGLE THROW
EUH	ELECTRIC UNIT HEATER	STP	SHIELDED TWISTED PAIR
EWC	ELECTRIC WATER COOLER	STP/OS	SHIELDED TWISTED PAIR W/ OVERALL SHIELD
EXST	EXISTING	STRUCT	STRUCTURAL
		SUBST	SUBSTATION
FA	FIRE ALARM	SW	SWITCH
FDR	FEEDER	SWBD	SWITCHBOARD
FIN	FINISH	SWGR	SWITCHGEAR
FIXT	FIXTURE	SYS	SYSTEM
FL	FLOOR		
FU	FUSE	T	THERMOSTAT
FUT	FUTURE	TB	TERMINAL BLOCK
		TEL	TELEPHONE
G	GROUND	TRP	POWER FACTOR TRANSDUCER
GEN	GENERATOR	TOJ	TOP OF STEEL
GFI	GROUND FAULT INTERRUPTER	TYP	TYPICAL
		UG	UNDERGROUND
HID	HIGH INTENSITY DISCHARGE	UH	UNIT HEATER
HGT	HEIGHT	UON	UNLESS OTHERWISE NOTED
HORIZ	HORIZONTAL	UTP	UNSHIELDED TWISTED PAIR
HP	HORSEPOWER	UTP/OS	UNSHIELDED TWISTED PAIR W/ OVERALL SHIELD
HPS	HIGH PRESSURE SODIUM		
HTR	HEATER	V	VOLT OR VOLTAGE
HV	HIGH VOLTAGE	VM	VOLTMETER
HVAC	HEATING VENTILATING AND AIR CONDITIONING	VP	VAPOR PROOF
		VS	VOLTMETER SWITCH
		VTR	VOLTAGE TRANSDUCER
IAC	INTERLOCKING ARMOR CABLE	W	WATT
IAC	INSTRUMENT AIR COMPRESSOR	WH	WATT-HOUR METER
IC	INTERCOM	WHD	WATT-HOUR DEMAND METER
IE	INVERT ELEVATION	WP	WEATHER PROOF
INC	INCANDESCENT, INCORPORATE	WR	WELDING RECEPTACLE
ISO	ISOLATED NEUTRAL	W/	WITH
		W/O	WITHOUT
kcMil	THOUSAND CIRCULAR MIL(S)		
KV	KILOVOLT	XMR	TRANSFORMER
KVA	KILOVOLT-AMPERES	XP	EXPLOSION PROOF
KVAR	KILOVOLT-AMPERES REACTIVE		
KW	KILOWATT		
KWH	KILOWATT-HOUR		
LA	LIGHTNING ARRESTOR		
LDP	LIGHTING DISTRIBUTION PANEL		
LP	LIGHTING PANEL		
LT	LIGHT		
LTG	LIGHTING		
LV	LOW VOLTAGE		

DRAWING No.	DRAWING TITLE
E-001	ELECTRICAL ABBR, NOTES & DWG LIST
E-002	ELECTRICAL SYMBOLS
E-003	POWER LOAD SUMMARY
E-100	GROUNDING PLAN
E-101	BUILDING 600A PUMP HOUSE PLANS
E-102	BUILDING 600A AUX. SYS PLANS
E-103	DEMO PLAN BUILDING 600
E-501	FIXTURE SCHEDULE AND DETAILS
E-502	MOTOR STARTER WIRING DETAILS
E-503	DETAILS
E-504	DETAILS
E-505	DETAILS
E-506	DETAILS
E-601	ONE LINE DIAGRAM
E-602	ONE LINE DIAGRAM
E-603	MCC-600A-2 ONE LINE DIAGRAM
E-604	MCC-600-3 ONE LINE DIAGRAM
E-605	MCC-600-4 ONE LINE DIAGRAM
E-606	BUSWAY ONE LINE DIAGRAMS
E-607	DP-2 & 3 RISERS & PNL SCHEDULES
E-608	FIRE ALARM SYSTEM RISER DIAGRAM
E-609	PAGING SYSTEM RISER DIAGRAM
E-610	SWGR & SUBSTATION FRONTAL DIAGRAMS
E-611	TELEPHONE SYSTEM RISER DIAGRAM
EL-100	LIGHTING PLAN PIPE TUNNEL
EL-101	LIGHTING PLAN OPERATING FLOOR
EL-102	LIGHTING PLAN ELECTRICAL MEZZ
EL-103	LIGHTING PLAN ROOF
EP-100	POWER PLAN PIPE TUNNEL
EP-101	POWER PLAN OPERATING FLOOR
EP-102	POWER PLAN ELECTRICAL MEZZ
EP-103	POWER PLAN ROOF
EP-301	ELECTRICAL SECTIONS
EP-302	ELECTRICAL SECTIONS
EP-400	ENLARGED PWR PLAN PIPE TUNNEL
EP-401	ENLARGED PWR PLAN OPERATING FLOOR
EP-402	ENLARGED PWR PLAN ELECTRICAL MEZZ
ES-101	ELECTRICAL SITE PLAN
ES-401	ENLARGED PLAN COOLING TOWER SITE
ES-402	ENLARGED PLAN SITE SUBSTATIONS
ES-403	ENLARGED PLAN SITE GROUNDING
EY-100	AUX SYS PLAN PIPE TUNNEL
EY-101	AUX SYS PLAN OPERATING FLOOR
EY-102	AUX SYS PLAN ELECTRICAL MEZZ
EY-103	AUX SYS PLAN ROOF

This drawing has been prepared solely for the use of Brookhaven National Laboratory and there are no representations of any kind made by Giffels, Partnership to any party with whom Giffels Partnership has not entered into a contract.

This drawing shall not be used for construction purposes until the seal and signature of the responsible registrant appears on the drawing and proper permit forms and related fees are transmitted by the Owner, Owner's Agent or Contractor to the Authority Having Jurisdiction.

Giffels, Partnership 25200 Telegraph Road, Suite 200 Southfield, Michigan 48033 USA Tel: 248-936-8000 Fax: 248-936-8111		Approved By E. BARTOY Project Manager G. KAPLAN Project Engineer/Architect J. BOSSORY Project No. SF070003	Approved By E. BARTOY Project Manager G. KAPLAN Project Engineer/Architect J. BOSSORY Project No. SF070003	JOB NO. SHEET NO. REVISION DATE DR. APPD. DA	DWG. TITLE ELECTRICAL ABBR, NOTES & DWG LIST	URS/OPPL/REV. NEW DATE ACCT. NO. SHEET OF	SCALE NONE EN. BY EA REVD BY RB JOB NO. 11705 DWG. NO. 600	SHEET NO. E-001
--	--	---	---	--	---	--	---	--------------------

