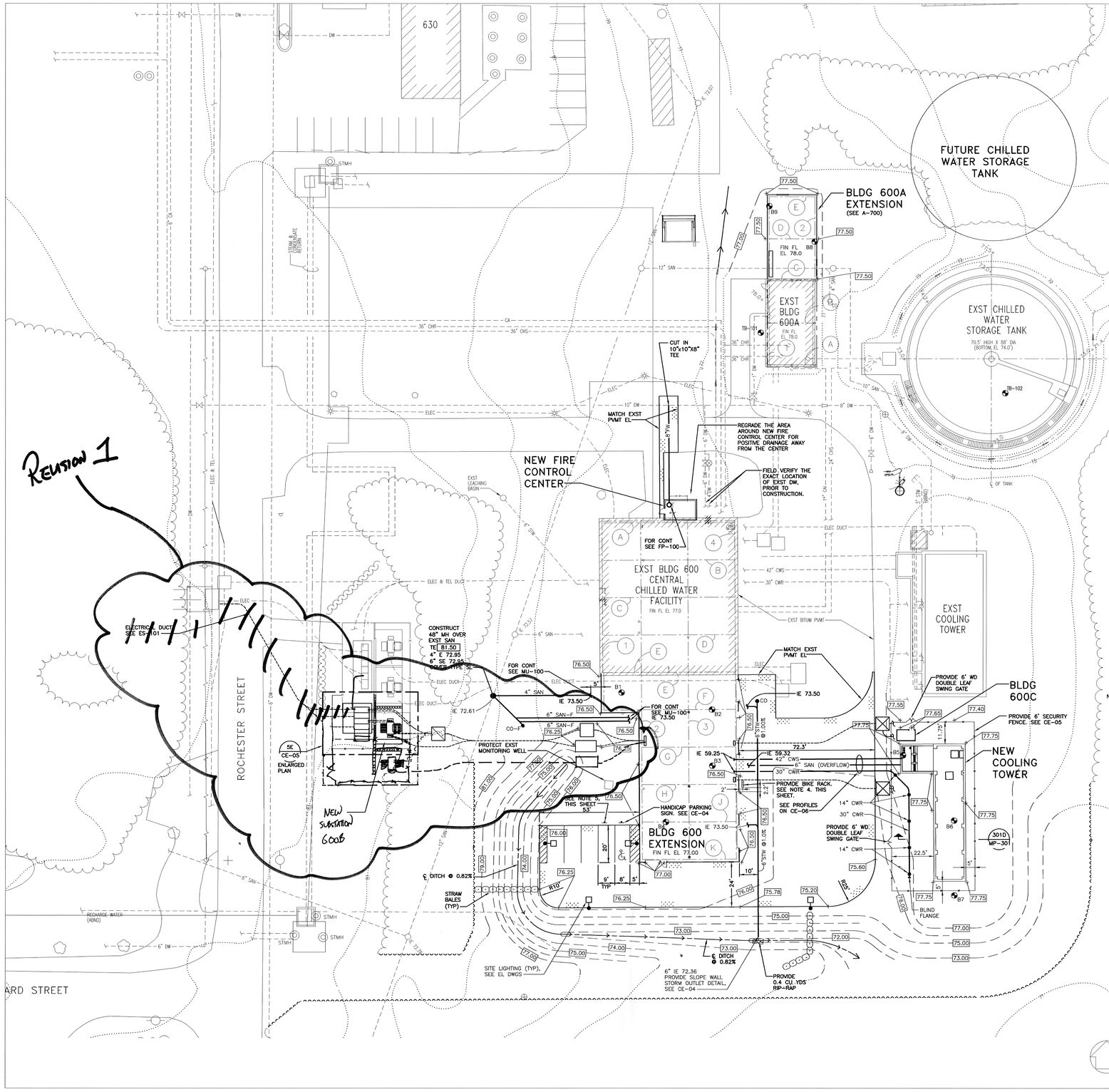
BNL CCWF II
Addendum 2
Revised Drawings

Date (mmm dd yyyy)	Issued For	Rev.
09-21-2007	Title 1 60% Review	A
10-24-2007	Title 1 100 % Complete	B
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
2-19-2009	TITLE II CONSTRUCTION BID ISSUE	G



NOTES:

1) FOR 42" CWS, 6" SAN, AND 30" CWR PROFILE, SEE CE-06
2) FOR LOCATION OF NEW COOLING TOWER, SEE M-104.
3) FOR UNDERGROUND PIPING AT COOLING TOWER, SEE MP-105.
4) PROVIDE BIKE RACK, GALVANIZED WITH IN GROUND ANCHOR (MOUNT RIBBON RACK MODEL #11-IG OR APPROVED EQUAL.
5) PROVIDE RESERVED PARKING SIGN FOR LOW-EMITTING AND FUEL EFFICIENT VEHICLE.
6) FOR LAYOUT, SEE ELECTRICAL PLAN ES-402 AND FOR FOUNDATION DETAILS, SEE CE-05.

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.

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JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	CK
		A Addendum #2	4/14/09			

BROOKHAVEN
NATIONAL LABORATORY

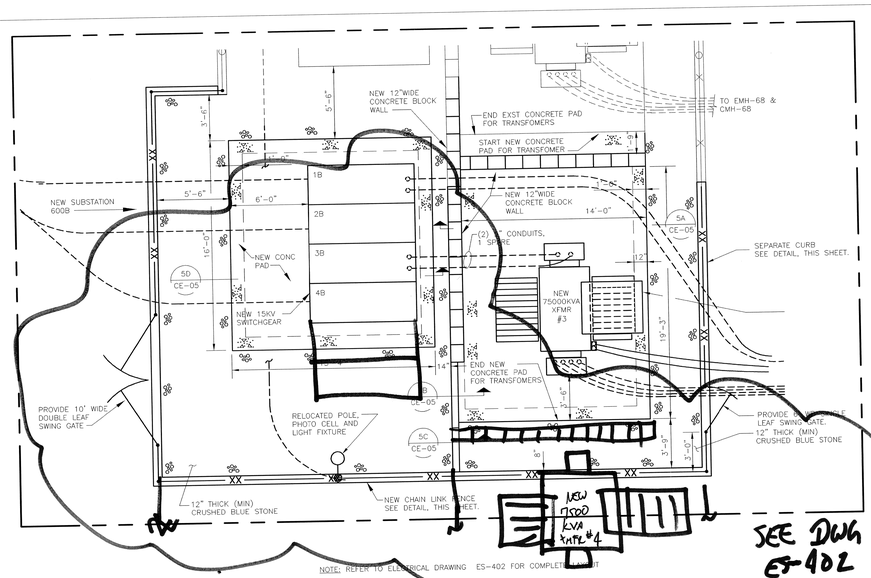
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II		DWG. TITLE: SITE PLAN	
R.R.GPP,J.M., HEM	DATE	ACCT. NO.	SHEET OF
SCALE 1"=20'-0"	DWN. BY SSK / REV'D BY XX	JOB NO. 11705	DWG. NO. CE-03
ESHQ RISK LEVEL	APP'D. BY	BLDG. NO. 600	
PATH:			

Giffels, Partnership
25200 Telegraph Road, Suite 200
Southfield, Michigan 48033 USA
Tel. 248-936-8000
Fax 248-936-8111

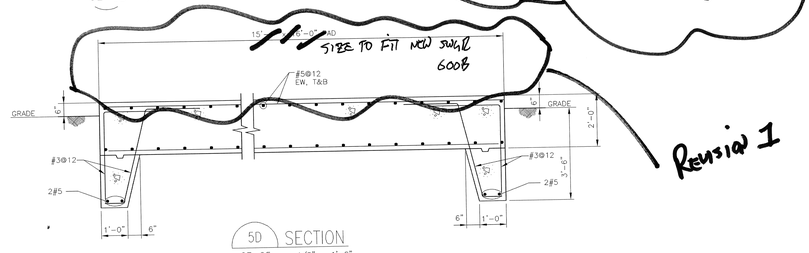
Approved By: W KUSSRO
Project Manager: G KAPLAN
Project Engineer/Architect: S KAHLON
Project No.: SF070003

Date (mmm dd yyyy)	Issued For	Rev.
07-31-2008	TITLE II DESIGN 90% REVIEW SUBMITTAL	E
08-25-2008	TITLE II DESIGN 100% OWNER REVIEW	F
2-19-2009	TITLE II CONSTRUCTION BID ISSUE	G

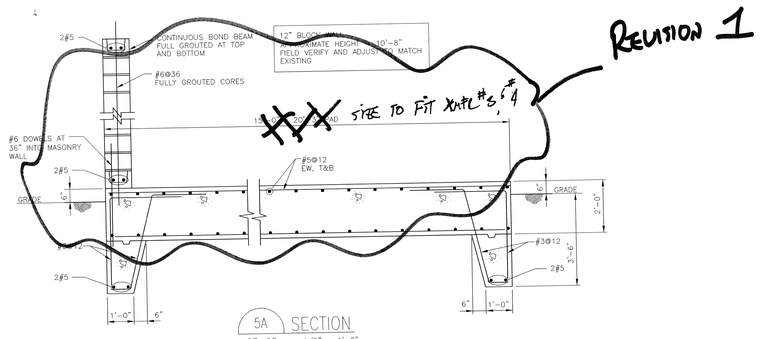


NOTE: REFER TO ELECTRICAL DRAWING ES-402 FOR COMPLETE LAYOUT

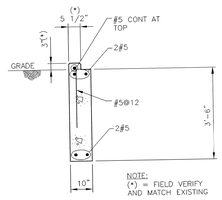
5E / CE-03 PARTIAL SUBSTATIONS ENLARGED PLAN 600A & 600B 1/4" = 1'-0"



5D / CE-05 SECTION 1/2" = 1'-0"

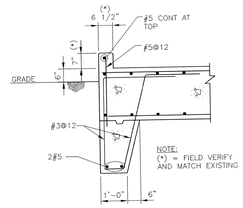


5A / CE-05 SECTION 1/2" = 1'-0"



NOTE: (*) = FIELD VERIFY AND MATCH EXISTING

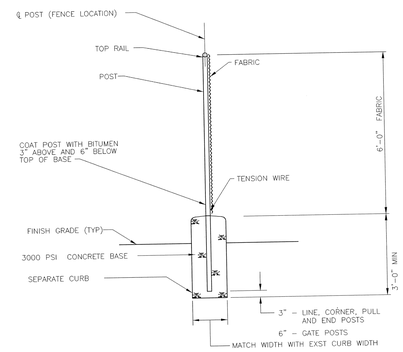
5C / CE-05 SECTION 1/2" = 1'-0"



NOTE: (*) = FIELD VERIFY AND MATCH EXISTING

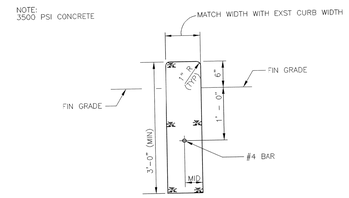
FOR PAD AND GRADE BEAM REINFORCEMENT SEE SECTION "5A" THIS SHEET

5B / CE-05 SECTION 1/2" = 1'-0"

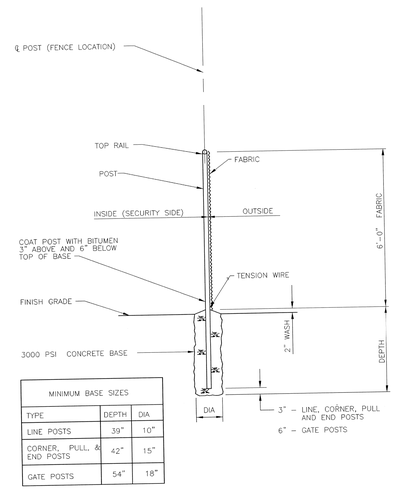


CHAIN LINK FENCE

(AROUND SUB STATION)



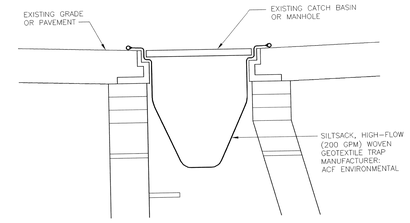
SEPARATE CURB



MINIMUM BASE SIZES		
TYPE	DEPTH	DIA
LINE POSTS	39"	10"
CORNER, PULL, & END POSTS	42"	15"
GATE POSTS	54"	18"

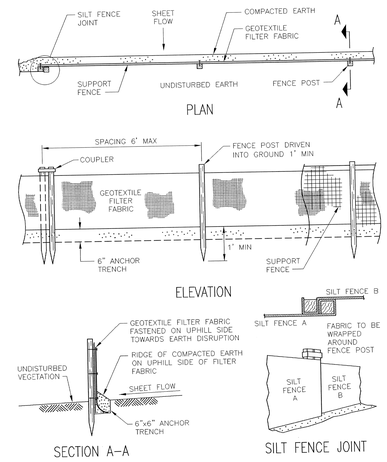
SECURITY FENCE

(AROUND NEW COOLING TOWER)

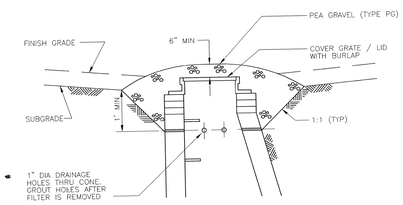


AT EXISTING CATCH BASIN OR MH

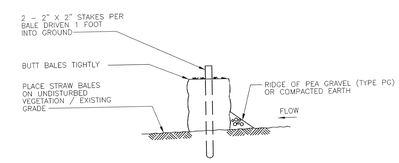
INLET TRAP & FILTER



SILT FENCE



STONE INLET FILTER



STRAW BALE BERM

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. Reproduction of this drawing and related fees are transmitted by the Owner, Owner's Agent or Contractor to the Authority Having Jurisdiction.

JOB NO.	SHEET NO.	REVISION	DATE	DWG.	APP'D.	QA
			10/30/09			

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH UNITED STATES DEPARTMENT OF ENERGY PLANT ENGINEERING DIVISION UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II		DWG. TITLE: SITE DETAILS	
LR,GPP,UNL, HEM	DATE	ACCT. NO.	SHEET OF
SCALE	DWN. BY: SSK / REV'D BY: XX	JOB NO. 11705	DWG. NO. CE-05
ESHQ RISK LEVEL	APP'D. BY	BLDG. NO. 600	
PATH:			

Giffels, Partnership
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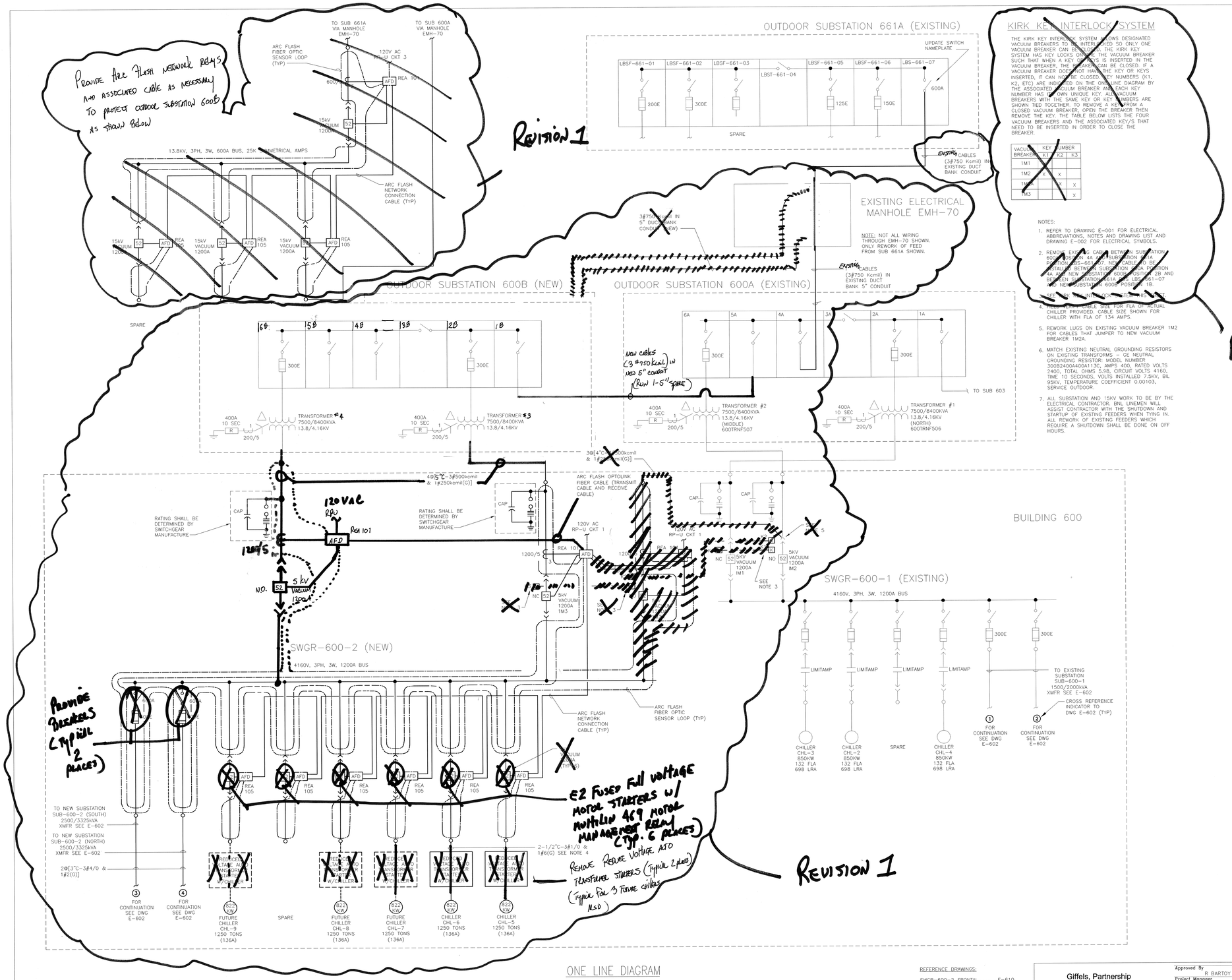
Fax. 248-936-8111

Approved By: W. KUSSRO
Project Manager: G. KAPLAN
Project Engineer/Architect: S. KAHLON
Project No.: SF070003

Date (mmm dd yyyy)	Issued For	Rev.
09–21–2007	TITLE 1 60% REVIEW	A
10–24–2007	TITLE 1 100% COMPLETE	B
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	G



KIRK KEY INTERLOCK SYSTEM

THE KIRK KEY INTERLOCK SYSTEM ALLOWS DESIGNATED VACUUM BREAKERS TO BE INTERLOCKED SO ONLY ONE VACUUM BREAKER CAN BE CLOSED. THE KIRK KEY SYSTEM HAS KEY LOCKS ON THE VACUUM BREAKER SUCH THAT WHEN A KEY OR KEYS IS INSERTED IN THE VACUUM BREAKER, THE VACUUM BREAKER CAN BE CLOSED. IF A VACUUM BREAKER DOES NOT HAVE THE KEY OR KEYS INSERTED, IT CAN NOT BE CLOSED. KEY NUMBERS (K1, K2, ETC) ARE INDICATED ON THE ONE LINE DIAGRAM BY THE ASSOCIATED VACUUM BREAKER AND EACH KEY NUMBER HAS ITS OWN UNIQUE KEY. ALL VACUUM BREAKERS WITH THE SAME KEY OR KEY NUMBERS ARE SHOWN TIED TOGETHER. TO REMOVE A KEY FROM A CLOSED VACUUM BREAKER, OPEN THE BREAKER THEN REMOVE THE KEY. THE TABLE BELOW LISTS THE FOUR VACUUM BREAKERS AND THE ASSOCIATED KEY/S THAT NEED TO BE INSERTED IN ORDER TO CLOSE THE BREAKER.

VACUUM BREAKER	KEY NUMBER K1	K2	K3
1M1			
1M2	X		
1M2A		X	
1M3			X

NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL ABBREVIATIONS, NOTES AND DRAWING LIST AND DRAWING E-002 FOR ELECTRICAL SYMBOLS.
2. REMOVE EXISTING CABLE BETWEEN SUBSTATION 600B POSITION 4A AND SUBSTATION 661A POSITION LBSS-661-07. REMOVE CABLE TO BE INSTALLED BETWEEN SUBSTATION 600A POSITION 4A AND NEW SUBSTATION 600B POSITION 2B AND BETWEEN SUBSTATION 661A POSITION LBS-661-07 AND NEW SUBSTATION 600B POSITION 1B.
3. [illegible] SEE NOTE 3 FOR [illegible]
4. [illegible] CABLE SIZE FOR FLA OF ACTUAL CHILLER PROVIDED. CABLE SIZE SHOWN FOR CHILLER WITH FLA OF 134 AMPS.
5. REWORK LUGS ON EXISTING VACUUM BREAKER 1M2 FOR CABLES THAT JUMPER TO NEW VACUUM BREAKER 1M2A.
6. MATCH EXISTING NEUTRAL GROUNDING RESISTORS ON EXISTING TRANSFORMS – GE NEUTRAL GROUNDING RESISTOR: MODEL NUMBER 30GB400A400A113C, AMPS 400, RATED VOLTS 2400, TOTAL OHMS 5.98, CIRCUIT VOLTS 4160, TIME 10 SECONDS, VOLTS INSTALLED 7.5kV, BIL 95kV, TEMPERATURE COEFFICENT 0.00103, SERVICE OUTDOOR.
7. ALL SUBSTATION AND 15KV WORK TO BE BY THE ELECTRICAL CONTRACTOR. BNL LINEMEN WILL ASSIST CONTRACTOR WITH THE SHUTDOWN AND STARTUP OF EXISTING FEEDERS WHEN TYING IN. ALL REWORK OF EXISTING FEEDERS WHICH REQUIRE A SHUTDOWN SHALL BE DONE ON OFF HOURS.

Revision 1

ONE LINE DIAGRAM

SCALE: NONE

REFERENCE DRAWINGS:

SWGR-600-2 FRONTAL..... E-610

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JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	DA
		1 Addendum #2	11/6/01			

Giffels, Partnership
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Southfield, Michigan 48033 USA
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Approved By: R BARTOY
Project Manager: C KAPLAN
Project Engineer/Architect: J BOSSORY
Project No. SF070003

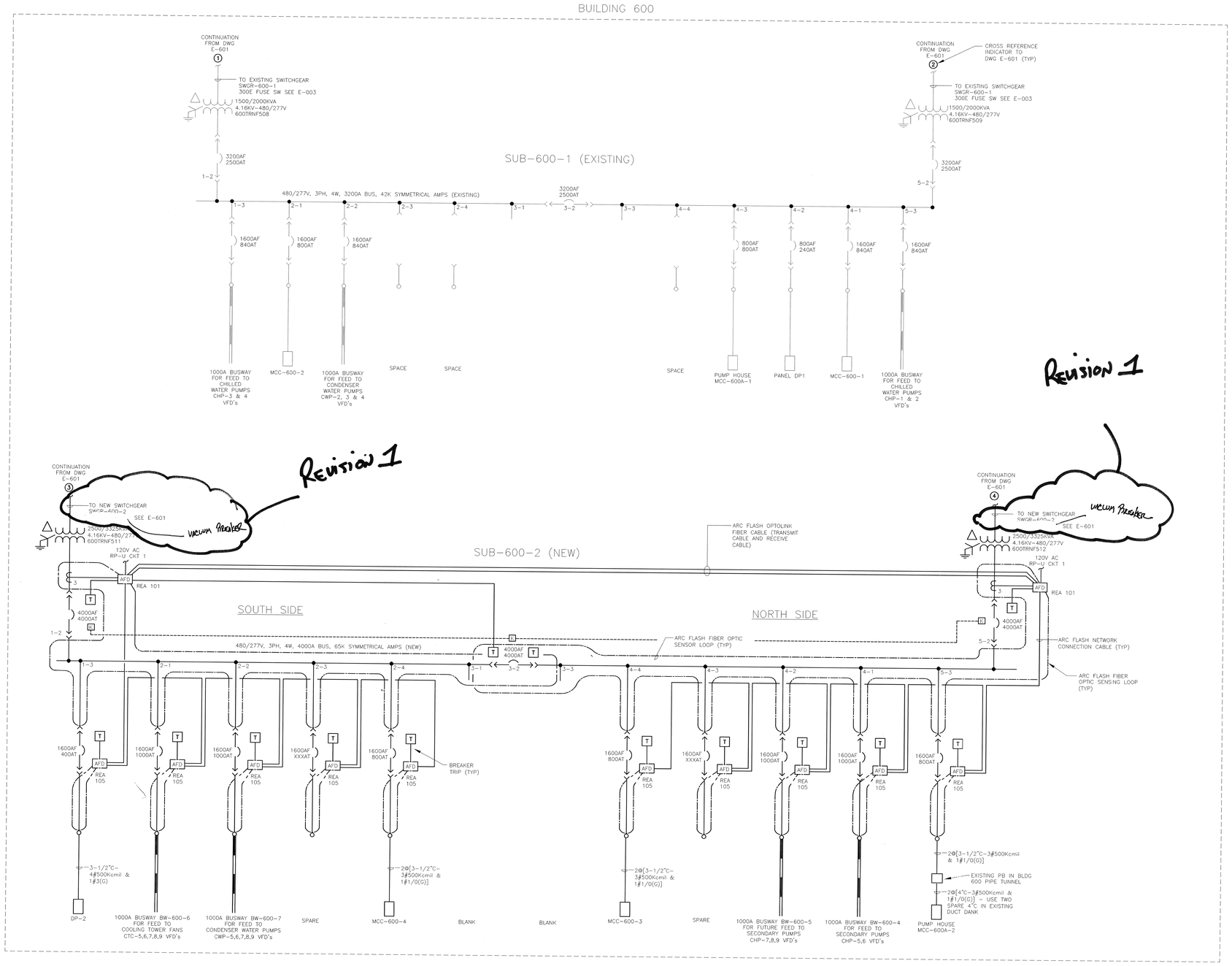
BROOKHAVEN NATIONAL LABORATORY
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II

DWG. TITLE: ONE LINE DIAGRAM

ELR,GPP,LNS, HEM	DATE	ACCT. NO.	SHEET OF
SCALE: NONE	DWN. BY: G SELL / REV'D BY: RB	JOB NO.: 11705	DWG. NO.: E-601
ESHQ RISK LEVEL	APP'D. BY: R BARTOY	BLDG. NO.: 600	
PATH:			

Date (mmm dd yyyy)	Issued For	Rev.
09-21-2007	TITLE I 60% REVIEW	A
10-24-2007	TITLE I 100% COMPLETE	B
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	G



ONE LINE DIAGRAM

SCALE: NONE

REFERENCE DRAWINGS:

SUB-600-2 FRONTAL..... E-610

NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL ABBREVIATIONS, NOTES AND DRAWING LIST AND DRAWING E-002 FOR ELECTRICAL SYMBOLS.

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JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA
	1	Addendum #2	9/8/09			

BROOKHAVEN NATIONAL LABORATORY

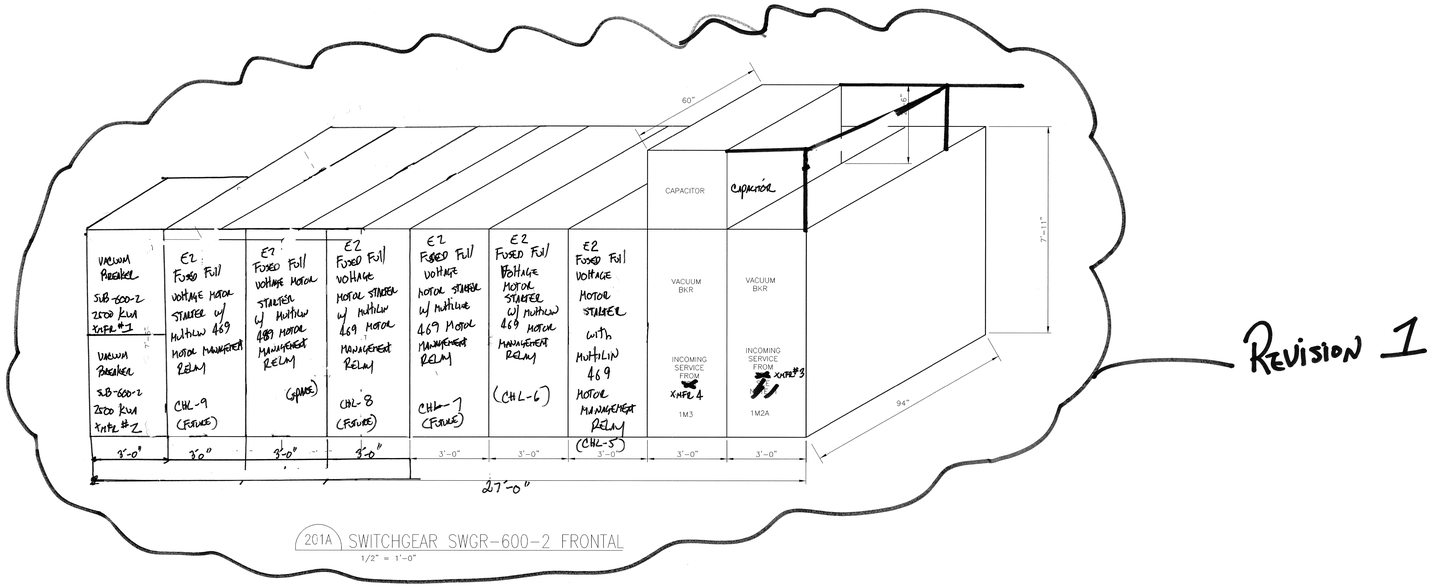
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

Giffels, Partnership
25200 Telegraph Road, Suite 200
Southfield, Michigan 48033 USA
Tel. 248-936-8500
Fax 248-936-8111

Approved By: R BARTOY
Project Manager: G. KAPLAN
Project Engineer/Architect: J BOSSORY
Project No. SF070003

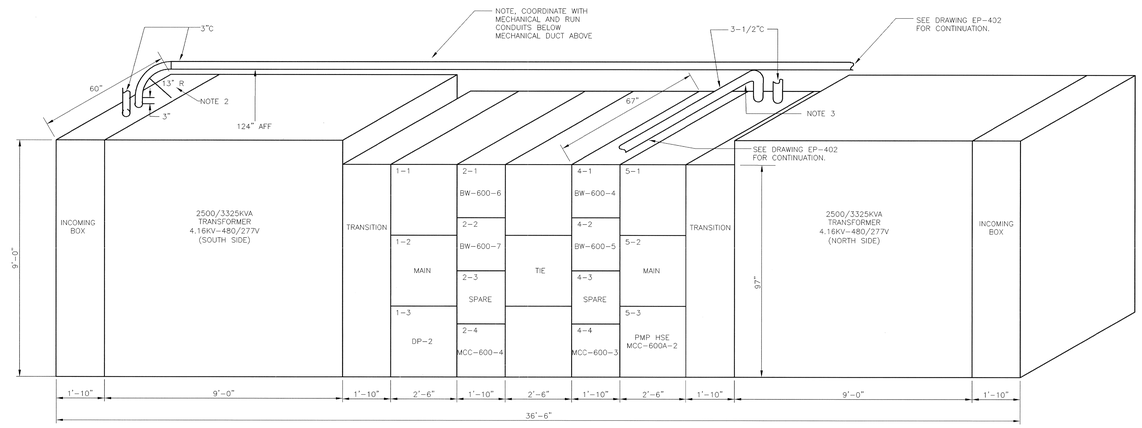
JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II			DWG. TITLE: ONE LINE DIAGRAM
R.R./OPP./LNS. HEM	DATE	ACCT. NO.	SHEET OF
SCALE: NONE	DWN. BY: G. SELL / REV'D BY: RB	JOB NO.: 11705	DWG. NO.: E-602
ESH&I RISK LEVEL	APP'D. BY: R BARTOY	BLDG. NO.: 600	
PATH:			

Date (mmm dd yyyy)	Issued For	Rev.
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



201A SWITCHGEAR SWGR-600-2 FRONTAL
1/2" = 1'-0"

Revision 1



201B SUBSTATION SUB-600-2 FRONTAL
1/2" = 1'-0"

Revision 1

NOTES

1. [illegible]
2. USE ONE SHOT OR FULL SHOE BENDERS TO MAKE 13" BEND RADIUS – REFER TO NEC CHAPTER 9 TABLE 2.
3. USE ONE SHOT OR FULL SHOE BENDERS TO MAKE 15" BEND RADIUS – REFER TO NEC CHAPTER 9 TABLE 2. ROUTE TWO 3-1/2"C FOR FEED TO MCC-600A-2 BELOW TWO 3"C.

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JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA
		1 Alleadun #2	4/13/09			

BROOKHAVEN
NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II	DWG. TITLE: SWGR & SUBSTATION FRONTAL DIAGRAMS
R.R.GPP,J.NL, HEM	DATE
ACCT. NO.	SHEET OF
SCALE: AS NOTED	DWN. BY: EA; REV'D BY: RB
JOB NO.: 11705	DWG. NO.: E-610
ESHQ RISK LEVEL	APP'D. BY: R BARTOY
BLDG. NO.: 600	
PATH:	

Giffels, Partnership
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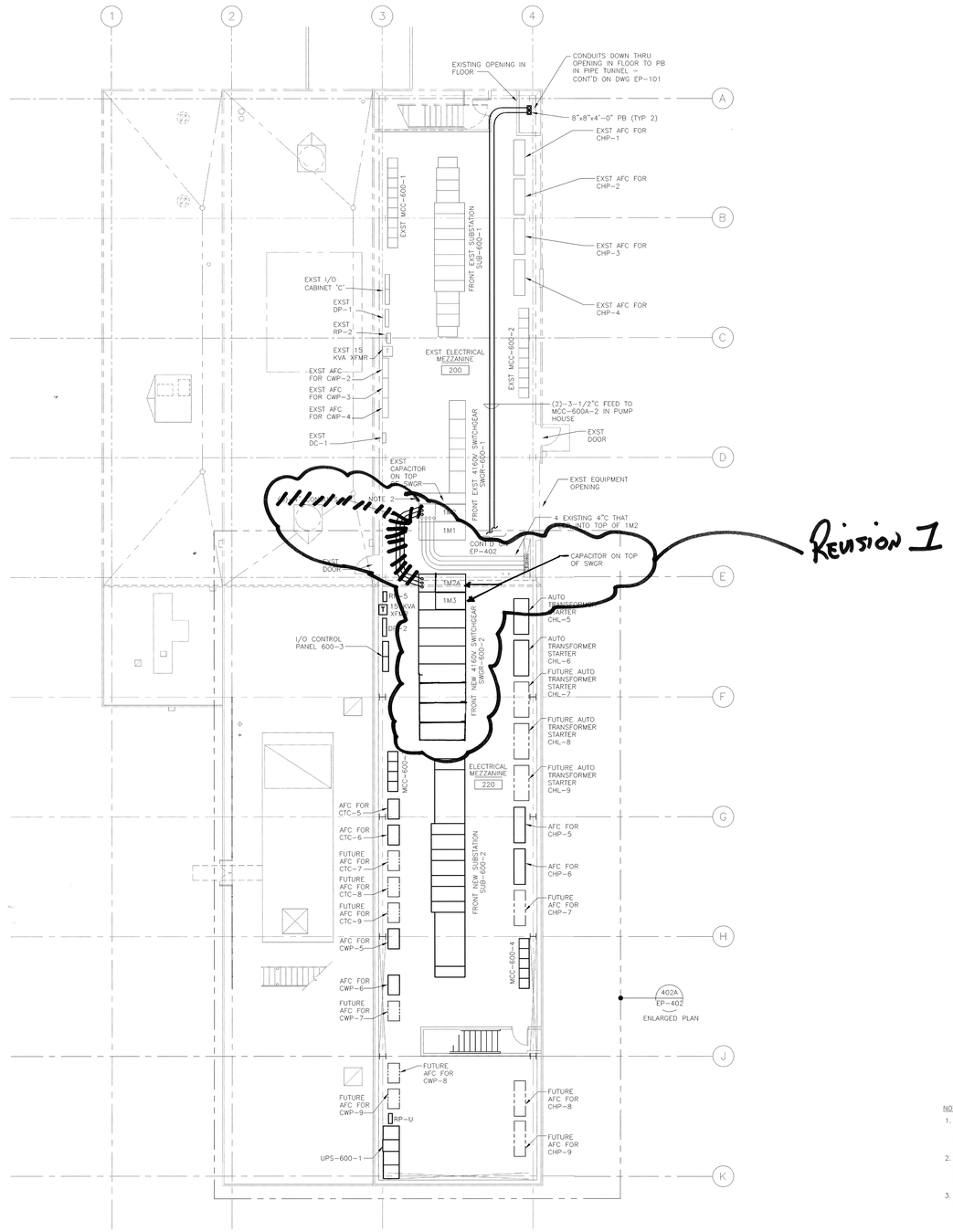
Fax 248-936-8111

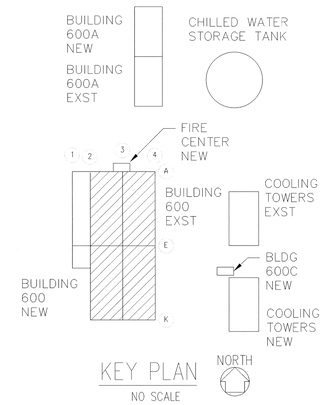
Approved By: R BARTOY
Project Manager: G. KAPLAN
Project Engineer/Architect: J BOSSORY
Project No.: SF070003

Date (mmm dd yyyy)	Issued For	Rev.
09-21-2007	TITLE I 60% REVIEW	A
10-22-2007	TITLE I 100% COMPLETE	B
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



BUILDING 600 POWER PLAN ELECTRICAL MEZZ

SCALE: 1/8" = 1'-0"



KEY PLAN

NO SCALE

This drawing has been prepared solely for the use of Brookhaven National Laboratory and there are no representations of any kind made to any other 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 registered professional engineer has been applied and all required fees are transmitted by the Owner, Owner's Agent or Contractor to the Authority Having Jurisdiction.

NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL ABBREVIATIONS, GENERAL NOTES AND DRAWING LIST AND DRAWING E-002 FOR ELECTRICAL SYMBOLS.
2. REWORK LUGS ON VACUUM BREAKER 1M2 FOR CABLES THAT JUMPER TO NEW VACUUM BREAKER 1M2A – SEE ONE LINE DIAGRAM DRAWING E-601.
3. ALL EQUIPMENT DESIGNATED FUTURE ARE NOT PART OF THIS CONTRACTOR.

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Tel. 248-936-8000
Fax 248-936-8111

Approved By: R BARTOY
Project Manager: G KAPLAN
Project Engineer/Architect: J BOSSORY
Project No. SF070003

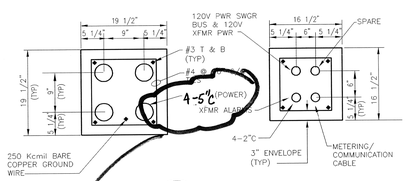
JOB NO.	SHEET	NO.	REVISION	DATE	DWN.	APP'D.	QA
		1	Addendum #2	4/30/09			

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

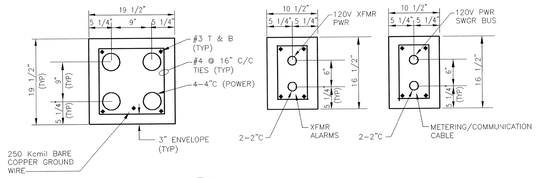
JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II		DWG. TITLE: POWER PLAN ELECTRICAL MEZZ	
E/L/EQPT/LINE, ITEM	DATE	ACCT. NO.	SHEET OF
SCALE: 1/8" = 1'-0"	DWN. BY: EA / REV'D. BY: RB	JOB NO.: 11705	DWG. NO.: EP-102
ESHQ RISK LEVEL	APP'D. BY: R BARTOY	BLDG. NO.: 600	
PATH:			

Date (mmm dd yyyy)	Issued For	Rev.
08-25-2008	TITLE II DESIGN 100% OWNER REVIEW	F
02-19-2009	TITLE II CONSTRUCTION BID ISSUE	0

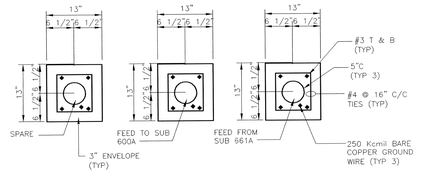


D SECTION
ES-101 SCALE 1" = 1'-0"

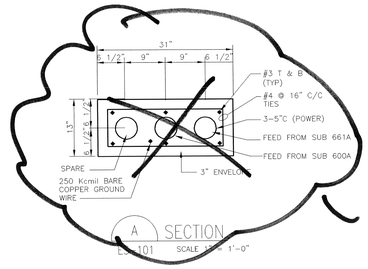
REVISION 1



C SECTION
ES-101 SCALE 1" = 1'-0"



B SECTION
ES-101 SCALE 1" = 1'-0"



A SECTION
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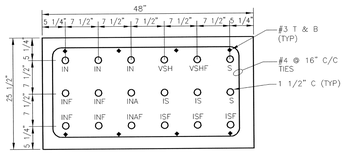
REVISION 1



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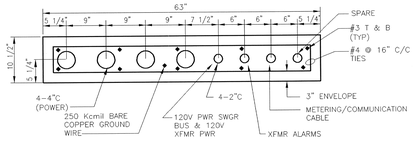

G SECTION
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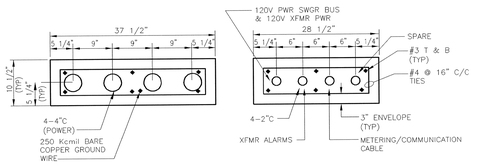

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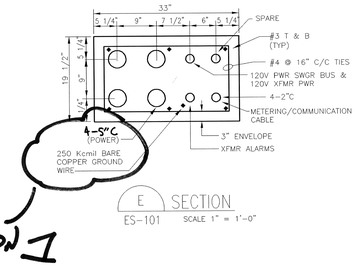

REVISION 1

E SECTION
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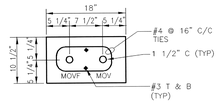

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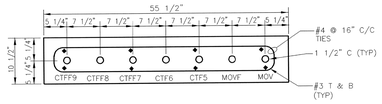

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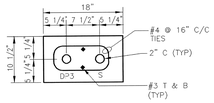

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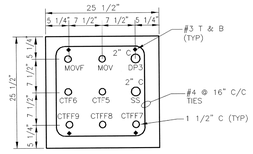

J SECTION
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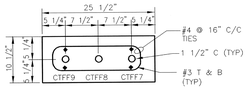
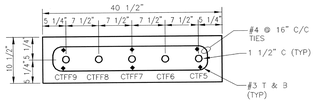


O SECTION
ES-401 SCALE 1" = 1'-0"



N SECTION
ES-401 SCALE 1" = 1'-0"

LEGEND

CTF CONDUIT BETWEEN COOLING TOWER FAN MOTORS AND ADJUSTABLE FREQUENCY CONTROLLERS ON ELECTRICAL MEZZANINE
NOTE: CONDUIT UP THRU OPENING IN OPERATING FLOOR THRU SLEEVES IN ELECTRICAL MEZZANINE FLOOR FOR BOTTOM ENTRY INTO DRIVE.

CTFF FUTURE CONDUIT BETWEEN FUTURE COOLING TOWER FAN MOTORS AND FUTURE ADJUSTABLE FREQUENCY CONTROLLERS ON ELECTRICAL MEZZANINE. AT COOLING TOWER TAKE CONDUIT TO FUTURE LOCATION OF TOWERS AND STUB-UP AND CAP AT ENTRY INTO PIPE TUNNEL LEVEL. TURN CONDUIT UP THRU OPENING IN OPERATING FLOOR AND CAP FOR FUTURE EXTENSION TO DRIVES.

DP3 CONDUIT FROM MCC-600-3 TO PANEL DP-3, BLDG 600C.

IN CONDUIT BETWEEN I/O CONTROL PANEL 600-IN AND DI/DO JUNCTION BOX AT COOLING TOWERS FOR CELLS 5 AND 6 DISCRETE CABLES.

INA CONDUIT BETWEEN I/O CONTROL PANEL 600-IN AND AI JUNCTION BOX AT COOLING TOWERS FOR CELLS 5 AND 6 DISCRETE CABLES.

INAF CONDUIT BETWEEN I/O CONTROL PANEL 600-IN AND AI JUNCTION BOX AT COOLING TOWERS FOR FUTURE CELLS 7, 8 AND 9 ANALOG CABLES.
NOTE: TAKE DUCT BANK CONDUIT INTO PIPE TUNNEL LEVEL AND CAP FOR FUTURE EXTENSION TO I/O PANEL.

INF CONDUIT BETWEEN I/O CONTROL PANEL 600-IN AND DI/DO JUNCTION BOX AT COOLING TOWERS FOR FUTURE CELLS 7, 8 AND 9 DISCRETE CABLES.
NOTE: TAKE DUCT BANK CONDUIT INTO PIPE TUNNEL LEVEL AND CAP FOR FUTURE EXTENSION TO I/O PANEL.

MOV CONDUIT FROM MCC-600-3 TO MOV'S 714, 715 AND 716.

MOVF FUTURE CONDUIT FROM MCC-600-3 TO FUTURE COOLING TOWER MOV'S
NOTE: TAKE DUCT BANK CONDUIT INTO BUILDING 600 AND STUB-UP ABOVE OPERATING LEVEL FLOOR AND CAP. AT COOLING TOWER, TAKE CONDUIT TO FRONT OF CELL 6 AND CAP FOR FUTURE EXTENSION.

IS CONDUIT BETWEEN I/O CONTROL PANEL 600-1S AND DI/DO JUNCTION BOX AT COOLING TOWERS FOR CELLS 5 AND 6 DESCRETE CABLES.

ISF CONDUIT BETWEEN I/O CONTROL PANEL 600-1S AND DI/DO JUNCTION BOX AT COOLING TOWERS FOR FUTURE CELLS 7, 8 AND 9 DISCRETE CABLES.
NOTE: TAKE DUCT BANK CONDUIT INTO PIPE TUNNEL LEVEL AND CAP FOR FUTURE EXTENSION TO I/O PANEL.

S SPARE CONDUIT - BRING INTO PIPE TUNNEL LEVEL AND CAP.

SS SPARE CONDUIT - BRING CONDUIT INTO PIPE TUNNEL THEN UP THRU OPENING IN OPERATING LEVEL FLOOR AND CAP.

VSH CELL 5 & 6 COOLING TOWERS FAN VIBRATION SWITCHES AND MOTOR HEATERS CONDUIT TO ADJUSTABLE FREQUENCY CONTROLLER ON ELECTRICAL MEZZANINE.
NOTE: CONDUIT UP THRU OPERATING LEVEL FLOOR OPENING THRU SLEEVE IN ELECTRICAL LEVEL MEZZANINE FLOOR FOR BOTTOM ENTRY INTO DRIVES.

VSHF FUTURE COOLING TOWERS CELLS 7, 8 & 9 FAN VIBRATION SWITCHES AND MOTOR HEATERS CONDUIT TO COOLING TOWER FAN MOTOR ADJUSTABLE FREQUENCY CONTROLLERS.
NOTE: AT COOLING TOWER STUB-UP CONDUIT AT CONTAINMENT WALL AND CAP FOR FUTURE EXTENSION TO FUTURE CELLS 7, 8 & 9. AT ENTRY INTO PIPE TUNNEL LEVEL, TURN CONDUIT UP THRU OPENING IN OPERATING FLOOR AND CAP FOR FUTURE EXTENSION TO DRIVES FOR CELLS 7, 8 AND 9 FAN MOTORS.

NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL ABBREVIATIONS, GENERAL NOTES AND DRAWING LIST AND DRAWING E-002 FOR ELECTRICAL SYMBOLS.

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Approved By
Project Manager C. KAPLAN
Project Engineer/Architect
Project No. SF070003

JOB NO	SHEET NO	REVISION	DATE	DWN.	APP'D.	DA
			4/2/09			

BROOKHAVEN NATIONAL LABORATORY
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE	DWG. TITLE
CENTRAL CHILLED WATER FACILITY PHASE II	ELECTRICAL SECTIONS

E.R.G.P.P.J.N.R. HEM	DATE	ACCT. NO.	SHEET OF

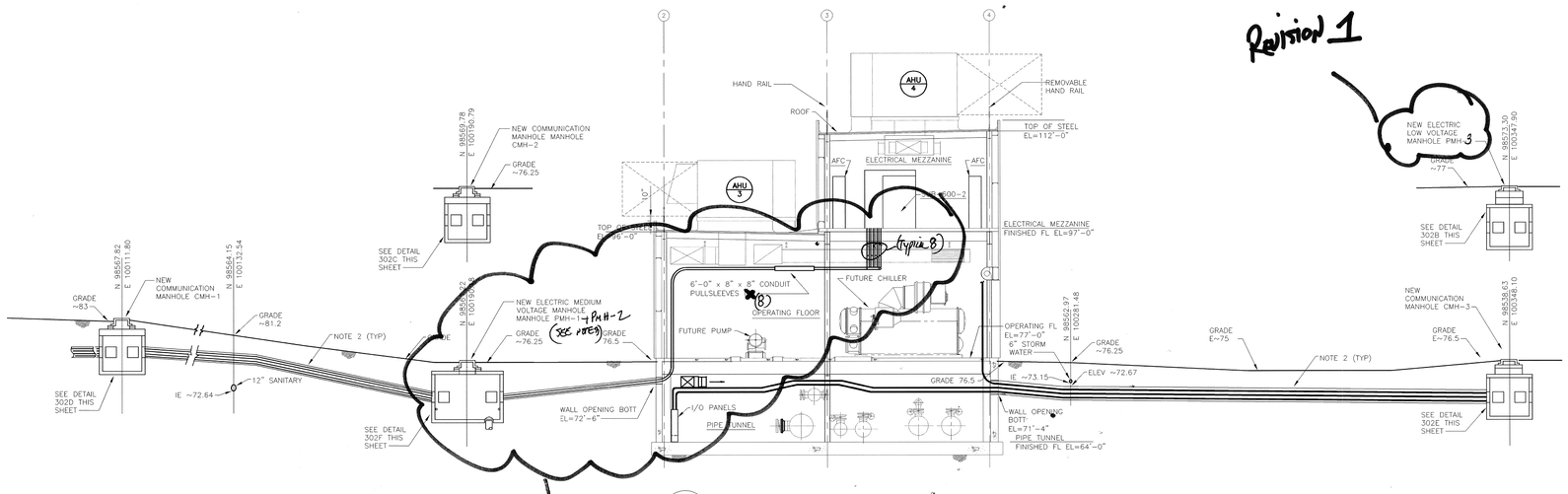
SCALE	DWN. BY	REV'D BY	JOB NO.	DWG. NO.
AS NOTED	EA	RB	11705	EP-301

ES&HQ RISK LEVEL	APP'D. BY	BLDG. NO.
	R BARTOY	600

PATH:

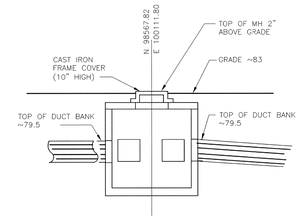
Date (mmm dd yyyy)	Issued For	Rev.
08-25-2008	TITLE II DESIGN 100% OWNER REVIEW	F
02-19-2009	TITLE II CONSTRUCTION BID ISSUE	0

Revision 1

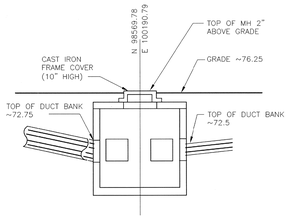


302A BUILDING ELECTRICAL DUCT BANK SECTION
EP-400 EP-401 1/8" = 1'=0"

Revision 1

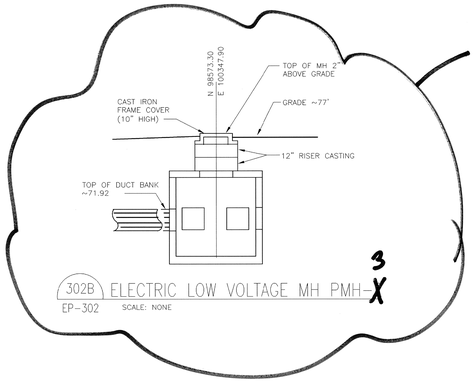


302D COMMUNICATION MH CMH-1
EP-302 SCALE: NONE



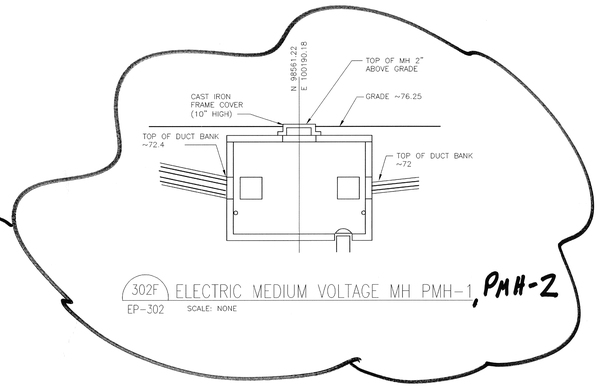
302C COMMUNICATION MH CMH-2
EP-302 SCALE: NONE

Revision 1

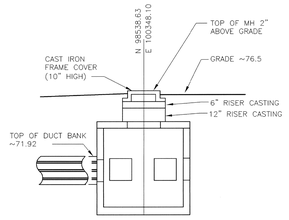


302B ELECTRIC LOW VOLTAGE MH PMH-X 3
EP-302 SCALE: NONE

Revision 1



302F ELECTRIC MEDIUM VOLTAGE MH PMH-1, PMH-2
EP-302 SCALE: NONE



302E COMMUNICATION MH CMH-3
EP-302 SCALE: NONE

Revision 1

NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL ABBREVIATIONS, GENERAL NOTES AND DRAWING LIST AND DRAWING E-002 FOR ELECTRICAL SYMBOLS.
2. TOP OF DUCT BANK TO BE MINIMUM OF 30 INCHES BELOW GRADE WITH MINIMUM SLOPE OF 12 INCHES PER 100 FEET.
3. DUCTBANK ASSOCIATED WITH PMH-2 INSTALLED AT XMPR #4 AND ENDS AT SUB-600-2 ON ELECTRICAL MEZZANINE, SEE DWG. ES-101 FOR FURTHER DETAILS

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Approved By: R. BARTOY
Project Manager: G. KAPLAN
Project Engineer/Architect: J. BOSSORY
Project No.: SF070003

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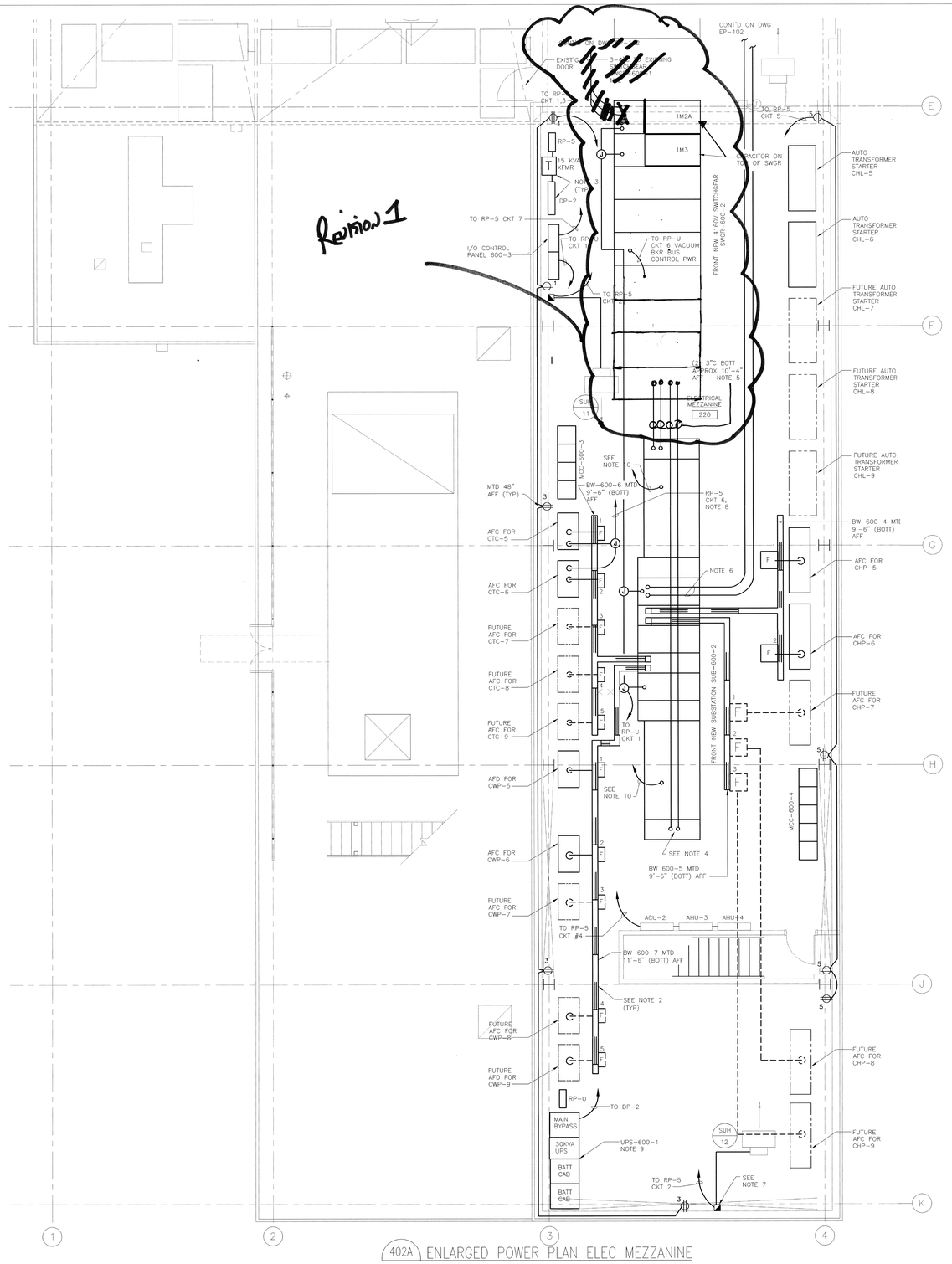
JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	GA
		R. Abbraham #2	9/26/09			

BROOKHAVEN NATIONAL LABORATORY
UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE	DWG. TITLE
CENTRAL CHILLED WATER FACILITY PHASE II	ELECTRICAL SECTIONS

ILR,GPP,LNG, HEM	DATE		ACCT. NO.	SHEET OF
SCALE AS NOTED	DWN. BY EA	REV'D BY RB	JOB NO. 11705	DWG. NO. EP-302
ESHQ RISK LEVEL	APP'D. BY R BARTOY		BLDG. NO. 600	
PATH:				

Date (mmm dd yyyy)	Issued For	Rev.
09-24-2007	TITLE I 100% REVIEW	B
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% REVIEW SUBMITTAL	F
02-19-2009	TITLE II CONSTRUCTION BID ISSUE	G



402A ENLARGED POWER PLAN ELEC MEZZANINE
EP-102 1/4" = 1'-0"

Revision 1

Revision 1

NOTES:

1. REFER TO DRAWING E-001 FOR ELECTRICAL ABBREVIATIONS, GENERAL NOTES AND DRAWING LIST AND DRAWING E-002 FOR ELECTRICAL SYMBOLS.
2. BUSWAY DESIGNED AROUND GE SPECTRA SERIES BUSWAY.
3. MAINTAIN A MINIMUM OF FIVE FEET (WORKING SPACE) BETWEEN 4160 VOLT SWITCHGEAR AND EQUIPMENT AGAINST WALL.
4. LOW POINT OF MECHANICAL DUCT ABOVE IS 11'-2" (INCLUDES HANGER SPACE). SEE SUBSTATION SUB-600-2 FRONTAL DRAWING E-610 WHICH SHOWS TYPICAL 17" CLEARANCE.
5. FEEDS TO NORTH AND SOUTH ENDS OF SUBSTATION SUB-600-2 FROM [illegible] VACUUM BREAKER SWGR POSITIONS OF SWITCHGEAR SWGR-600-2 - SEE ONE LINE DIAGRAM E-601.
6. SEE [illegible] SUB-600-2 FRONTAL ON DRAWING E-610 WHICH SHOWS THE (2) 3-1/2"C ENTRY INTO THE TOP OF THE SUBSTATION - FOR FEED TO MCC-600A-2 IN THE PUMP HOUSE.
7. MAINTAIN 30" WIDE BY 3'-0" DEEP BY 6'-6" HIGH WORKING SPACE IN FRONT OF EQUIPMENT PER NEC ARTICLE 110.26(A) CONDITION 3 FOR VOLTAGE OF 0-150 VOLTS TO GROUND.
8. 120V THRU DRIVE AUXILIARY CONTACT FOR COOLING TOWER FAN MOTOR HEATER POWER.
9. PROVIDE ONE 30KVA/24KW THREE PHASE UNINTERRUPTIBLE POWER SUPPLY, BATTERY POWER PACKS AND MAINTENANCE BYPASS CABINET AS FOLLOWS:
   I. UNINTERRUPTIBLE POWER SUPPLY WITH 480V INPUT (3PH, 3W PLUS GRD) AND 208/120V OUTPUT (3PH, 4W PLUS GRD) WITH THE FOLLOWING FEATURES:
      a. SINGLE INPUT, TRUE ON-LINE, DOUBLE COVERSION
      b. REVERSE TRANSFER CONFIGURATION
      c. PHASE CONTROLLED RECTIFIER/CHANGER
      d. IGBT PULSE-WIDTH MODULATED (PWM) INVERTER
      e. AUTOMATIC CONTINUOUS DUTY STATIC TRANSFER SWITCH
      f. INTERNAL MAINTENANCE BYPASS SWITCH
      g. DSP (DIGITAL SIGNAL PROCESSING) CONTROLS
      h. MICROPROCESSOR BASED MONITORING AND CONTROL PANEL WITH MIMIC BUS
      i. LCD GRAPHIC DISPLAY WITH ALARM HISTORY DATABASE
      j. PGORAMMABLE BATTERY LOAD TESTING FOR ADDED RELIABILITY
      k. LOAD NEUTRAL ISOLATION
      l. INPUT FILTER WITH 10% THD AT FULL OUTPUT LOAD
      m. 1 OPEN COMMS-DISCRETE OUTPUT OPTION (PROGRAMMABLE RELAY BOARD)
      n. 2 (TWO) INTELLISLOT RELAY INTERFACE KIT
      o. 1 (ONE) IS-WEBLB: INTELLISLOT WEB CARD LB
      p. LOCAL E.P.O. WITH PROVISION FOR REMOTE E.P.O.
      q. RS 232 INTERFACE PORT
      r. CASTERS AND LEVELING FEET
      s. UL 1778, CSA

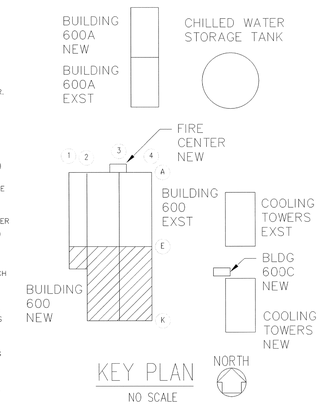
   UPS MODULE SHALL BE LIEBERT MODEL 37SA030A0C6EA05 OR APPROVED EQUAL

   II. TWO BATTERY POWER PACKS RATED AT 90 MINUTES AT 24KW LOAD WITH INTERCONNECTING CABLES TO BOLT TO THE LEFT SIDE OF THE UPS MODULE AND WITH THE FOLLOWING FEATURES:
      a. BATTERY CIRCUIT BREAKER TO ISOLATE THE BATTERIES DURING MAINTENANCE
      b. VALVE REGULATED LEAD ACID BATTERY CELLS IN FLAME RETARDANT CASES
      c. BATTERY TO BE PROVIDED WITH 3 YEAR FULL, AND 7 YEAR PRORATED WARRANTY
      d. BATTERY POWER PACKS SHALL BE LIEBERT MODEL 37BP030XRX1BNL OR APPROVED EQUAL

   III. MAINTENANCE BYPASS CABINET WITH THE FOLLOWING FEATURES:
      a. SINGLE ROTARY HANDLE SWITCH INTERLOCKED FOR "MAKE-BEFORE-BREAK" TRANSFER OF THE LOAD, BYPASS TRANSFORMER WITH INPUT AND OUTPUT CIRCUIT BREAKERS
      b. INCLUDING INTERCONNECTION CABLES TO BOLT TO THE RIGHT SIDE OF THE UPS
      c. CASTERS AND LEVELING FEET.

   MAINTENANCE BYPASS CABINET SHALL BE LIEBERT MODEL 37MB0300AC61Q OR APPROVED EQUAL

10. 3/4"C-2#12 - WIRING FOR CONTACT TO CONTROL ROOM TO INDICATE TRANSFORMER FANS ON. FIELD VERIFY WITH BROOKHAVEN CABLE TERMINATION POINT.



KEY PLAN
NO SCALE

REFERENCE DRAWINGS:

BUSWAY ONE LINE DIAGRAMS..... E-606
DP-2 RISER DIAGRAM..... E-607
RP-5 & RP-U SCHEDULES..... E-607
SWGR-600-2 & E-610
SUB-600-2 FRONTALS

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JOB NO.	SHEET NO.	REVISION	DATE	DWN.	APP'D.	QA
		4 Addendum #2	11/3/09			

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

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25200 Telegraph Road, Suite 200
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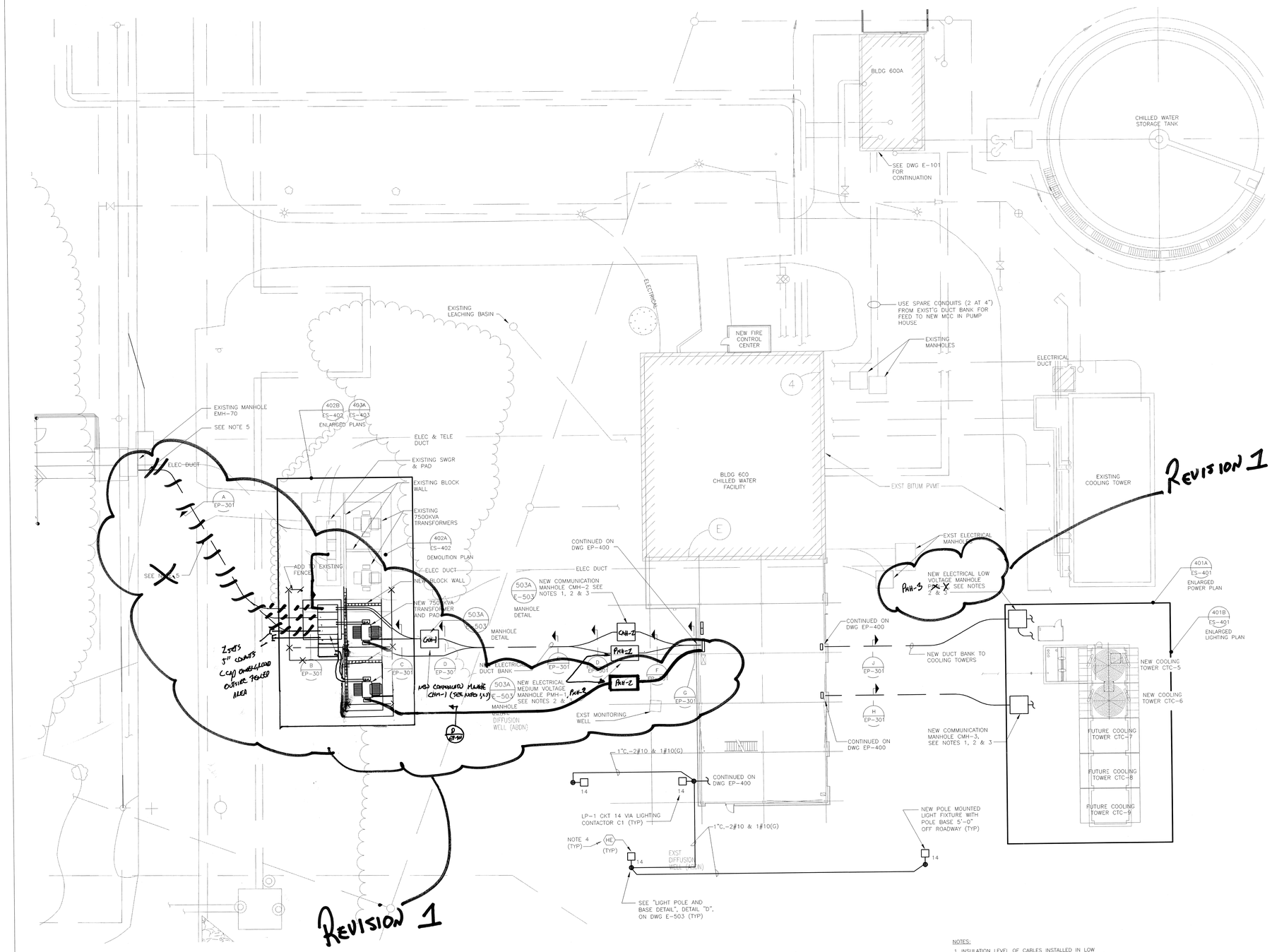
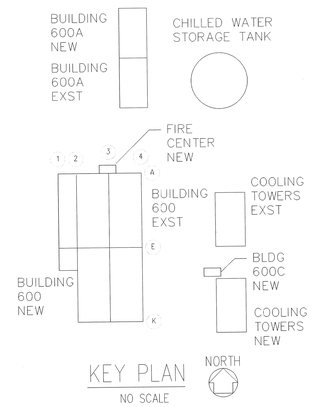
Fax 248-936-8111

Approved By: R BARTOY
Project Manager: G. KAPLAN
Project Engineer/Architect: J BOSSORY
Project No. SF070003

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II		DWG. TITLE: ENLARGED PWR PLAN ELECTRICAL MEZZ	
SUB,GRP,LNG, HEM	DATE	ACCT. NO.	SHEET OF
SCALE 1/8" = 1'-0"	DWN. BY EA / REV'D BY RB	JOB NO. 11705	DWG. NO. EP-402
ESHQ RISK LEVEL	APP'D. BY R BARTOY	BLDG. NO. 600	
PATH:			

Date (mmm dd yyyy)	Issued For	Rev.
09-21-2007	TITLE I 60% REVIEW	A
10-24-2007	TITLE I 100% COMPLETE	B
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	G





KEY PLAN

NO SCALE

ELECTRICAL SITE PLAN

SCALE: 1" = 15'-0"

REVISION 1

NOTES:

1. INSULATION LEVEL OF CABLES INSTALLED IN LOW VOLTAGE MANHOLE SHALL BE PER NEC ARTICLE 775.
2. SEE DRAWING EP-302 FOR MANHOLE LOCATION, ELEVATION AND DUCT BANK ENTRY.
3. SEE BROOKHAVEN NATIONAL LABORATORY FOR ACTUAL MANHOLE NAME AND NUMBER.
4. [illegible] FIXTURE [illegible] REF [illegible] SCHEDULE ON DRAWING E-501 [illegible]
5. CONTRACTOR [illegible] DUCT BANK [illegible] LOCATION [illegible] PER [illegible]

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JOB NO.	SHEET	NO.	REVISION	DATE	DWN.	APP'D.	CK.
			1 Addendum #2	9/9/09			

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

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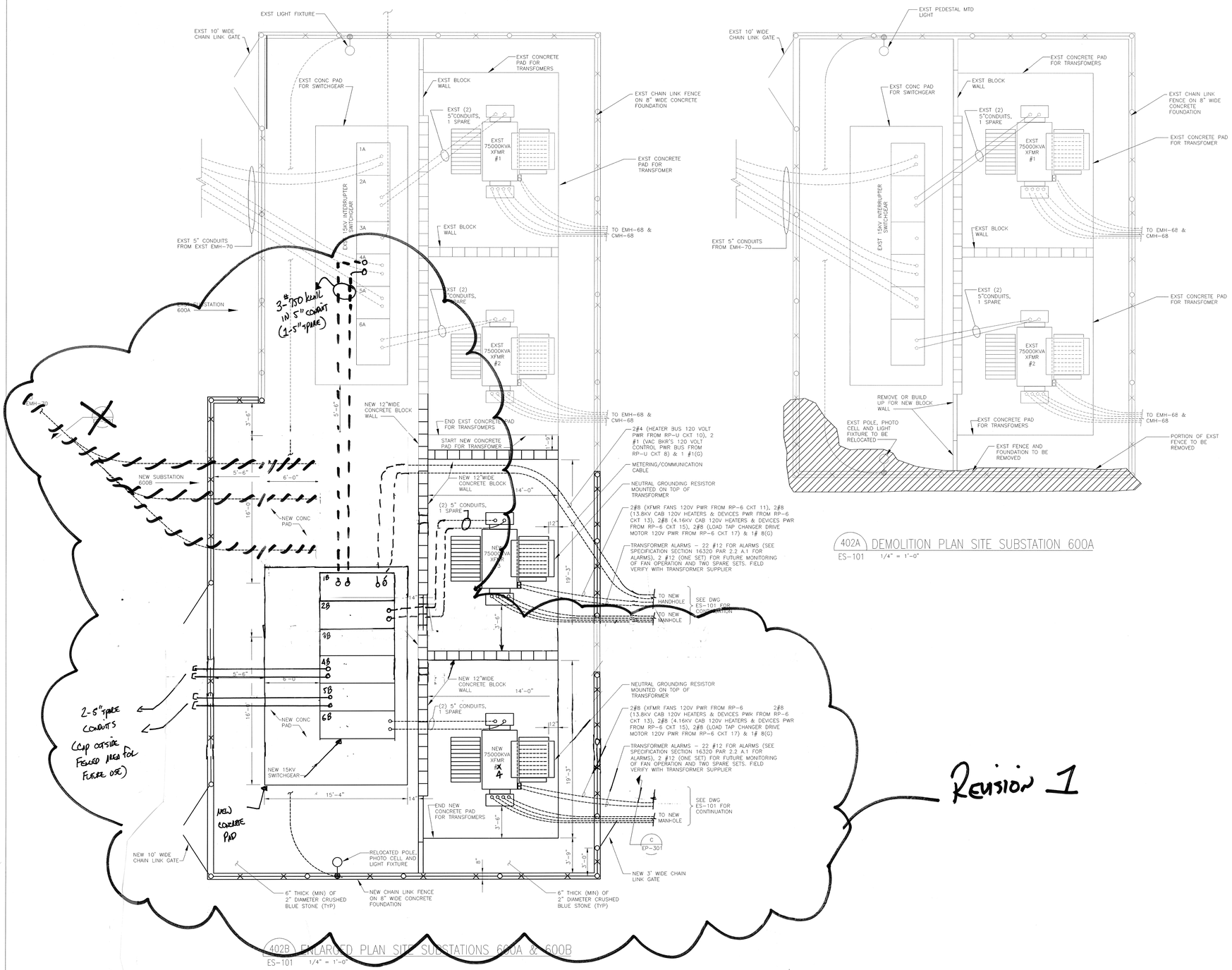
Tel: 248-936-8000
Fax: 248-936-8111

Approved By	R BARTOY
Project Manager	G KAPLAN
Project Engineer/Architect	J BOSSORY
Project No.	SF070003

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II		DWG. TITLE: ELECTRICAL SITE PLAN	
E.R./OPP.I.NG. HEM	DATE	ACCT. NO.	SHEET OF
SCALE: AS NOTED	DWN. BY: EA	REV'D BY: RB	JOB NO.: 11705
ESHQ RISK LEVEL	APP'D. BY: R BARTOY	BLDG. NO.: 600	DWG. NO.: ES-101
PATH:			

Date (mmm 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



402A DEMOLITION PLAN SITE SUBSTATION 600A
ES-101 1/4" = 1'-0"

402B ENLARGED PLAN SITE SUBSTATIONS 600A & 600B
ES-101 1/4" = 1'-0"

Revision 1

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.

JOB NO.	SHEET	NO.	REVISION	DATE	DWN.	APP'D.	QA
		1	Addendum #2	9/26/			

BROOKHAVEN NATIONAL LABORATORY

UNDER CONTRACT WITH
UNITED STATES DEPARTMENT OF ENERGY
PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II

DWG. TITLE: ENLARGED PLAN SITE SUBSTATIONS

R,R,UPP,LNG, HEM	DATE	ACCT. NO.	SHEET OF

SCALE	DWN. BY	REV'D BY	JOB NO.	DWG. NO.
AS NOTED	EA	RB	11705	ES-402
ESHQ RISK LEVEL	APP'D. BY		BLDG. NO.	
	R BARTOY		600	
PATH:				

Giffels, Partnership
25200 Telegraph Road, Suite 200
Southfield, Michigan 48033 USA
Tel. 248-936-8000
Fax 248-936-8111

Approved By: R BARTOY
Project Manager: G. KAPLAN
Project Engineer/Architect: J BOSSORY
Project No. SF070003

Date (mmm dd yyyy)	Issued For	Rev.
12-07-2007	TITLE II DESIGN 30% REVIEW SUBMITTAL	C
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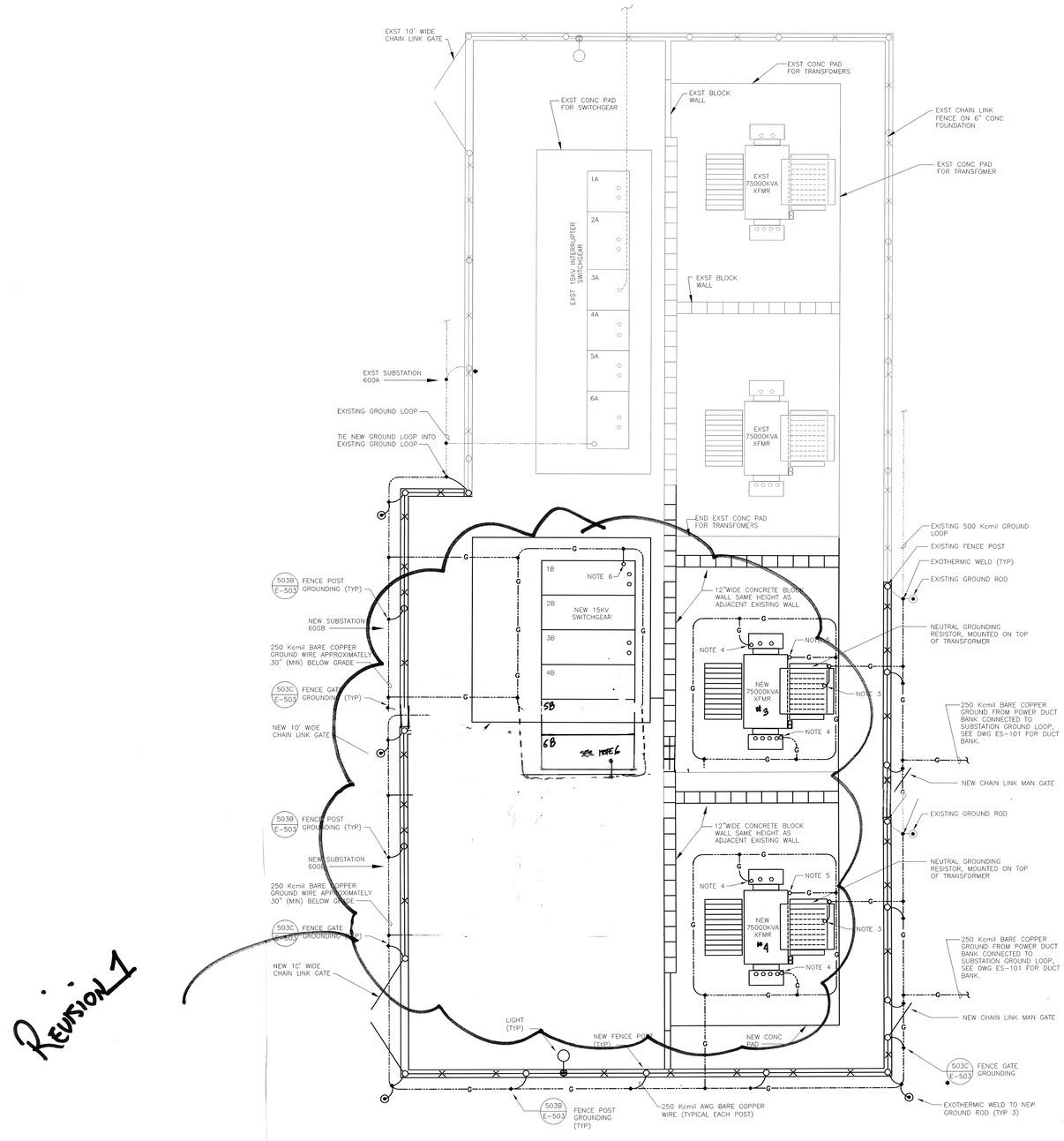
02-19-2009	TITLE II CONSTRUCTION BID ISSUE	G



403A ENLARGED PLAN SITE GROUNDING
ES-101 1/4" = 1'-0"

REVISION 1

NOTES

1. ALL GROUND WIRES TO SHALL BE 250 Kcmil BARE COPPER U.O.N.
2. NOT USED.
3. GROUND RESISTOR ELEMENT TO GROUND LOOP. RUN 250 Kcmil BARE COPPER GROUND WIRE FROM GROUND RESISTOR TO GROUND LOOP SIMILAR TO EXISTING TRANFORMER.
4. BOLTED CONNECTION TO GROUND BAR IN AIR TERMINAL BOX.
5. GROUND TRANSFORMER RAIL.
6. 250 Kcmil BARE COPPER GROUND WIRE TO SWITCHGEAR GROUND BUS FROM GROUND LOOP.

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JOB NO	SHEET NO	REVISION	DATE	DWN.	APP'D.	QA
		1	11/19/09			

BROOKHAVEN NATIONAL LABORATORY
UNDER CONTRACT WITH
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PLANT ENGINEERING DIVISION
UPTON, NEW YORK 11973

JOB TITLE: CENTRAL CHILLED WATER FACILITY PHASE II		DWG. TITLE: ENLARGED PLAN SITE GROUNDING	
E:\EGPP\JAN, HEM	DATE	ACCT. NO.	SHEET OF
SCALE: AS NOTED	DWN. BY: EA / REV'D BY: RB	JOB NO.: 11705	DWG. NO.: ES-403
CSHQ RISK LEVEL	APP'D. BY: R BARTOY	BLDG. NO.: 600	
PATH:			