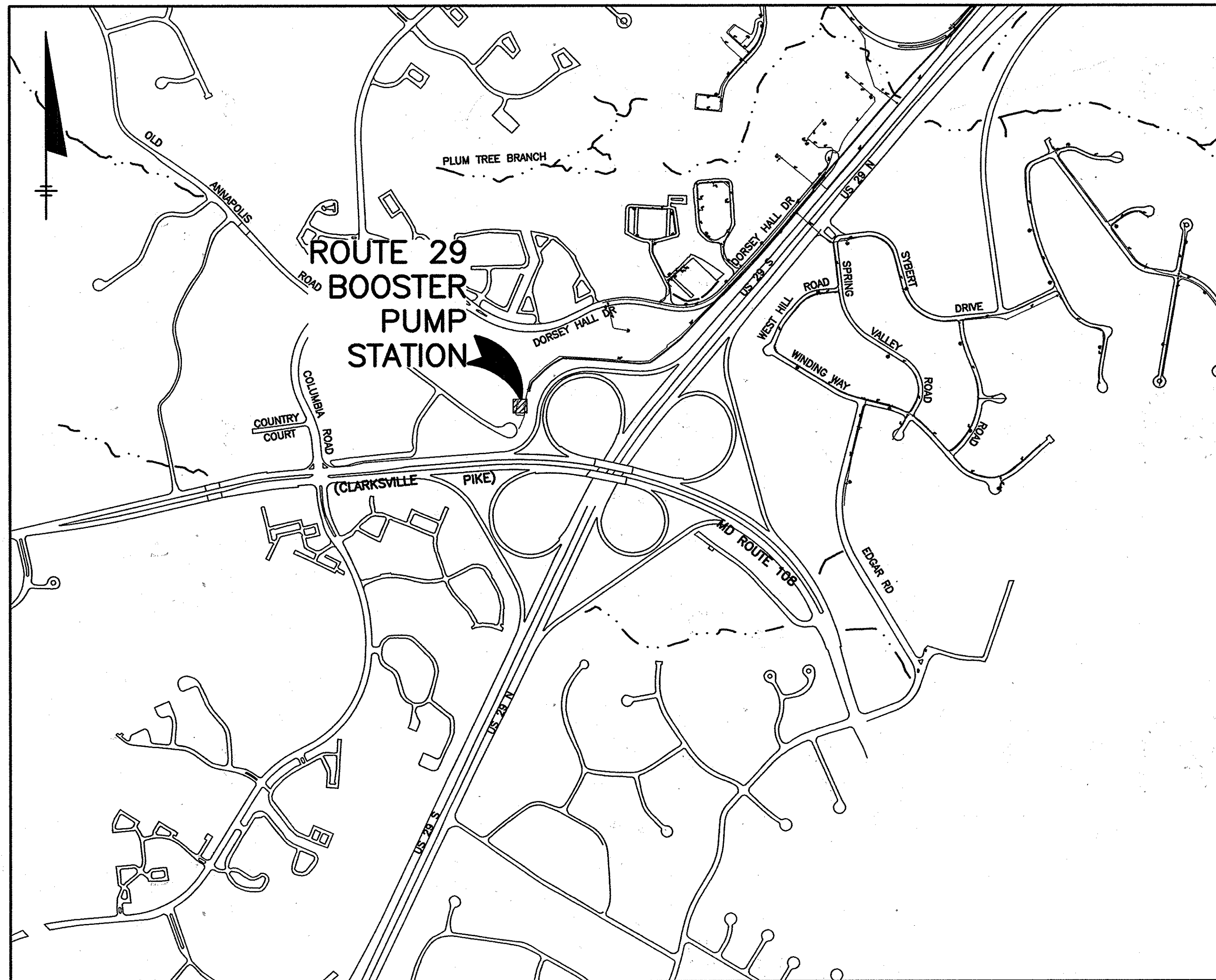


I:\HOWARD-CO.2343\448956.RT-29-BOOSTER-F-DOCS\DWG\SHEETS\448956-GOOD.DWG

**GENERAL NOTES:**

- ALL EXISTING EQUIPMENT AND APPURTENANCES SHOWN INSIDE THE PUMP STATION ARE BASED ON EXISTING RECORD DRAWINGS. THE CONTRACTOR SHALL FIELD VERIFY PRIOR TO COMMENCING WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- APPROXIMATE LOCATION OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:  
 AT&T.....1-800-252-1133  
 BGE (CONTRACTOR SERVICES).....410-850-4620  
 BGE (UNDERGROUND DAMAGE CONTROL).....410-787-9068  
 BGE (EMERGENCY).....410-685-1400  
 BUREAU OF UTILITIES.....410-313-4900  
 COLONIAL PIPELINE CO.....410-795-1390  
 MISS UTILITY.....1-800-257-7777  
 STATE HIGHWAY ADMINISTRATION.....410-531-5533  
 VERIZON.....1-800-743-0033/410-224-9210  
 MCI WORLD.COM.....1-800-624-9675
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. ANY TREES, OUTSIDE OF EXISTING EASEMENTS, DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND (3" CALIPER MINIMUM). CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE COUNTY BEFORE REMOVING ANY EXISTING TREES OR SHRUBS.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- EQUIPMENT SHOWN TO BE SALVAGED SHALL BE REMOVED AND DELIVERED TO THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS BUREAU OF UTILITIES AS DIRECTED BY THE ENGINEER OR COUNTY.



WATER AND SEWER CODE FOR COUNTY USE ONLY:	
WATER CODE NO.	F04
NO. OF CONNECTIONS	X
SEWER CODE NO.	N/A
NO. OF CONNECTIONS	0
DRAINAGE AREA	PATAPSCO

**VICINITY MAP**  
SCALE: 1" = 600'

# ROUTE 29 BOOSTER PUMP STATION UPGRADE

## CAPITAL PROJECT: W-8200

## CONTRACT NO.: 44-4661

## HOWARD COUNTY, MARYLAND

## DEPARTMENT OF PUBLIC WORKS

INDEX OF DRAWINGS	
DRAWING NO.	TITLE
1	COVER SHEET, GENERAL NOTES & SITE PLAN
2	ABBREVIATIONS & SYMBOLS
3	SITE PLAN
4	PUMP STATION DEMOLITION PLAN
5	PUMP STATION NEW WORK PLAN
6	MCC ONE-LINE DIAGRAM
7	MOTOR CONTROL WIRING DIAGRAMS
8	SCHEDULES
9	ELECTRICAL DETAILS
10	ELECTRICAL MODIFICATIONS
11	MECHANICAL & STRUCTURAL DETAILS

**ABBREVIATIONS/SYMBOLS**

ALUM	ALUMINUM	MTG	MOUNTING
B.G.E	BALTIMORE GAS & ELECTRIC	N.C.	NORMALLY CLOSED
CL or CL	CENTERLINE	NO.	NUMBER
C.O	CLEANOUT	NPT	NATIONAL PIPE THREAD
CONC.	CONCRETE	NTS	NOT TO SCALE
CORP.	CORPORATION STOP	O.C.	ON CENTER
CV	CHECK VALVE	PSI	POUNDS PER SQUARE INCH
DET.	DETAIL	PRV	PRESSURE REDUCING VALVE
D.I.P. OR DIP	DUCTILE IRON PIPE	RED.	REDUCER
DN	DOWN	REINF.	REINFORCEMENT
DWG	DRAWING	SRV	SURGE RELIEF VALVE
ECC.	ECCENTRIC	SST, SS	STAINLESS STEEL
EQ.	EQUAL	STD.	STANDARD
EQUIP.	EQUIPMENT	T/	TOP OF
EL.	ELEVATION	TS&V	TAPPING SLEEVE AND VALVE
EXIST., EX.	EXISTING	TYP.	TYPICAL
EXP.	EXPANSION	V.B.	VERTICAL BEND
F.F.	FINISHED FLOOR	VFD	VARIABLE FREQUENCY DRIVE
FLG	FLANGE	W/	WITH
FT. OR "	FEET	Ø	DIAMETER
GV	GATE VALVE		
H.B.	HORIZONTAL BEND		
IN. OR "	INCH		
INV.	INVERT		
MANUF.	MANUFACTURER		
MECH.	MECHANICAL		
MIN.	MINIMUM		
MJ	MECHANICAL JOINT		

**CIVIL SYMBOLS**

	REMOVE/ABANDON	<b>SECTION</b>		REFERENCE SECTION INDICATOR
	REGRADE	NOT TO SCALE		
	LOD	SILT FENCE/LIMIT OF DISTURBANCE		SECTION AND OR DETAIL INDICATOR
	TREE LINE			
	54	CONTOUR AND SPOT ELEV.		
	OR	PIPING		GRADE
	OR	HIDDEN PIPING		PAVEMENT
	X	CHAIN LINK FENCE		CONCRETE
	●	POST/BOLLARD		NEW PAVEMENT
	T	UTILITY POLE		ASPHALT
	Ⓢ	SEWER MANHOLE		GRAVEL
	ⓓ	DRAIN MANHOLE		
	☼	TREE		
	↑	DIRECTION NORTH		
	---	OVERHEAD ELECTRICAL & TELEPHONE		

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS. THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *Narayan Venkatesan*

**DETAIL**  
NOT TO SCALE

**D-NO**  
SHT REFERENCE DETAIL INDICATOR

2012 © O'BRIEN & GERE, INC.

<b>DEPARTMENT OF PUBLIC WORKS</b> HOWARD COUNTY, MARYLAND <i>John J. ...</i> 9/12/12 DIRECTOR OF PUBLIC WORKS DATE <i>William C. ...</i> 9/12/12 CHIEF, BUREAU OF UTILITIES DATE		<b>O'BRIEN &amp; GERE ENGINEERS, INC.</b> 4201 Mitchellville Rd. Suite 500 Bowie, Maryland 20716 (301) 731-5622 FAX: (301) 805-5984	
PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 12222 CORPORATION DATE 12/17/12		CHIEF, UTILITY DESIGN DIVISION <i>...</i> 9/12/12 DATE	

DSN. BY: NV					
DRN. BY: JFM					
CHK. BY: RJD					
DATE: SEPT. 2012	RJD	0	BID READY	09/12	
	BY	NO.	REVISION	DATE	

<b>GENERAL</b>	
<b>COVER SHEET</b>	
<b>GENERAL NOTES AND SITE PLAN</b>	
600' SCALE MAP NO. 30	BLOCK NO. 10

<b>ROUTE 29 BOOSTER PUMP STATION UPGRADE</b>	
CAPITAL PROJECT: W-8200	
CONTRACT NO.: 44-4661	
ELECTION DISTRICT NO. 2	
HOWARD COUNTY, MARYLAND	

SCALE AS SHOWN
SHEET
1 OF 11

ELECTRICAL DIAGRAMS			
SYMBOL	DESCRIPTIONS	SYMBOL	DESCRIPTIONS
	AUTOMATIC TRANSFER DEVICE, OPEN TRANSITION		N.O. MOMENTARY CONTACT PUSH BUTTON WITH NAMEPLATE AS INDICATED ON DIAGRAM
	AUTOMATIC TRANSFER DEVICE, CLOSED TRANSITION		N.C. MOMENTARY CONTACT PUSH BUTTON WITH NAMEPLATE AS INDICATED ON DIAGRAM
	METERING DEVICES: A-AMMETER, V-VOLTMETER, PF-POWER FACTOR, HZ-FREQUENCY METER		N.C. MAINTAINED CONTACT PUSH BUTTON WITH MUSHROOM BUTTON
	AMMETER SWITCH		TWO POSITION MAINTAINED CONTACT SELECTOR SWITCH WITH NAMEPLATE AS INDICATED ON DIAGRAMS
	VOLTMETER SWITCH		THREE POSITION MAINTAINED CONTACT SELECTOR SWITCH WITH NAMEPLATE AS INDICATED ON THE CONTROL DIAGRAMS. X = CLOSED 0 = OPEN
	DIGITAL METER		N.C. PRESSURE SWITCH - OPENS ON RISING PRESSURE
	FUSE, SIZE AS INDICATED		N.O. PRESSURE SWITCH - CLOSSES ON RISING PRESSURE
	GROUND CONNECTION		N.C. TEMPERATURE SWITCH - OPENS ON RISING TEMPERATURE
	TRANSFORMER (DELTA - RESISTANCE GROUNDED WYE SHOWN)		N.O. TEMPERATURE SWITCH - CLOSSES ON RISING TEMPERATURE
	CURRENT TRANSFORMER		N.C. FLOW SWITCH - OPENS ON RISING FLOW
	POTENTIAL TRANSFORMER		N.O. FLOW SWITCH - CLOSSES ON RISING FLOW
	LIGHTNING ARRESTOR		N.C. TORQUE SWITCH - OPENS ON INCREASING TORQUE
	CAPACITOR		N.O. TORQUE SWITCH - CLOSSES ON INCREASING TORQUE
	MOTOR STARTER CONTACTOR AND OVERLOAD RELAY, FVNR UON		N.C. LIMIT SWITCH (HELD OPEN)
	DISCONNECT SWITCH U.O.N.		N.C. LIMIT SWITCH
	KIRK KEY INTERLOCK		N.O. LIMIT SWITCH
	ELECTRICAL INTERLOCK		N.O. LIMIT SWITCH (HELD CLOSED)
	CIRCUIT BREAKER WITH RATINGS AS INDICATED		SOLENOID VALVE OR RELAY COIL
	PLUG & SOCKET		RELAY OR CONTACTOR COIL WITH TAG NUMBER AS SHOWN
	DRAW OUT DEVICE		N.O. RELAY CONTACT
	DRAW OUT POWER CIRCUIT BREAKER		N.C. RELAY CONTACT
	TEST TERMINAL BLOCK		ON-DELAY OR OFF-DELAY RELAY
	WIRING TERMINAL BLOCK		ON-DELAY RELAY N.C. TIMED OPENING CONTACT
	VARIABLE FREQUENCY CONTROLLER		ON-DELAY RELAY N.O. TIMED CLOSING CONTACT
	MOTOR - SINGLE WINDING UNLESS OTHERWISE NOTED: 2S2W = 2 SPEED 2 WINDING 2S1W = 2 SPEED 1 WINDING NUMERALS (IF SHOWN) INDICATE HP		OFF-DELAY N.C. CONTACT (OPENS WHEN ENERGIZED, TIMED CLOSING AFTER DE-ENERGIZING)
	CONDUCTORS NOT CONNECTED		OFF-DELAY N.O. CONTACT (CLOSSES WHEN ENERGIZED, TIMED OPENING AFTER DE-ENERGIZING)
	CONDUCTORS CONNECTED		MOTOR
	N.O. NORMALLY OPEN		INDICATOR OR PILOT LIGHT: R-RED, B-BLUE, W-WHITE, G-GREEN, A-AMBER O-ORANGE, C-CLEAR, NE-NEON, OP-OPALESCENT, P-PURPLE
	N.C. NORMALLY CLOSED		LATCHING RELAY L = LATCH COIL U = UNLATCH COIL
	LIMITS OF ELECTRICAL ENCLOSURE		FIELD WIRING TERMINAL
	ANSI DEVICE NO. 27 UNDERVOLTAGE RELAY		FIELD WIRING
	PHASE-BALANCE CURRENT RELAY WITH HARMONIC FILTER		ANTI-CONDENSATION HEATER
			ELAPSED TIME METER

ELECTRICAL PLANS & SECTIONS			
SYMBOL	DESCRIPTIONS	SYMBOL	DESCRIPTIONS
	SIMPLEX RECEPTACLE		ENCLOSED CIRCUIT BREAKER
	DUPLEX RECEPTACLE. (15 AMP UNLESS OTHERWISE NOTED)		NON-FUSED DISCONNECT SWITCH
	DUPLEX RECEPTACLE WITH WATERPROOF COVER		FUSED DISCONNECT SWITCH - FUSE SIZE AS INDICATED (40A)
	GROUND FAULT INTERRUPTER TYPE RECEPTACLE		480V RECEPTACLE WITH AUX CONTACTS
	DOUBLE DUPLEX RECEPTACLE, WITH SINGLE PLATE		COMBINATION MAGNETIC MOTOR STARTER. ABBREVIATION INDICATES TYPE: FVNR, FVR, RVAT, 2S1W, 2S2W, SST
	DUPLEX RECEPTACLE FLOOR MOUNTED		MOTOR
	SPECIAL RECEPTACLE: 20A, 2P, 3W, 208V NEMA 6-20R		GENERATOR
	SPECIAL RECEPTACLE: 30A, 2P, 3W, 208V NEMA 6-30R		MANUAL MOTOR STARTER WITH THERMAL OVERLOADS
	SPECIAL RECEPTACLE: 20A, 3P, 4W, 208/120V NEMA 14-20		CONTROL PANEL - TYPE AS INDICATED
	SPECIAL RECEPTACLE: 30A, 3P, 4W, 208V NEMA 15-30		CONTROL STATION
	SPECIAL RECEPTACLE: 30A, 3P, 4W, 208V NEMA L23-30R		TWO-POSITION DRUM SWITCH
	SPECIAL RECEPTACLE: 50A, 2P, 3W, 208V NEMA 6-50P		MOMENTARY CONTACT START-STOP PUSH BUTTON STATION
	EMERGENCY POWER OFF SWITCH		MAINTAINED CONTACT START-STOP PUSH BUTTON STATION
	JUNCTION BOX		MAINTAINED CONTACT EMERGENCY STOP PUSH BUTTON STATION OR PULL CORD
	CLOCK HANGER OUTLET		SOLENOID VALVE
	SINGLE POLE TOGGLE SWITCH		TORQUE SWITCH
	SWITCH - SUPERScript INDICATES FIXTURES CONTROLLED		ROTATION SENSOR (ZERO-SPEED SWITCH)
	DOUBLE POLE TOGGLE SWITCH		PANELBOARD
	THREE-WAY TOGGLE SWITCH (SPDT)		TRANSFORMER
	4-WAY TOGGLE SWITCH		MOTORIZED VALVE ACTUATOR
	KEY OPERATED SWITCH		INSTRUMENT
	SWITCH WITH PILOT LIGHT		BUS DUCT OR CABLE TRAY UP OR TOWARDS
	MOMENTARY CONTACT SWITCH		BUS DUCT OR CABLE TRAY DOWN OR AWAY
	OCCUPANCY SENSOR		SURFACE METAL RACEWAY WITH DEVICES AS INDICATED
	FIRE ALARM BELL		BUS DUCT, TYPE & SIZE AS INDICATED
	FIRE ALARM FLASHING STROBE LIGHT - WALL MOUNTED		CONCRETE ENCASED DUCTBANK BELOW GRADE
	FIRE ALARM HORN		EX. CONCRETE ENCASED DUCTBANK BELOW GRADE
	HORN TYPE SPEAKER		FLEXIBLE CONDUIT
	COMBINATION FIRE ALARM HORN AND FLASHING STROBE LIGHT		RACEWAY "UP" OR "TOWARDS"
	FIRE SUPPRESSION CONTROL PANEL		RACEWAY "DOWN" OR "AWAY"
	FIRE ALARM ANNUNCIATOR PANEL		HEAT TRACE CABLE
	FIRE ALARM CONTROL PANEL		LIGHTING CIRCUIT. NO. OF TICK MARKS = NO. OF CONDUCTORS (NOT INCLUDING GROUND) LONG TICK MARK = NEUTRAL (SEE PANEL SCHEDULE FOR CONDUIT AND WIRE SIZES).
	CEILING SPEAKER		RACEWAY CONCEALED IN OR BELOW SLAB OR BELOW GRADE.
	FIRE ALARM PULL STATION		BRANCH CIRCUIT HOMERUN TO PANELBOARD. QUANTITY OF CIRCUITS INDICATED BY ARROWS (SEE SPECIFICATIONS FOR CIRCUIT REQUIREMENTS)
	HEAT DETECTOR		RACEWAY RUN EXPOSED. CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG GROUND IN 3/4" CONDUIT, UON.
	SMOKE DETECTOR (PHOTOELECTRIC)		EXISTING LINE TYPE
	SMOKE DETECTOR (IONIZATION)		NEW ELECTRICAL WORK LINE TYPE
	ADDRESSABLE RELAY - CONTROL		DEMOLITION LINE TYPE ON DEMOLITION DRAWINGS
	SYSTEM ADDRESSABLE RELAY - MONITOR		FUTURE ELECTRICAL WORK LINE TYPE
	FLOW SWITCH		
	TAMPER SWITCH		
	PRESSURE SWITCH		
	PROJECTED BEAM RECEIVER		
	PROJECTED BEAM TRANSMITTER		

ELECTRICAL ABBREVIATIONS	
SYMBOL	DESCRIPTIONS
	FLUORESCENT LIGHTING FIXTURE (TYPE B SHOWN)
	FLUORESCENT LIGHTING FIXTURE (EMERGENCY OR NIGHT LIGHT)
	CEILING MOUNTED LIGHTING FIXTURE (TYPE N SHOWN)
	WALL MOUNTED LIGHTING FIXTURE
	70W HID WALL PACK
	EMERGENCY BATTERY UNIT WITH NO. OF HEADS INDICATED
	EMERGENCY BATTERY UNIT (WITH REMOTE HEADS)
	REMOTE EMERGENCY LIGHT HEAD
	EXIT SIGN - CEILING OR PENDANT MOUNTED (SHADED PORTION INDICATES FACE)
	EXIT SIGN - WALL MOUNTED
	EXIT SIGN WITH DIRECTIONAL ARROWS
	POLE MOUNTED LIGHTING FIXTURE - SINGLE, DOUBLE HEAD
	TELEPHONE OUTLET
	TELEPHONE OUTLET, WALL MOUNTED
	TELEPHONE OUTLET, FLOOR MOUNTED
	TELEPHONE/DATA OUTLET
	TELEPHONE/DATA OUTLET, FLOOR MOUNTED
	DATA OUTLET, FLOOR MOUNTED
	DATA OUTLET
	TELEPHONE POLE
	CARD READER
	DOOR LIMIT SWITCH
	DOOR RELEASE
	MAGNETIC LOCK
	GROUND ROD
	TRANSIENT VOLTAGE SURGE SUPPRESSOR
	DRAWING NOTE NUMBER 2
	COMPARTMENT NUMBER 2
	NEC ARTICLE 500 HAZARDOUS (CLASSIFIED) AREA DEFINITION

**GENERAL NOTES:**

- THIS IS A STANDARD SYMBOL LIST, SOME SYMBOLS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.
- REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
- PLAN & SECTION SYMBOLS MAY ALSO BE USED ON DIAGRAMS.
- ON ONE LINE DIAGRAMS FOR 3 PHASE SYSTEMS, DEVICE QUANTITY = 3 UNLESS OTHERWISE NOTED.
- WIRE SIZES SHOWN ARE AWG (AMERICAN WIRE GAUGE).

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS. THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *[Signature]*

ELECTRICAL ABBREVIATIONS	
SYMBOL	DESCRIPTIONS
A	AMPERE
AC	ALTERNATING CURRENT
AC	AMPS INTERRUPTING CAPACITY
AF	AMF FRAME
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
CEP	CONCRETE EQUIPMENT PAD
CKT	CIRCUIT
CMH	COMMUNICATION MANHOLE
COND	CONDUCTOR
CU	COPPER
CWA	CONSTANT WATTAGE AUTOTRANSFORMER
DC	DIRECT CURRENT
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
DPST	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW
DS	DISCONNECT SWITCH
DT	DOUBLE THROW
E	EMERGENCY
EC	EMPTY CONDUIT
EMT	ELECTRICAL METALLIC TUBING
ETM	ELAPSED TIME METER
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
FLA	FULL LOAD AMPERES
FMC	FLEXIBLE METAL CONDUIT
FS	FLOW SWITCH
FU	FUSED OR FUSIBLE
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
G	GROUND
GFR	GROUND FAULT INTERRUPTER
GRS	GROUND FAULT RELAY
HH	GALVANIZED RIGID STEEL CONDUIT
HPS	HANDHOLE
HV	HIGH PRESSURE SODIUM
HZ	HIGH VOLTAGE
IC	HERTZ
IG	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
I/I	CURRENT/CURRENT TRANSDUCER
I/O	CURRENT/PNEUMATIC TRANSDUCER
I/O	INPUT/OUTPUT
IMC	INTERMEDIATE METAL CONDUIT
IT	INSTANTANEOUS TRIP or INTERCHANGEABLE TRIP
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KV	KILVOLTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATTS
KWH	KILOWATT HOUR
LA	LIGHTNING ARRESTOR
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
LOR	LOCAL-OFF-REMOTE
LP	LIGHT POLE
LS	LIMIT SWITCH
LTG	LIGHTING
mA	MILLIAMPS
MCB	MAIN CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MH	MANHOLE
MLO	MAIN LUGS ONLY
MV	MERCURY VAPOR
NC	NORMALLY CLOSED
NF	NON-FUSED
NFSS	NON-FUSED SAFETY SWITCH
NGR	NEUTRAL GROUNDING RESISTOR
NOP	NORMALLY OPEN
ODP	OPEN DRIP PROOF
OL	OVERLOAD
( )	NUMBER OF POLES
φ, PH	PHASE
P/I	PNEUMATIC/CURRENT TRANSDUCER
PB	PUSHBUTTON
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PHH	POWER HANDHOLE
PL	PILOT LIGHT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
RFI	RADIO FREQUENCY INTERFERENCE
RGSC	RIGID GALVANIZED STEEL CONDUIT
RLA	RUNNING LOAD AMPERES
RMC	RIGID METAL CONDUIT
RMS	ROOT MEAN SQUARE
RSC	RIGID STEEL CONDUIT
RVAT	REDUCED VOLTAGE AUTO TRANSFORMER
SC	SURGE CAPACITOR
SS	SAFETY SWITCH OR STAINLESS STEEL
SST	SOLID STATE (SOFT START)
ST	SINGLE THROW
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
T-STAT, T	THERMOSTAT
TEL or TELE	TELEPHONE
THH	TELECOM HANDHOLE
TR	TIMING RELAY
TRANS	TRANSFORMER
TS	TEMPERATURE SWITCH
TSP	TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIPLE
UTP	UNSHIELDED TWISTED PAIR
V	VOLTS
VA	VOLT - AMPERES
VFC	VARIABLE FREQUENCY CONTROLLER
VS	VIBRATION SWITCH
W	WATTS, WIRE
XFMR	TRANSFORMER
2S1W	2 SPEED SINGLE WINDING
2S2W	2 SPEED TWO WINDING

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 9/12/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 9/12/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 9/12/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE ENGINEERS, INC.**

4201 Mitchellville Rd.  
Suite 500  
Bowie, Maryland 20716  
(301) 731-5622  
FAX: (301) 805-5984

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 22412. EXPIRATION DATE: APR 9, 2015.

*[Signature]*  
DATE: SEPT. 2012

DSN. BY: JWK					
DRN. BY: JFM					
CHK. BY: JWK					
DATE: SEPT. 2012	R/D 0	BID READY	09/12		
	BY NO.	REVISION	DATE	600' SCALE MAP NO. 30	BLOCK NO. 10

**ELECTRICAL ABBREVIATIONS & SYMBOLS**

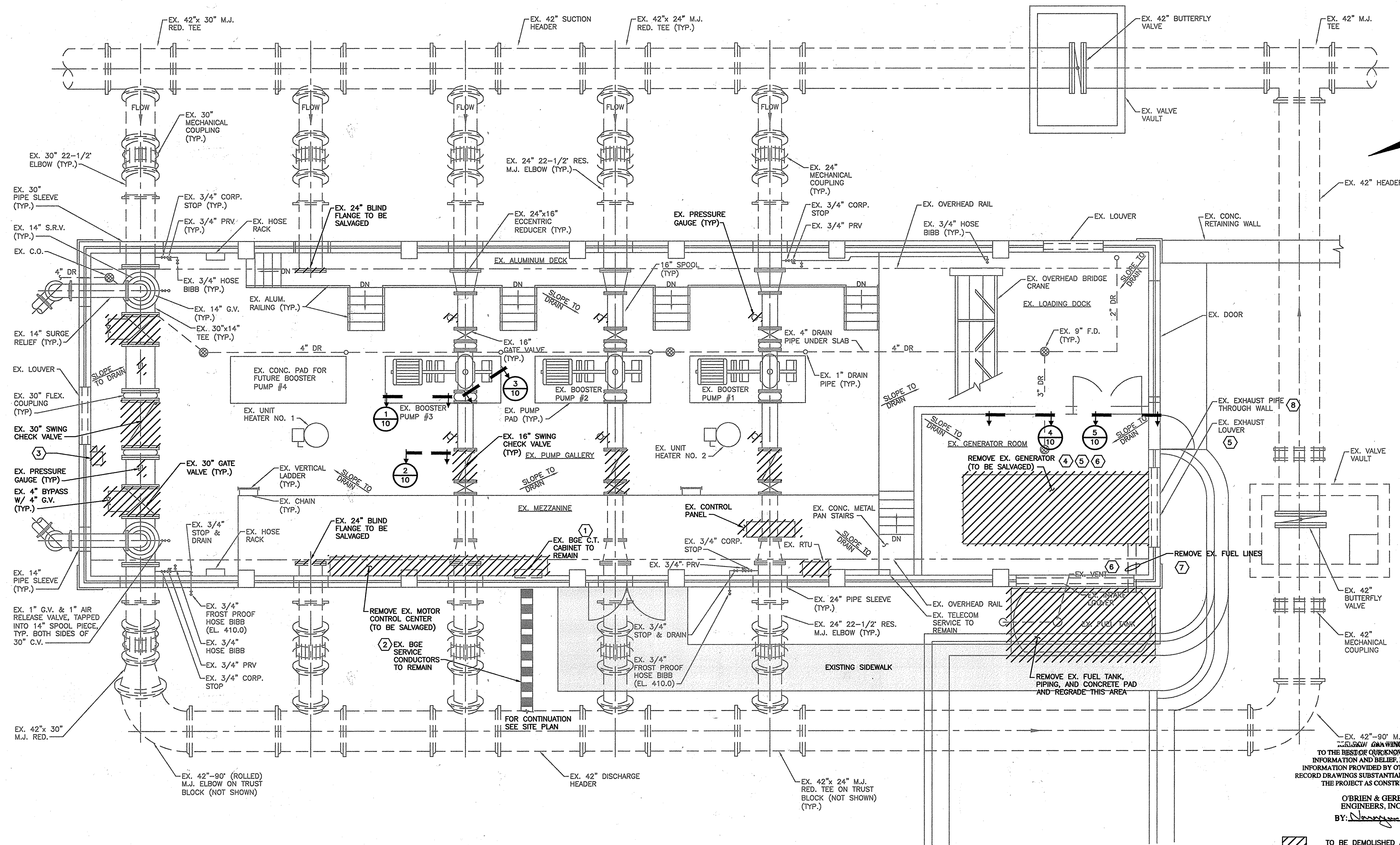
ROUTE 29  
BOOSTER PUMP STATION UPGRADE

CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO. 2  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2 OF 11





TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *Norman Ventresca*

TO BE DEMOLISHED AND REMOVED

4. CONTRACTOR SHALL REMOVE THE CONCRETE PAD UNDER THE EXISTING CONTROL PANEL. DEMOLISH INTO EXISTING MEZZANINE, CLEAN, APPLY BONDING AGENT AND APPLY 1" SELF-CONSOLIDATING 4000PSI CONCRETE.

1/4" = 1'-0"

**GENERAL NOTES:**

- FOR ADDITIONAL DEMOLITION REQUIREMENTS, REFER TO PROJECT SPECIFICATIONS.
- THE SECTIONS SHOWN ON THIS SHEET REFER TO DETAILS SHOWN ON SHEET 10.
- REMOVE PIPE SUPPORTS UNDER ALL EXISTING VALVES SHOWN TO BE DEMOLISHED.

**DRAWING NOTES:**

- RE-USE EX. BGE C.T. CABINET. SEE ONE-LINE DIAGRAMS.
- RE-USE EX. BGE SERVICE CONDUCTORS. SEE ONE-LINE DIAGRAMS.
- INSTALL NEW J.B. IN PLACE OF EXISTING EXHAUST FAN DISCONNECT SWITCH.
- REMOVE EX. GENERATOR SET, BATTERIES, BATTERY CHARGER, AND GENERATOR SET ACCESSORIES, NOT INCLUDING FUEL PIPING EXTERNAL TO ENGINE.
- REMOVE EX. DUCTWORK BETWEEN ENGINE RADIATOR AND LOUVER. BLANK OFF EX. LOUVER WITH 10 GAUGE GALVANIZED STEEL AND 2 INCHES OF FOAM INSULATION COVERED WITH 14 GAUGE GALVANIZED STEEL FASTENED TO WALL.
- REMOVE EX. DAMPER ACTUATORS AND BOLT DAMPER OPERATING MECHANISM IN CLOSED POSITION. INSULATE WITH 2 INCHES OF FOAM INSULATION COVERED 14 GAUGE GALVANIZED STEEL FASTENED TO WALL.
- SEE SPECIFICATION DIVISION 2 SECTION "DEMOLITION" FOR ADDITIONAL REQUIREMENTS.
- BREAK OUT ROUND HOLE AND PATCH HOLE WITH BRICK TO MATCH EXISTING.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jay K...* 9/12/12  
DIRECTOR OF PUBLIC WORKS DATE

*Mona E. Suttle* 9/6/12  
CHIEF, BUREAU OF ENGINEERING DATE

*Sue Clemon* 9/12/12  
CHIEF, BUREAU OF UTILITIES DATE

*...* 9/6/12  
CHIEF/UTILITY DESIGN DIVISION PSD DATE

O'BRIEN & GERE ENGINEERS, INC.

4201 Mitchellville Rd.  
Suite 500  
Bowie, Maryland 20716  
(301) 731-5622  
FAX: (301) 805-5984

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 18223. EXPIRATION DATE 12/12/13

DSN. BY: NV  
DRN. BY: JFM  
CHK. BY: RJD  
DATE: SEPT. 2012

RJD 0  
BY NO. BID READY 09/12  
REVISION DATE

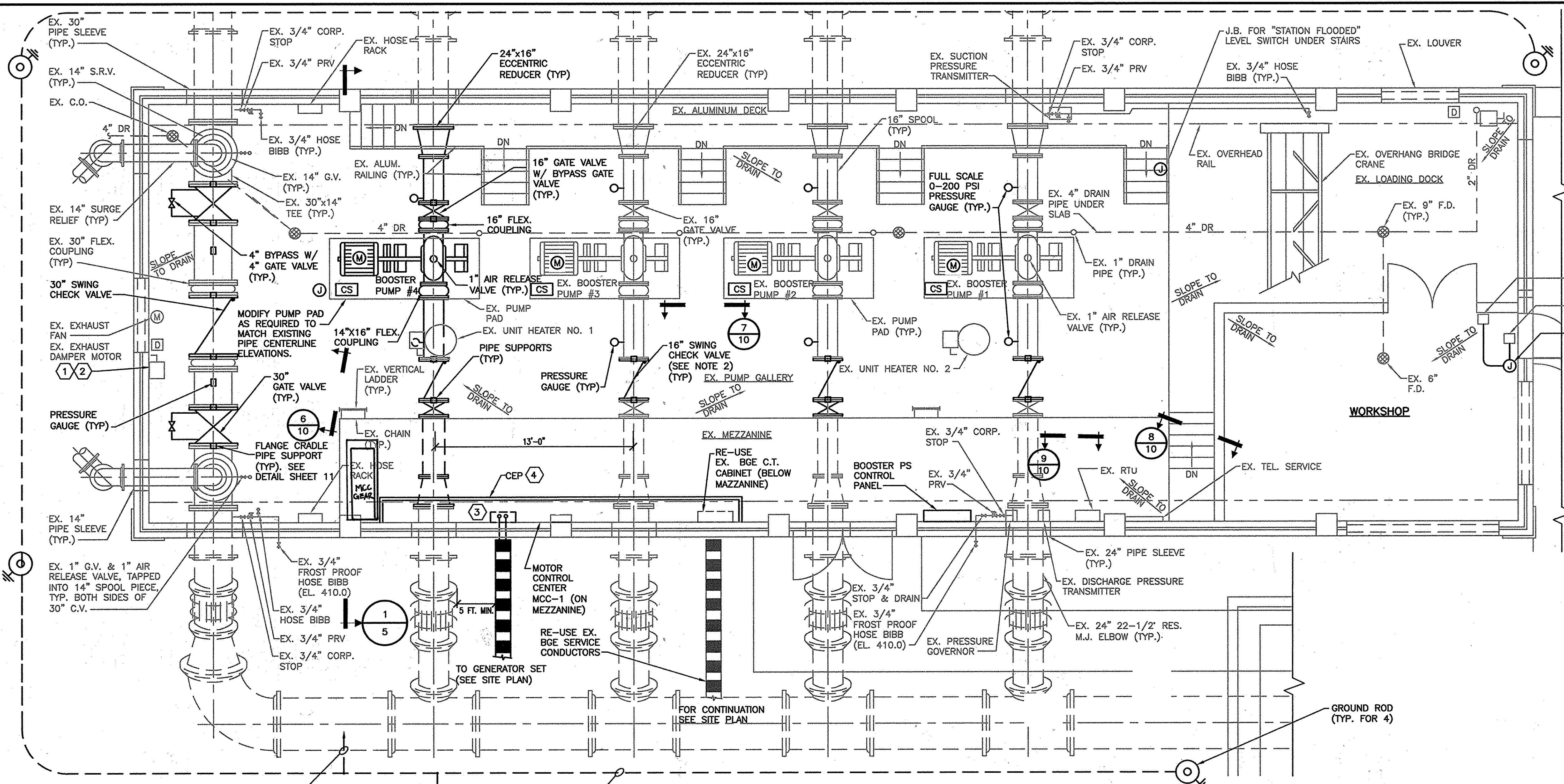
PUMP STATION DEMOLITION PLAN

600' SCALE MAP NO. 30 BLOCK NO. 10

ROUTE 29 BOOSTER PUMP STATION UPGRADE

CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO. 2  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 4 OF 11

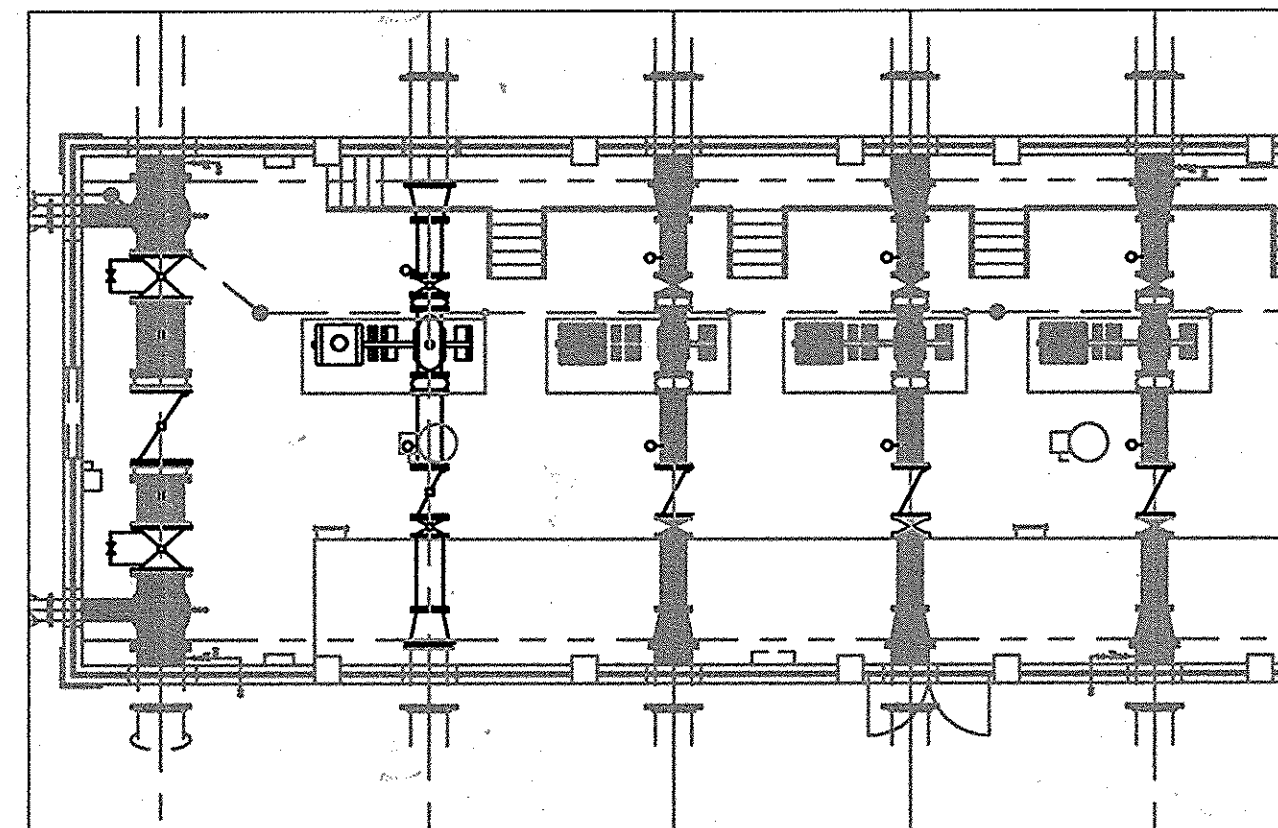
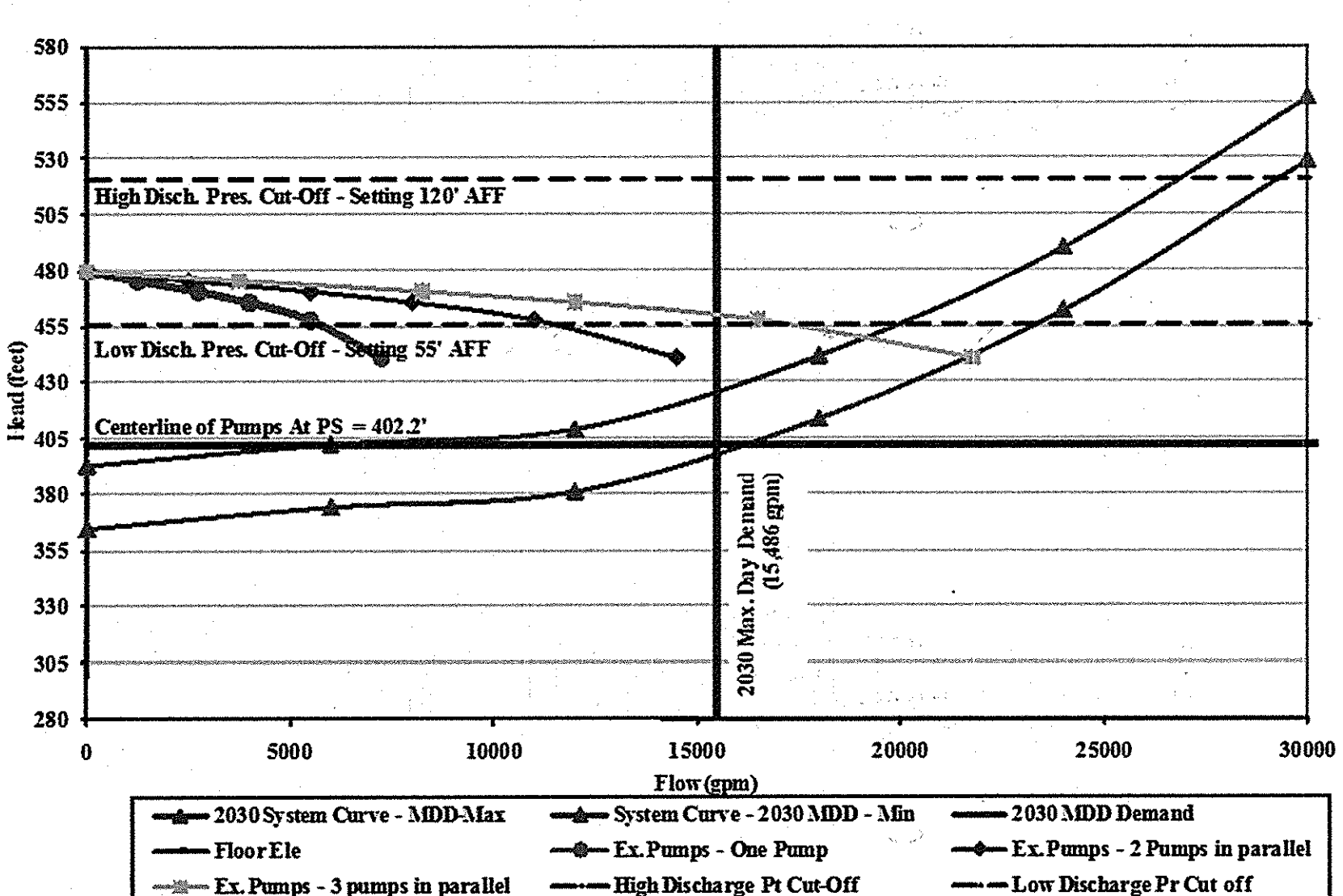


- LEGEND:**  
 — NEW WORK  
 — EXISTING CONDITIONS
- DRAWING NOTES:**
- MOUNT NEMA 4 DISCONNECT SWITCH FOR EXHAUST FAN 60" A.F.F. AND RUN WITH WIRE IN CONDUIT FROM NEW DISCONNECT SWITCH TO J.B. AT FAN (SEE DEMOLITION DWGS.)
  - INSTALL NEW J.B. IN PLACE OF EXISTING EXHAUST FAN DISCONNECT SWITCH.
  - CORE DRILL HOLES FOR DUCT BANK CONDUITS. SEE DETAIL ON SHEET 9.
  - EXTEND EX. CONCRETE EQUIPMENT PAD TO SUIT NEW MOTOR CONTROL CENTER.
- GENERAL NOTES:**
- NEW WORK IS SHOWN WITH A HEAVY LINE WEIGHT AND EXISTING WITH GRAY LINES ON THIS SHEET.
  - PROVIDE FILLER FLANGES AS NECESSARY TO INSTALL APPURTENANCES ON EXISTING PIPING.
  - REMOVE PAINT ON ALL EXISTING PIPING & APPURTENANCES AND REPAINT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. SEE THIS SHEET FOR LIMITS OF PAINTING.
  - CRACKS LOCATED ON EXISTING PUMP STATION WALLS, (ESTIMATED TOTAL OF 5), APPROXIMATELY 12" BELOW CEILING AND 12" LONG, SHALL BE FILLED WITH GROUT. CRACKS IN WALLS SHALL BE REPAIRED AS PER PROJECT SPECIFICATIONS.
  - CONTRACTOR SHALL REUSE/REPLACE THE EXISTING PIPE SPOOL BASED ON THE DIMENSIONS OF THE CHECK VALVE TO BE INSTALLED (TYP. FOR PUMPS #1, #2 AND #3).
  - EX. 5 TON BRIDGE CRANE MAY BE USED UNDER COUNTY SUPERVISION.
  - CORE DRILL HOLES IN MEZZANINE FLOOR UNDER MCC FOR CONDUITS AS NEEDED. MAINTAIN MIN. 8 IN. EDGE-TO-EDGE.

**PUMP STATION NEW WORK PLAN**

SCALE: 1/4" = 1'-0"

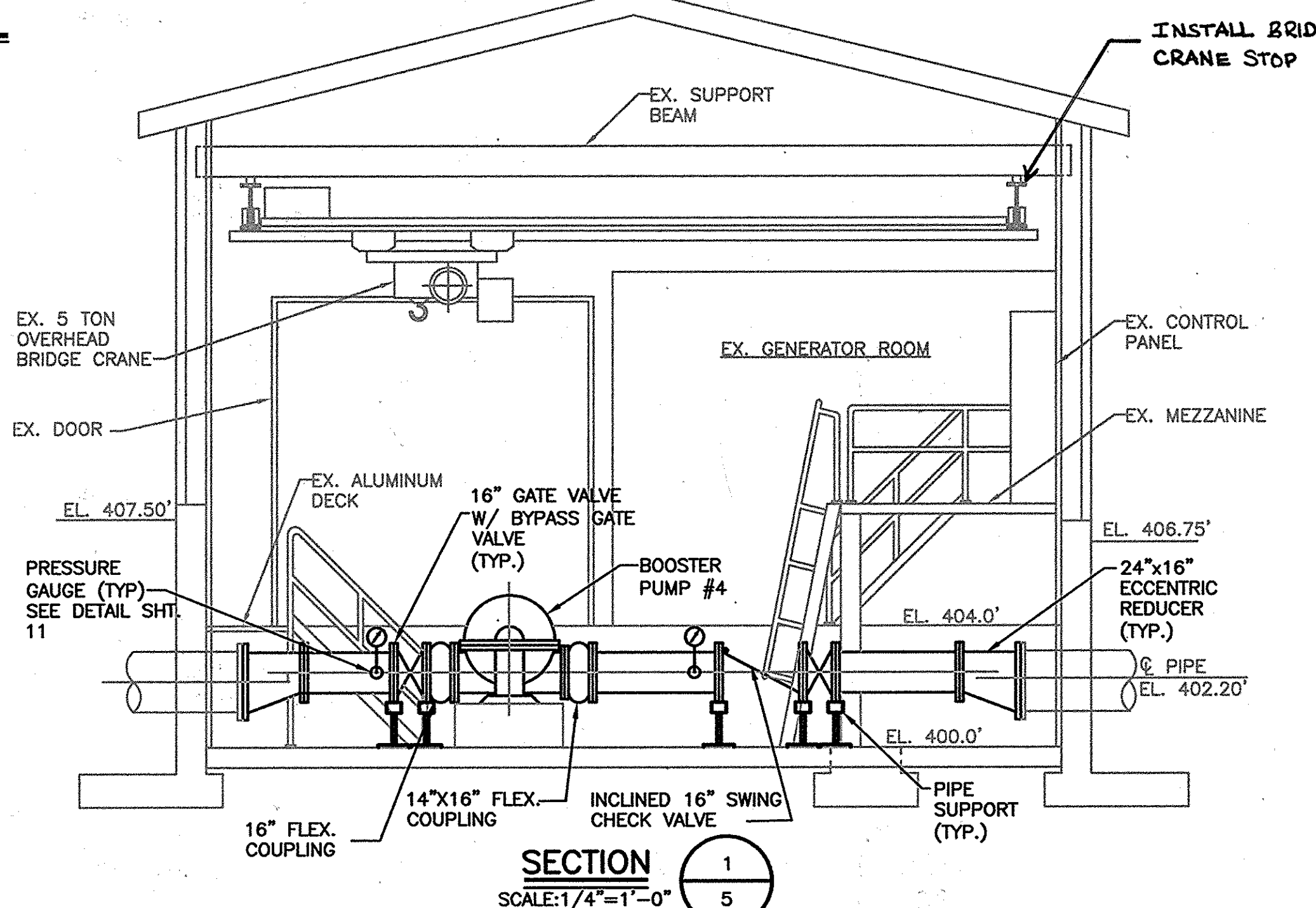
Howard County - Rt. 29 Booster Pump Station - System Curve



**LIMITS OF PIPE/EQUIPMENT REPAINTING**

NOT TO SCALE

- LEGEND:**  
 [Gray Box] PIPING/EQUIPMENT TO BE REPAINTED



**SECTION 1**

SCALE: 1/4" = 1'-0"

- INSTALL BRIDGE CRANE STOP**
- NEW WORK IS SHOWN WITH A HEAVY LINE WEIGHT AND EXISTING WITH GRAY LINES ON THIS SHEET.
  - PROVIDE FILLER FLANGES AS NECESSARY TO INSTALL APPURTENANCES ON EXISTING PIPING.
  - REMOVE PAINT ON ALL EXISTING PIPING & APPURTENANCES AND REPAINT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. SEE THIS SHEET FOR LIMITS OF PAINTING.
  - CRACKS LOCATED ON EXISTING PUMP STATION WALLS, (ESTIMATED TOTAL OF 5), APPROXIMATELY 12" BELOW CEILING AND 12" LONG, SHALL BE FILLED WITH GROUT. CRACKS IN WALLS SHALL BE REPAIRED AS PER PROJECT SPECIFICATIONS.
  - CONTRACTOR SHALL REUSE/REPLACE THE EXISTING PIPE SPOOL BASED ON THE DIMENSIONS OF THE CHECK VALVE TO BE INSTALLED (TYP. FOR PUMPS #1, #2 AND #3).
  - EX. 5 TON BRIDGE CRANE MAY BE USED UNDER COUNTY SUPERVISION.
  - CORE DRILL HOLES IN MEZZANINE FLOOR UNDER MCC FOR CONDUITS AS NEEDED. MAINTAIN MIN. 8 IN. EDGE-TO-EDGE.
- RECORD DRAWINGS**  
 TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.
- O'BRIEN & GERE ENGINEERS, INC.  
 BY: *[Signature]*

1/4" = 1'-0"

2012 © O'BRIEN & GERE, INC.

**DEPARTMENT OF PUBLIC WORKS**  
 HOWARD COUNTY, MARYLAND

*[Signature]* 9/6/12  
 DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 9/6/12  
 CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 9/6/12  
 CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE ENGINEERS, INC.**

4201 Mitchellville Rd.  
 Suite 500  
 Bowie, Maryland 20716  
 (301) 731-5622  
 FAX: (301) 805-5984

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 12222. EXPIRATION DATE: 12/31/13

*[Signature]*  
 DATE: 9/12/12

DSN. BY: NV					
DRN. BY: JFM					
CHK. BY: RJD					
DATE: SEPT. 2012	R/D 0	BID READY	09/12		
	BY NO.	REVISION	DATE	600' SCALE MAP NO. 30	BLOCK NO. 10

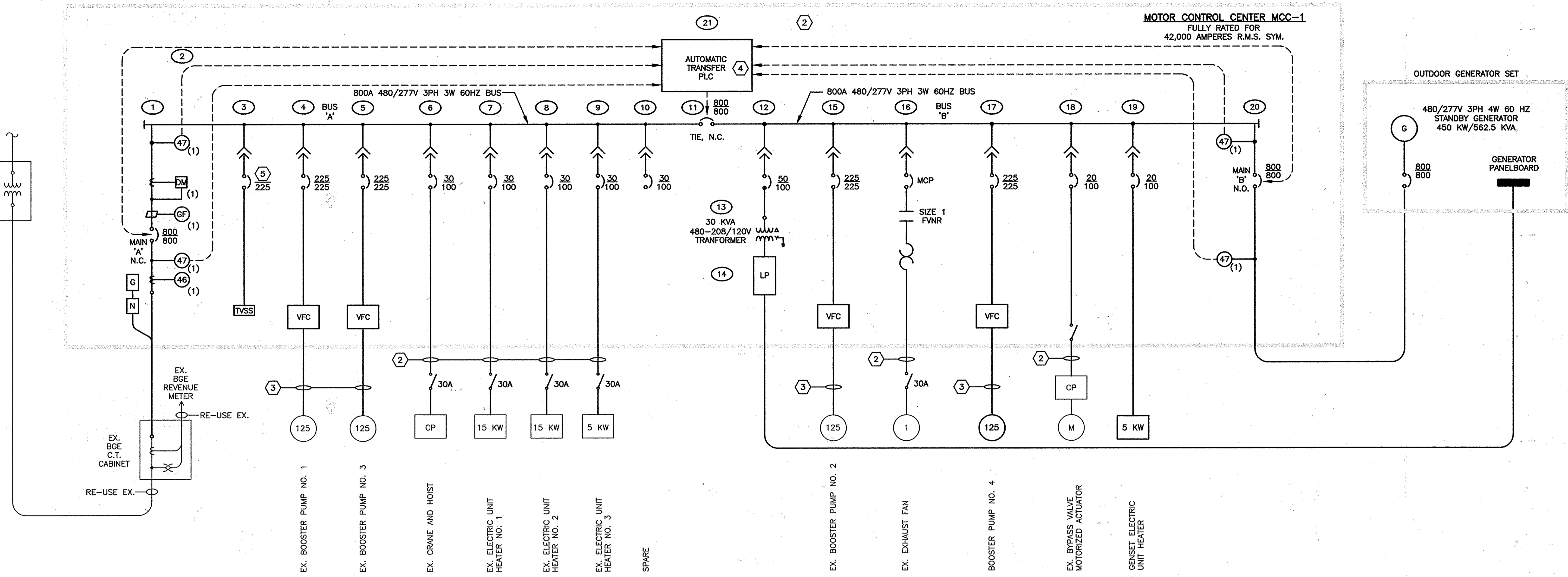
**GENERAL PUMP STATION NEW WORK PLAN**

**ROUTE 29 BOOSTER PUMP STATION UPGRADE**

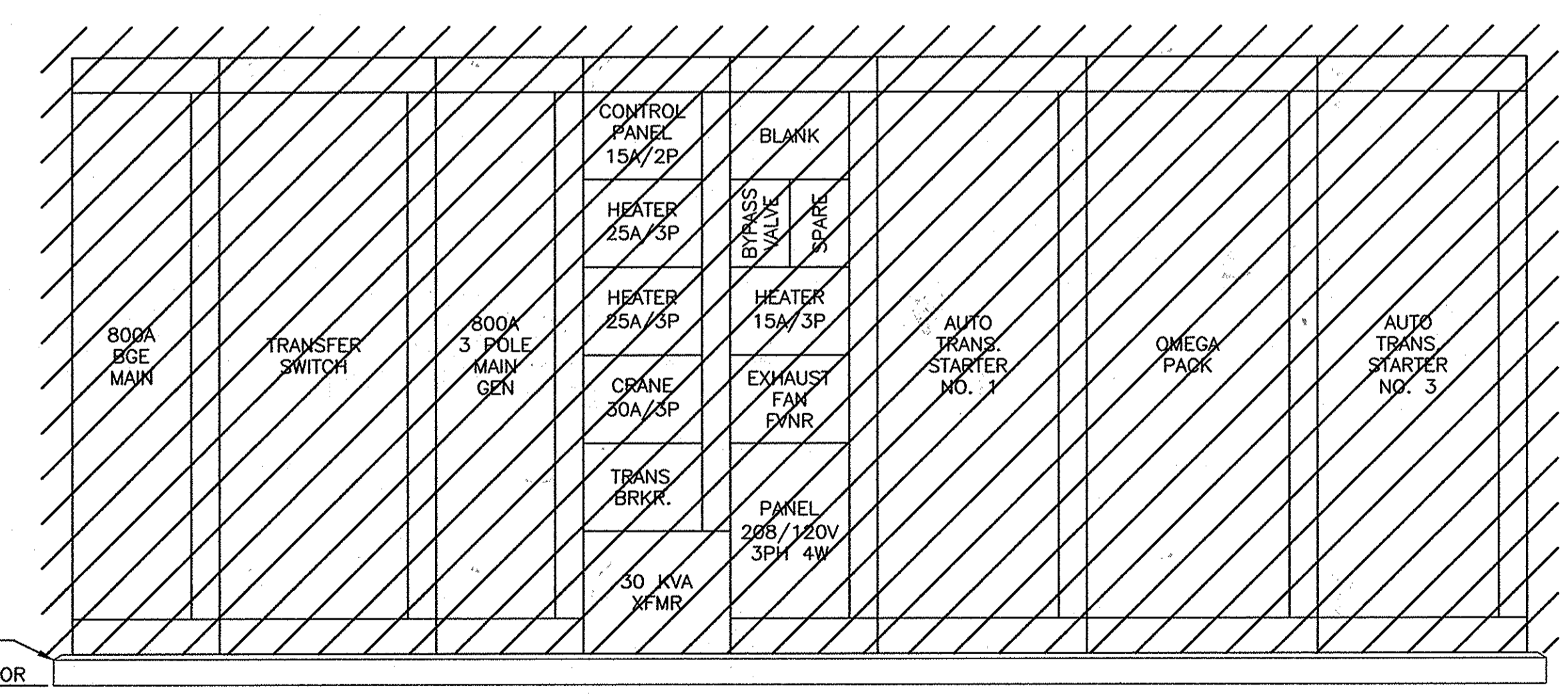
CAPITAL PROJECT: W-8200  
 CONTRACT NO.: 44-4661  
 ELECTION DISTRICT NO. 2  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 5 OF 11

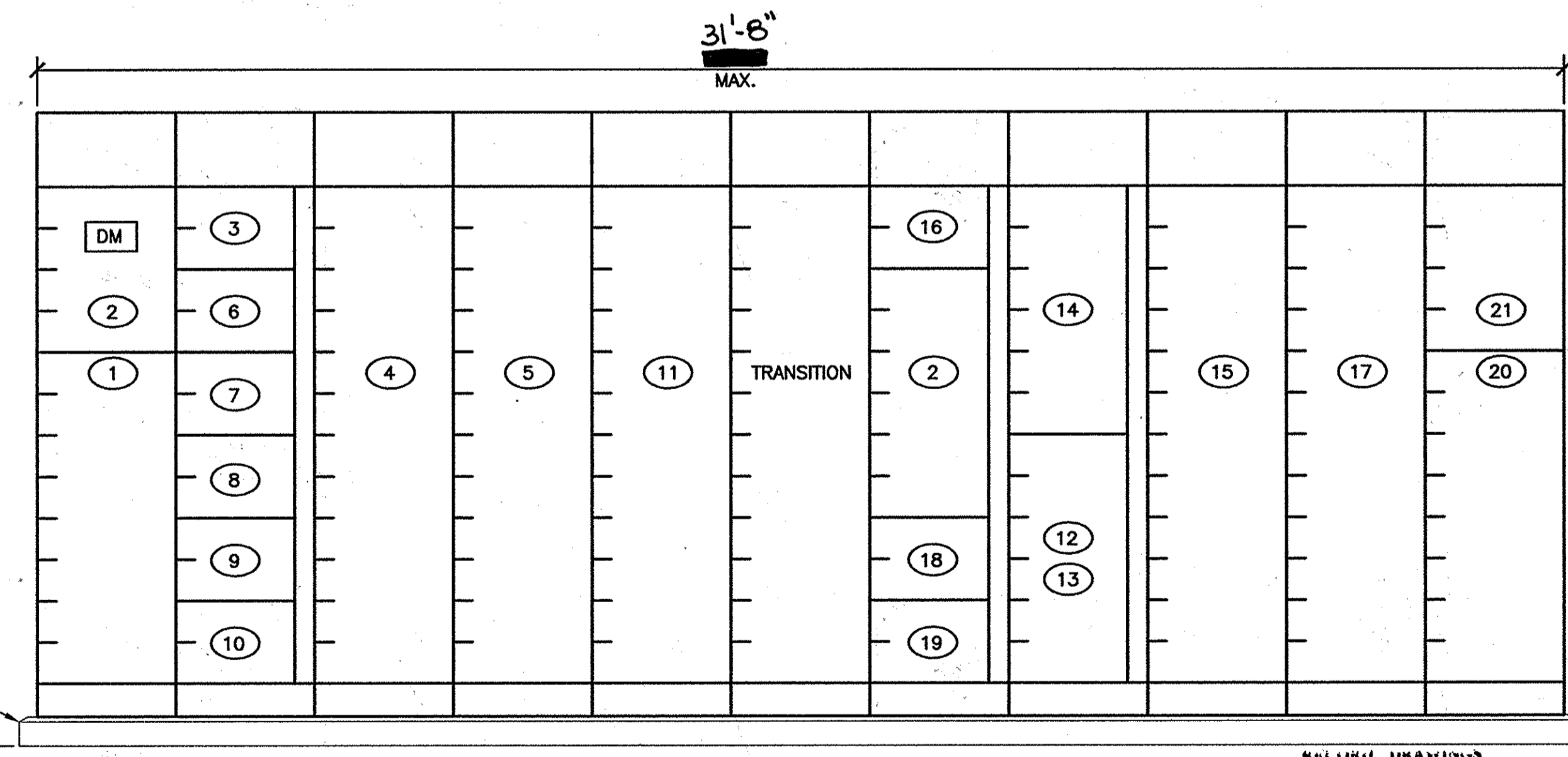
I:\HOWARD-CO.2343\44956.RT-29-BOOSTER-P\DOCS\DWG\SHEETS\44956-E002.DWG



**MCC-1 ONE-LINE DIAGRAM**  
NOT TO SCALE



**EX. MOTOR CONTROL CENTER**  
NOT TO SCALE



**MOTOR CONTROL CENTER MCC-1**  
NOT TO SCALE

- DRAWING NOTES:**
- ① DISCONNECT AND REMOVE EX. MCC.
  - ② RE-USE EX. CONDUITS TO EX. LOADS.
  - ③ RE-USE EX. UNDER-SLAB CONDUITS TO EX. BOOSTER PUMP MOTORS AND CONTROL STATIONS.
  - ④ PROVIDE THE FOLLOWING OUTPUTS TO THE BOOSTER P.S. CONTROL PANEL:  
- UTILITY POWER ON  
- UTILITY POWER FAILURE  
- GENERATOR CALLED TO RUN
  - ⑤ TRIP RATING BY TVSS MANUFACTURER.

- GENERAL NOTES:**
- 1. SEE 'NEW WORK PLAN' FOR EQUIPMENT LOCATIONS.
  - 2. PROVIDE WIRING FOR ALL MCC-MOUNTED COMPONENTS AS INDICATED AND SPECIFIED.
  - 3. EACH BOOSTER PUMP VFC SHALL BE FITTED WITH A SOFT-START BYPASS. SEE MOTOR CONTROL WIRING DIAGRAMS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *Davidson*

2012 © O'BRIEN & GERE, INC.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John G. ...* 9/12/12  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas E. ...* 9/16/12  
CHIEF, BUREAU OF ENGINEERING DATE

*William C. ...* 9/17/12  
CHIEF, BUREAU OF UTILITIES DATE

**O'BRIEN & GERE ENGINEERS, INC.**

4201 Mitchellville Rd.  
Suite 500  
Bowie, Maryland 20716  
(301) 731-5622  
FAX: (301) 805-5984

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 24814. EXPIRATION DATE: 12/31/12.

DSN. BY:	JWK				
DRN. BY:	JFM				
CHK. BY:	JWK				
DATE:	SEPT. 2012	JWK	0	BID READY	09/12
		BY	NO.	REVISION	DATE

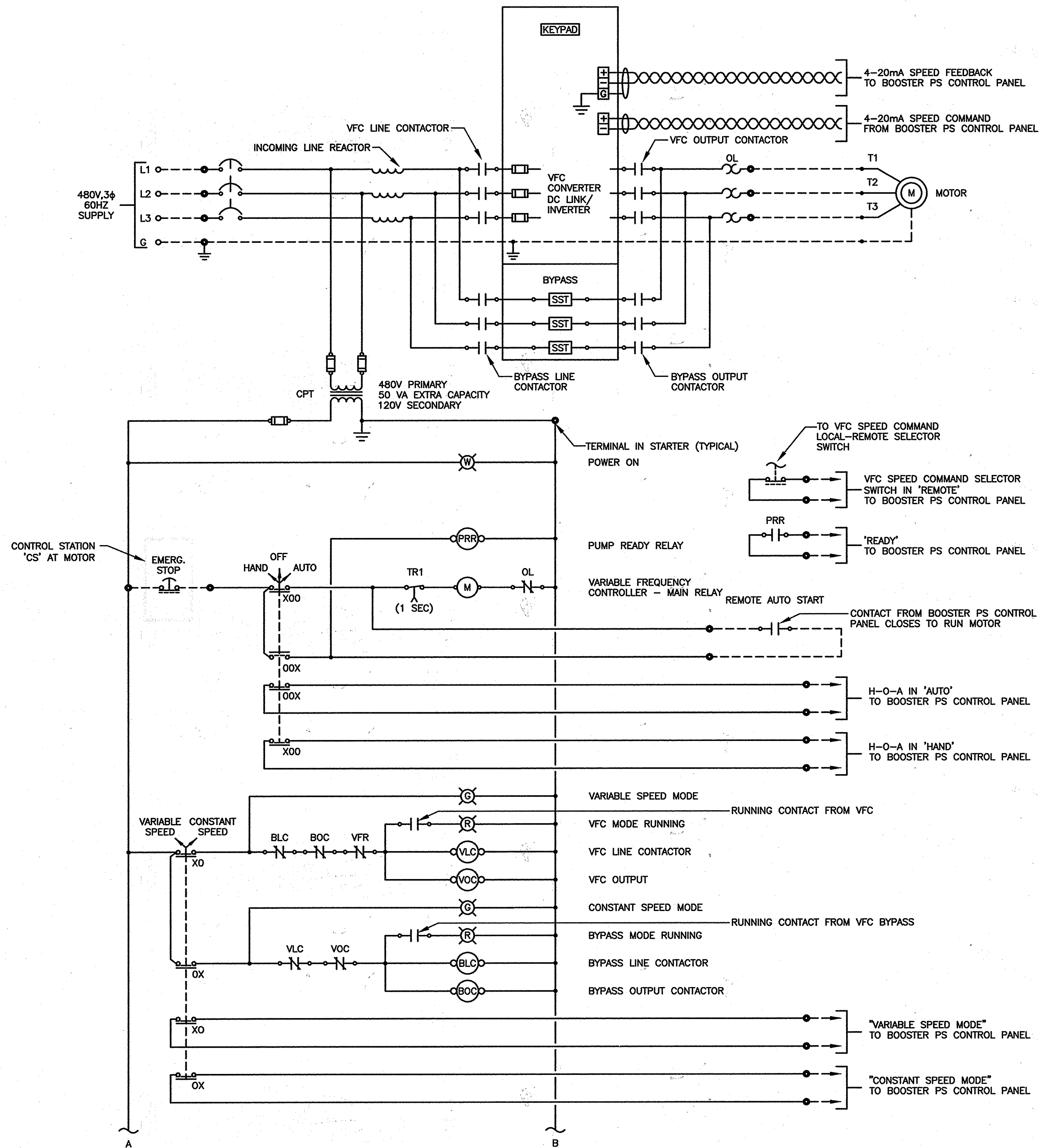
**MCC ONE-LINE DIAGRAM**

600' SCALE MAP NO. 30 BLOCK NO. 10

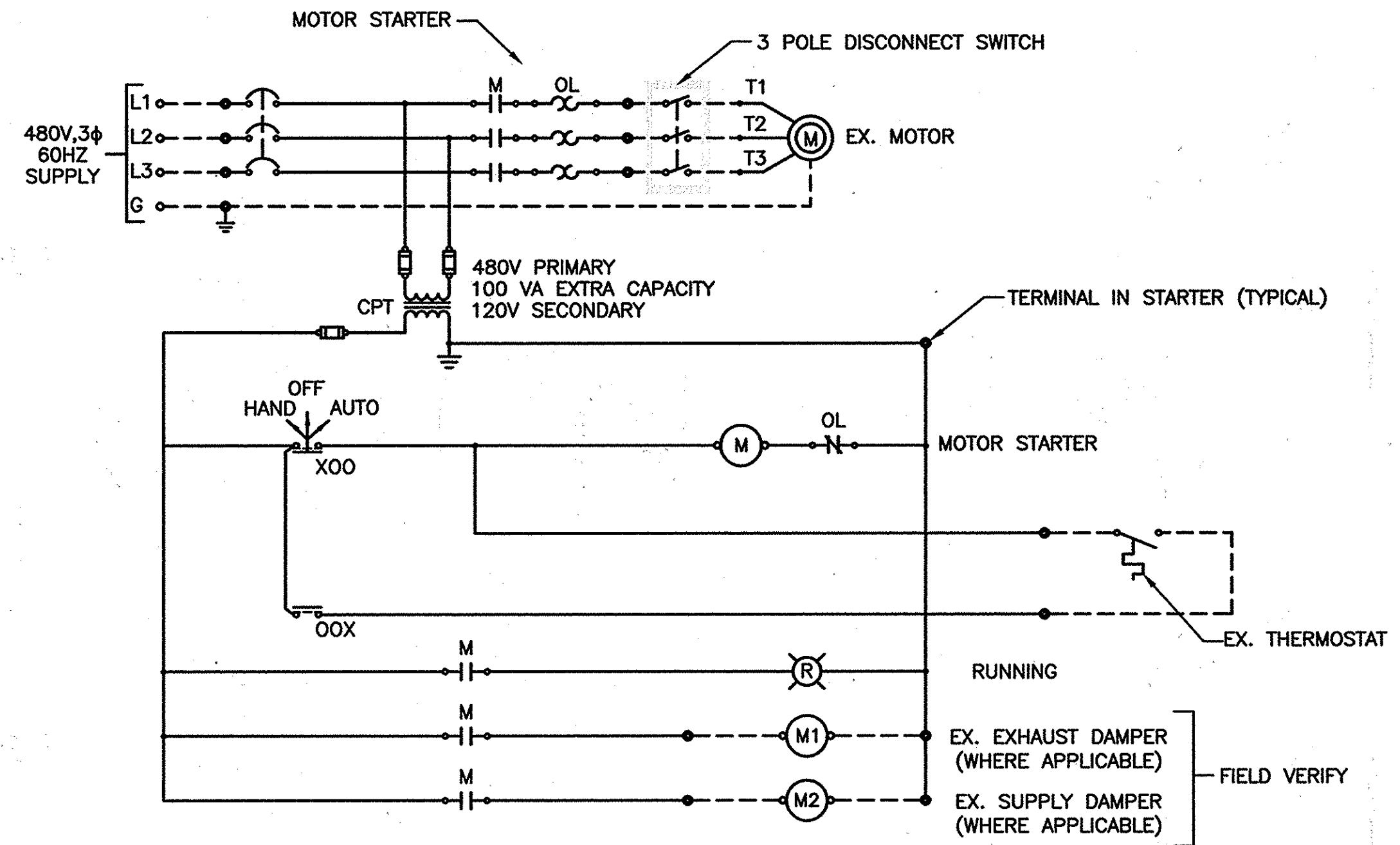
ROUTE 29  
BOOSTER PUMP STATION UPGRADE

CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO. 2  
HOWARD COUNTY, MARYLAND

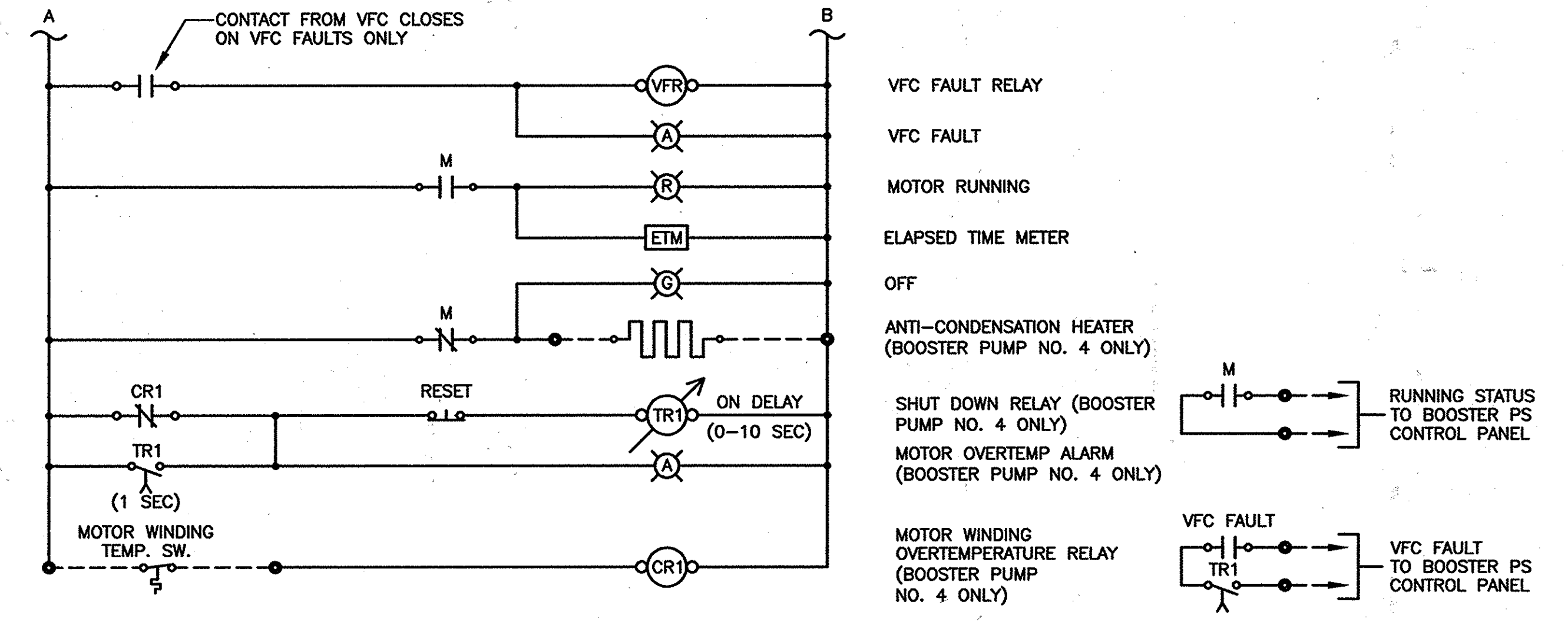
SCALE AS SHOWN  
SHEET 6 OF 11



**TYPICAL BOOSTER PUMP MOTOR CONTROL WIRING DIAGRAM**  
NOT TO SCALE



**TYPICAL EXHAUST FAN MOTOR CONTROL WIRING DIAGRAM**  
NOT TO SCALE



RECORD DRAWINGS  
TO THE BEST OF OUR KNOWLEDGE,  
INFORMATION AND BELIEF, BASED ON  
INFORMATION PROVIDED BY OTHERS, THESE  
RECORD DRAWINGS SUBSTANTIALLY REPRESENT  
THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE  
ENGINEERS, INC.  
BY: *[Signature]*

**GENERAL NOTES:**

- REFER TO SPECIFICATIONS FOR MOTOR CONTROLLER DETAILS.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* DATE *9/16/12*  
CHIEF, BUREAU OF UTILITIES

*[Signature]* DATE *9/16/12*  
CHIEF, UTILITY DESIGN DIVISION

**O'BRIEN & GERE ENGINEERS, INC.**  
4201 Mitchellville Rd., Suite 500  
Bowie, Maryland 20716  
FAX: (301) 805-5984

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 23412. EXPIRATION DATE: 12/31/12.

DSN. BY:	JWK			
DRN. BY:	JFM			
CHK. BY:	JWK			
DATE:	SEPT. 2012	JWK	0	BID READY 09/12
		BY	NO.	REVISION

**MOTOR CONTROL WIRING DIAGRAMS**

600' SCALE MAP NO. 30 BLOCK NO. 10

**ROUTE 29 BOOSTER PUMP STATION UPGRADE**  
CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO. 2  
HOWARD COUNTY, MARYLAND

CONDUIT & WIRE SCHEDULE									
CIRCUIT NO.	FROM:	TO:	CONDUIT QUANTITIES AND MIN. SIZES	QTY. OF PHASE AND NEUTRAL CONDUCTORS	EACH PHASE & NEUTRAL AWG	EQUIP. GROUND AWG	CONTROL WIRES QTY AWG	NOTES	
C101	MOTOR CONTROL CENTER MCC-1	BOOSTER PUMP NO. 4 J.B.	3/4"	---	---	---	8 #14	CONTROL STATION AT MOTOR, MOTOR ANTI-CONDENSATION HEATER, MWTS, 2 SPARE (RE-USE EX. UNDER-SLAB CONDUIT)	
C102	BOOSTER PUMP NO. 4 J.B.	BOOSTER PUMP NO. 4 CONTROL STATION	3/4"	---	---	---	4 #14	EMERGENCY STOP, 2 SPARE	
C103	BOOSTER PUMP NO. 4 J.B.	BOOSTER PUMP NO. 4 MOTOR	3/4"	---	---	---	4 #14	MOTOR ANTI-CONDENSATION HEATER, MWTS	
P104	MOTOR CONTROL CENTER MCC-1	BOOSTER PUMP NO. 4 MOTOR	2"	3	#30	#4	---	RE-USE EX. UNDER-SLAB CONDUIT	
P105	MOTOR CONTROL CENTER MCC-1	EX. BOOSTER PUMP NO. 1 MOTOR	2"	3	#30	#4	---	RE-USE EX. UNDER-SLAB CONDUIT	
C106	MOTOR CONTROL CENTER MCC-1	EX. BOOSTER PUMP NO. 1 MOTOR	3/4"	---	---	---	4 #14	CONTROL STATION AT MOTOR, 2 SPARE (RE-USE EX. UNDER-SLAB CONDUIT)	
P107	MOTOR CONTROL CENTER MCC-1	EX. BOOSTER PUMP NO. 2 MOTOR	2"	---	---	---	---	RE-USE EX. UNDER-SLAB CONDUIT	
C108	MOTOR CONTROL CENTER MCC-1	EX. BOOSTER PUMP NO. 2 MOTOR	3/4"	---	---	---	4 #14	CONTROL STATION AT MOTOR, 2 SPARE (RE-USE EX. UNDER-SLAB CONDUIT)	
P109	MOTOR CONTROL CENTER MCC-1	EX. BOOSTER PUMP NO. 3 MOTOR	2"	3	#30	#4	---	RE-USE EX. UNDER-SLAB CONDUIT	
C110	MOTOR CONTROL CENTER MCC-1	EX. BOOSTER PUMP NO. 3 MOTOR	3/4"	---	---	---	4 #14	CONTROL STATION AT MOTOR, 2 SPARE (RE-USE EX. UNDER-SLAB CONDUIT)	
P111	MOTOR CONTROL CENTER MCC-1	EX. BYPASS VALVE MOTORIZED ACTUATOR	3/4"	3	#12	#12	---	---	
P112	MOTOR CONTROL CENTER MCC-1	EX. CRAIN & HOIST	3/4"	3	#8	#10	---	---	
S113	BOOSTER PS CONTROL PANEL	EX. DISCHARGE PRESSURE TRANSMITTER	3/4"	---	---	---	2 TSP	DISCHARGE PRESSURE, SPARE	
P114	MOTOR CONTROL CENTER MCC-1	EX. ELECTRIC UNIT HEATER NO. 1	3/4"	3	#10	#10	---	---	
P115	MOTOR CONTROL CENTER MCC-1	EX. ELECTRIC UNIT HEATER NO. 2	3/4"	3	#10	#10	---	---	
P116	MOTOR CONTROL CENTER MCC-1	EX. ELECTRIC UNIT HEATER NO. 3	3/4"	3	#12	#12	---	---	
P117	MOTOR CONTROL CENTER MCC-1	EX. EXHAUST FAN	3/4"	3	#12	#12	6 #14	POWER VIA NEW DISC. SW., RECONNECT DAMPER CONTROLS	
S118	BOOSTER PS CONTROL PANEL	EX. FLOW TRANSMITTER	3/4"	---	---	---	2 TSP	FLOW, SPARE	
C119	BOOSTER PS CONTROL PANEL	EX. INTRUSION ALARM SWITCH AND AUTHORIZED ENTRY SWITCH J.B.	3/4"	---	---	---	8 #14	INTRUSION ALARM SWITCH, AUTHORIZED ENTRY SWITCH, 4 SPARES	
C120	BOOSTER PS CONTROL PANEL	EX. STATION FLOODED LEVEL SWITCH	3/4"	---	---	---	2 #14	HIGH LEVEL SWITCH	
S121	BOOSTER PS CONTROL PANEL	EX. SUCTION PRESSURE TRANSMITTER	3/4"	---	---	---	2 TSP	SUCTION PRESSURE, SPARE	
C122	MOTOR CONTROL CENTER MCC-1	GENERATOR CONTROL PANEL	1"	---	---	---	10 #14	GENERATOR START COMMAND, GENERATOR RUNNING, GENERATOR TROUBLE, GENERATOR FAILURE, 4 SPARES; VIA DUCT BANK	
P123	MOTOR CONTROL CENTER MCC-1	GENERATOR SET ELECTRIC UNIT HEATER	1"	3	#12	#12	---	VIA DUCT BANK	
P124	EX. BGE C.T. CABINET	MOTOR CONTROL CENTER MCC-1	2-3"	3+N	2-500 KCMIL	#10	---	---	
P125	GENERATOR SET	MOTOR CONTROL CENTER MCC-1	2-3"	3+N	2-500 KCMIL	#10	---	VIA DUCT BANK AND PULL BOX	
C126	BOOSTER PS CONTROL PANEL	MOTOR CONTROL CENTER MCC-1	3/4"	---	---	---	10 #14	GENERATOR RUNNING, GENERATOR TROUBLE, GENERATOR FAILURE, 4 SPARES	
C127	BOOSTER PS CONTROL PANEL	MOTOR CONTROL CENTER MCC-1	2"	---	---	---	86 #14	UTILITY POWER ON, UTILITY POWER FAILURE, GENERATOR CALLED TO RUN; BOOSTER PUMP NOS. 1-4 READY, RUN COMMAND, H-O-A IN HAND, H-O-A IN AUTO, VARIABLE SPEED MODE SELECTED, CONSTANT SPEED MODE SELECTED, VFC SPEED COMMAND SELECTOR SWITCH IN REMOTE, PUMP RUNNING, VFC FAULT, 8 SPARE	
C128	BOOSTER PS CONTROL PANEL	MOTOR CONTROL CENTER MCC-1	3/4"	---	---	---	4 #14	UTILITY POWER FAILURE, 2 SPARE	
S129	BOOSTER PS CONTROL PANEL	MOTOR CONTROL CENTER MCC-1	1-1/2"	---	---	---	8 TSP	BOOSTER PUMP NOS. 1-4 PUMP SPEED COMMAND AND ISOLATED SPEED FEEDBACK	
S130	BOOSTER PS CONTROL PANEL	EX. TELECOM SERVICE	3/4"	1	CAT 5	---	---	DATA HIGHWAY FROM RTU TO MTU	

<b>PANEL NO.:</b>		<b>EX. PANELBOARD 'A'</b>	
<b>USAGE:</b>		<b>LIGHTING PANELBOARD</b>	
<b>LOCATION:</b>		<b>INSIDE EX. MCC</b>	
<b>PHASE / FREQUENCY:</b>		<b>3 60 Hz</b>	
<b>L-L VOLTS</b>		<b>208</b>	
<b>L-N VOLTS</b>		<b>120</b>	
<b>BUS AMPS</b>		<b>225</b>	
<b>FAULT CURRENT RATING:</b>		<b>10,000</b>	
<b>MAIN CB AMPS</b>		<b>100</b>	

CONDUIT SIZE	PHASE & NEUTRAL SIZE	EGC SIZE	LOAD DESCRIPTION	C.B. TRIP / POLES	CIRCUIT NUMBER A B C	C.B. TRIP / POLES	LOAD DESCRIPTION	CONDUIT SIZE	PHASE & NEUTRAL SIZE	EGC SIZE
-	#12 AWG	#12 AWG	LIGHTS - N. END OVER PUMPS	20/1	1 A 2	20/1	LIGHTS - MIDDLE OVER PUMPS	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	LIGHTS - MEZZANINE & S. END	20/1	3 B 4	20/1	LIGHTS - GENERATOR ROOM	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	LIGHTS UNDER MEZZANINE	20/1	5 C 6	20/1	LIGHTS - OUTDOOR FLOOD	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	RECEPT. - EAST WALL	20/1	7 A 8	20/1	EMERGENCY LIGHTS	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	RECEPT. UNDER MEZZANINE	20/1	9 B 10	20/1	GARAGE DOOR	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	RECEPT. - GENERATOR ROOM	20/1	11 C 12	20/1	BATTERY CHARGER	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	GENERATOR CONTROLS	20/1	13 A 14	20/1	DAY TANK	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	WATER JACKET HEATER	20/1	15 B 16	20/1	WATER HEATER	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	FLOW METER VAULT	20/1	17 C 18	20/1	CONTROL EXHAUST FAN LOUVERS	EX.	#12 AWG	#12 AWG
-	#12 AWG	#12 AWG	SCADA & CONTROL PANEL LIGHT	20/1	19 A 20	20/1	NOT LABELED	EX.	#12 AWG	#12 AWG
-	#10 AWG	#10 AWG	NOT LABELED	30/2	21 B 22	15/1**	NOT LABELED	EX.	#12 AWG	#12 AWG
-	#10 AWG	-	NOT LABELED	30/2	23 C 24	20/1	SPARE	-	-	-
-	-	-	SPACE	-	25 A 26	-	SPACE	-	-	-
-	-	-	SPACE	-	27 B 28	-	SPACE	-	-	-
-	-	-	SPACE	-	29 C 30	-	SPACE	-	-	-

EX. PANEL 'A' IN MCC (TO BE DEMOLISHED)

NOT TO SCALE

<b>PANEL NO.:</b>		<b>PANELBOARD 'LP'</b>	
<b>USAGE:</b>		<b>LIGHTING PANEL WITH TVSS</b>	
<b>LOCATION:</b>		<b>INSIDE NEW MCC</b>	
<b>PHASE / FREQUENCY:</b>		<b>3 60 Hz</b>	
<b>L-L VOLTS</b>		<b>208</b>	
<b>L-N VOLTS</b>		<b>120</b>	
<b>BUS AMPS</b>		<b>225</b>	
<b>FAULT CURRENT RATING:</b>		<b>10,000</b>	
<b>MAIN CB AMPS</b>		<b>100</b>	

<b>MOUNTING:</b>		<b>SURFACE</b>	
<b>PANEL TYPE:</b>		<b>SEE SPECIFICATIONS</b>	
<b>PANEL NOTES:</b>			
EQUIPPED WITH GROUND BUS			
EQUIPPED WITH FULL SIZE NEUTRAL BUS			
*- INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE			
**- INDICATES C.B. IS GFCI TYPE 5 mA FOR RECEPTACLE CIRCUITS, 30 mA FOR HEAT TRACING CIRCUITS			

CONDUIT SIZE	PHASE & NEUTRAL SIZE	EGC SIZE	LOAD DESCRIPTION	C.B. TRIP / POLES	CIRCUIT NUMBER A B C	C.B. TRIP / POLES	LOAD DESCRIPTION	CONDUIT SIZE	PHASE & NEUTRAL SIZE	EGC SIZE
RE-USE EX	#12	#12	LIGHTS - N. END OVER PUMPS	20/1	1 A 2	20/1	LIGHTS - MIDDLE OVER PUMPS	RE-USE EX	#12	#12
RE-USE EX	#12	#12	LIGHTS - MEZZANINE & S. END	20/1	3 B 4	20/1	LIGHTS - GENERATOR ROOM	RE-USE EX	#12	#12
RE-USE EX	#12	#12	LIGHTS UNDER MEZZANINE	20/1	5 C 6	20/1	LIGHTS - OUTDOOR FLOOD	RE-USE EX	#12	#12
RE-USE EX	#12	#12	RECEPT. - EAST WALL	20/1	7 A 8	20/1	EMERGENCY LIGHTS	RE-USE EX	#12	#12
RE-USE EX	#12	#12	RECEPT. UNDER MEZZANINE	20/1	9 B 10	20/1	GARAGE DOOR	RE-USE EX	#12	#12
RE-USE EX	#12	#12	RECEPT. - GENERATOR ROOM	20/1	11 C 12	20/1	SPARE	-	-	-
3/4"	#12	#12	BOOSTER PS CONTROL PANEL	20/1	13 A 14	20/1	BOOSTER PS CONTROL PANEL	RE-USE EX	#12	#12
-	-	-	SPARE	20/1	15 B 16	20/1	WATER HEATER	RE-USE EX	#12	#12
RE-USE EX	#12	#12	FLOW METER VAULT	20/1	17 C 18	20/1	CONTROL EXHAUST FAN LOUVERS	RE-USE EX	#12	#12
-	-	-	SPARE	20/1	19 A 20	20/1	TRACE & LABEL	-	3/4"	#12
3/4"	#10	#10	TRACE & LABEL	30/2	21 B 22	15/1**	TRACE & LABEL	-	3/4"	#12
-	#10	-	TRACE & LABEL	-	23 C 24	20/1	SPARE	-	-	-
-	-	-	SPACE	20/1	25 A 26	100/50/3	SUBFEED TO	-	1"	#6
-	-	-	SPACE	20/1	27 B 28	-	OUTDOOR GENERATOR	-	#6	-
-	-	-	SPACE	20/1	29 C 30	-	PANELBOARD	-	#6	-

NEW PANELBOARD 'LP' IN NEW MCC

NOT TO SCALE

GENERAL NOTES:

- TRACE AND IDENTIFY ALL CIRCUITS FROM LOAD TO SOURCE PRIOR TO DISCONNECTING EX. MCC.

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS. THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.

BY: *Dorothy V. Valdez*

DEPARTMENT OF PUBLIC WORKS

HOWARD COUNTY, MARYLAND

*Janet R. Allen* 7/6/12  
 DIRECTOR OF PUBLIC WORKS DATE  
*Thomas J. Butler* 7/6/12  
 CHIEF, BUREAU OF ENGINEERING DATE  
*William C. Brown* 7/16/12  
 CHIEF, BUREAU OF UTILITIES DATE  
*Chris D. Jones* 7/16/12  
 CHIEF, UTILITY DESIGN DIVISION DATE  
 PSD



4201 Mitchellville Rd.  
 Suite 500  
 Bowie, Maryland 20716  
 (301) 731-5622  
 FAX: (301) 805-5984

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 24188. EXPIRATION DATE 12/31/2012.

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DSN. BY: JWK  
 DRN. BY: RMM  
 CHK. BY: JWK  
 DATE: SEPT. 2012

JWK	0	BID READY	09/12
BY	NO.	REVISION	DATE

SCHEDULES

600' SCALE MAP NO. 30 BLOCK NO. 10

ROUTE 29 BOOSTER PUMP STATION UPGRADE

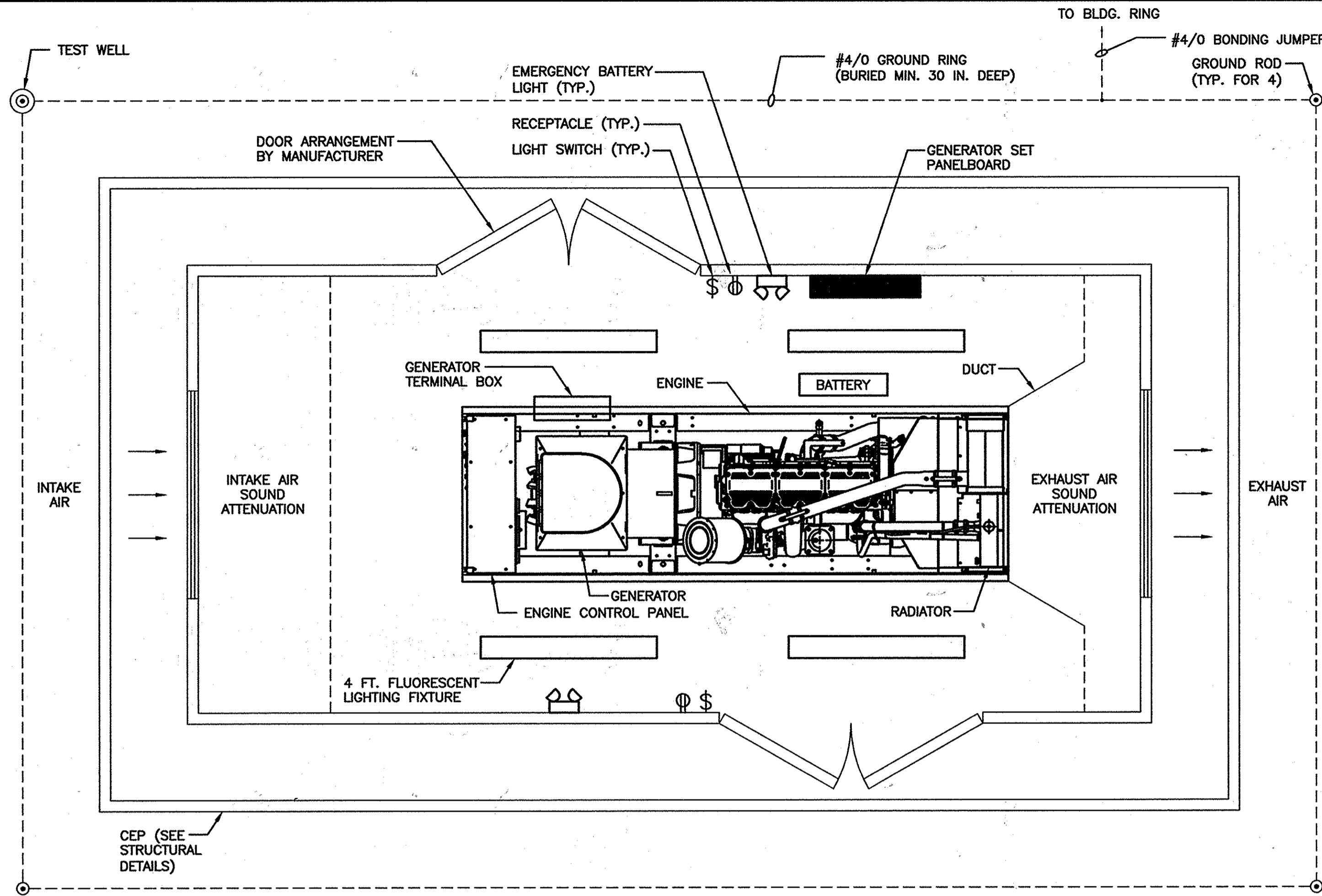
CAPITAL PROJECT: W-8200  
 CONTRACT NO.: 44-4661  
 ELECTION DISTRICT NO. 2  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

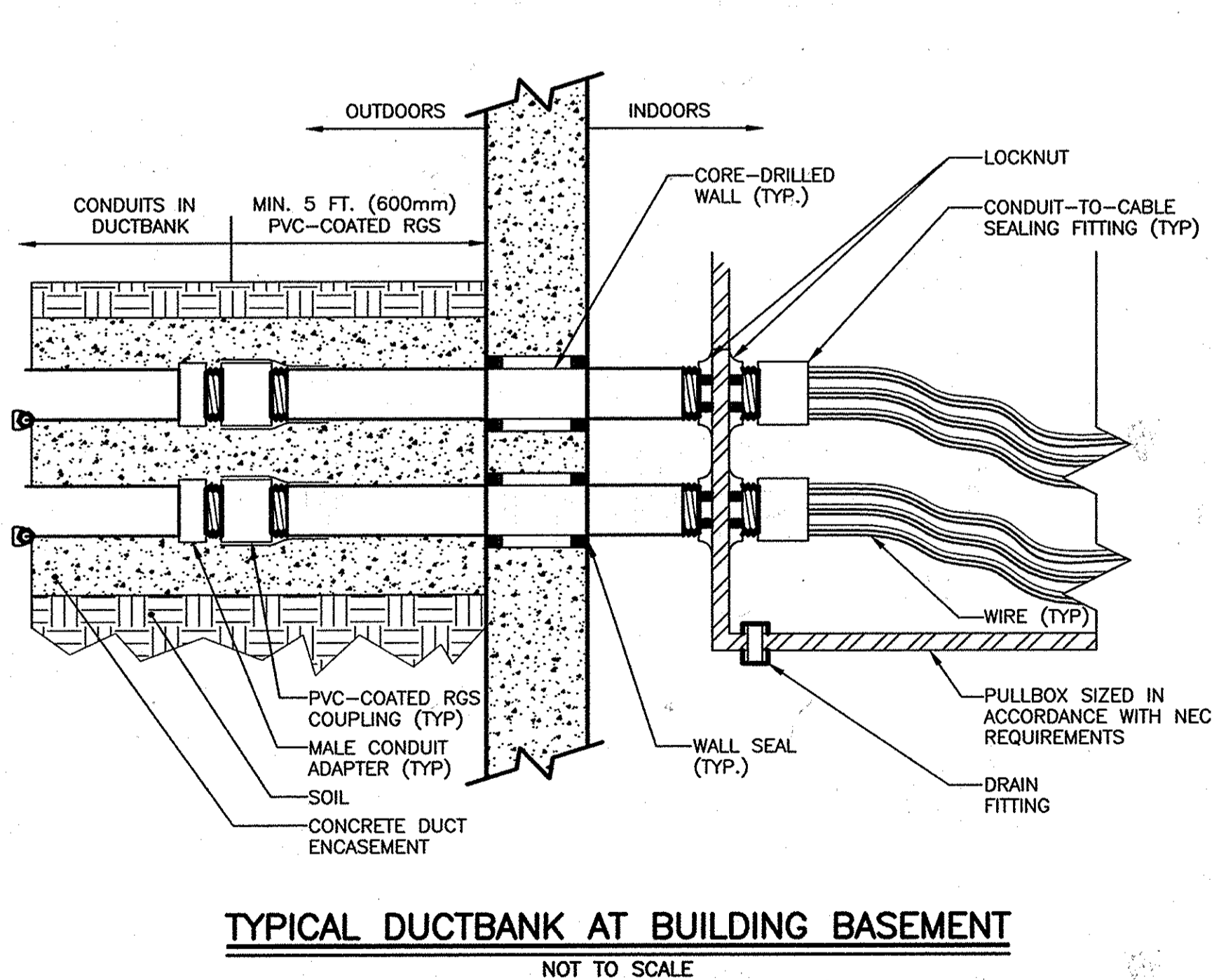
SHEET

8 OF 11

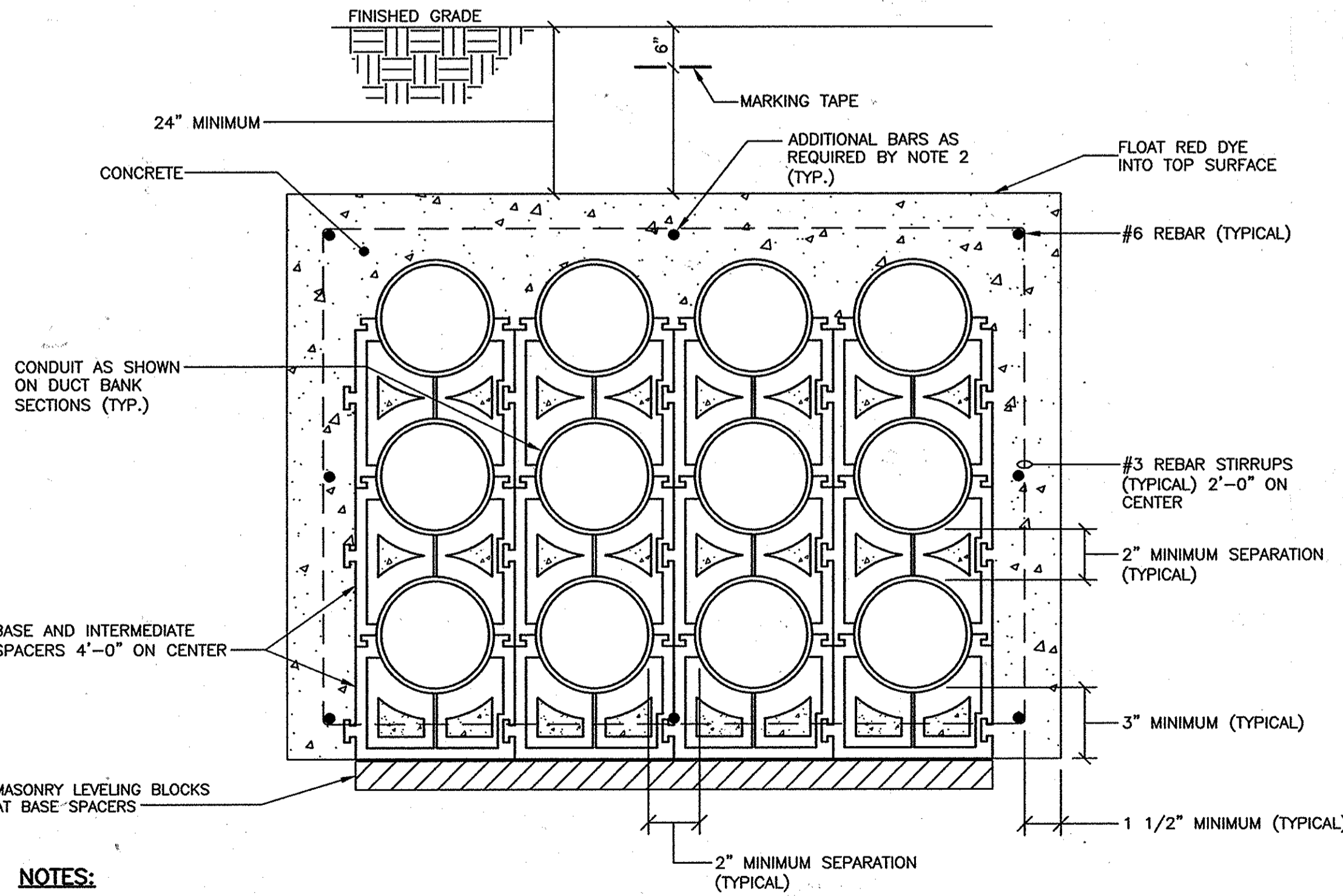




**STANDBY GENERATOR SET - PLAN**  
SCALE: 1/2"=1'-0"

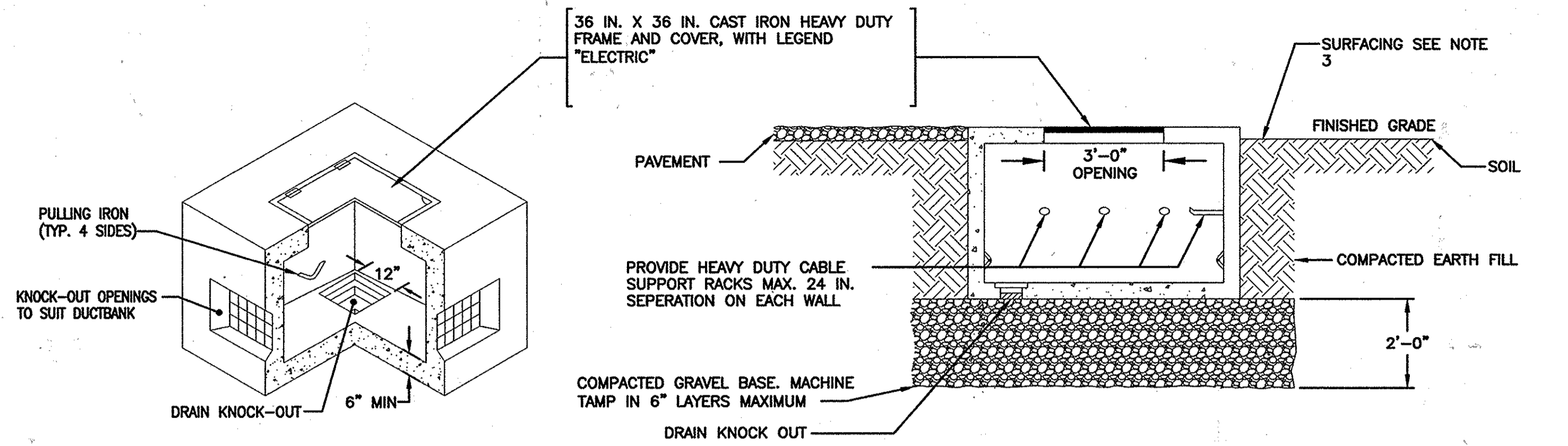


**TYPICAL DUCTBANK AT BUILDING BASEMENT**  
NOT TO SCALE



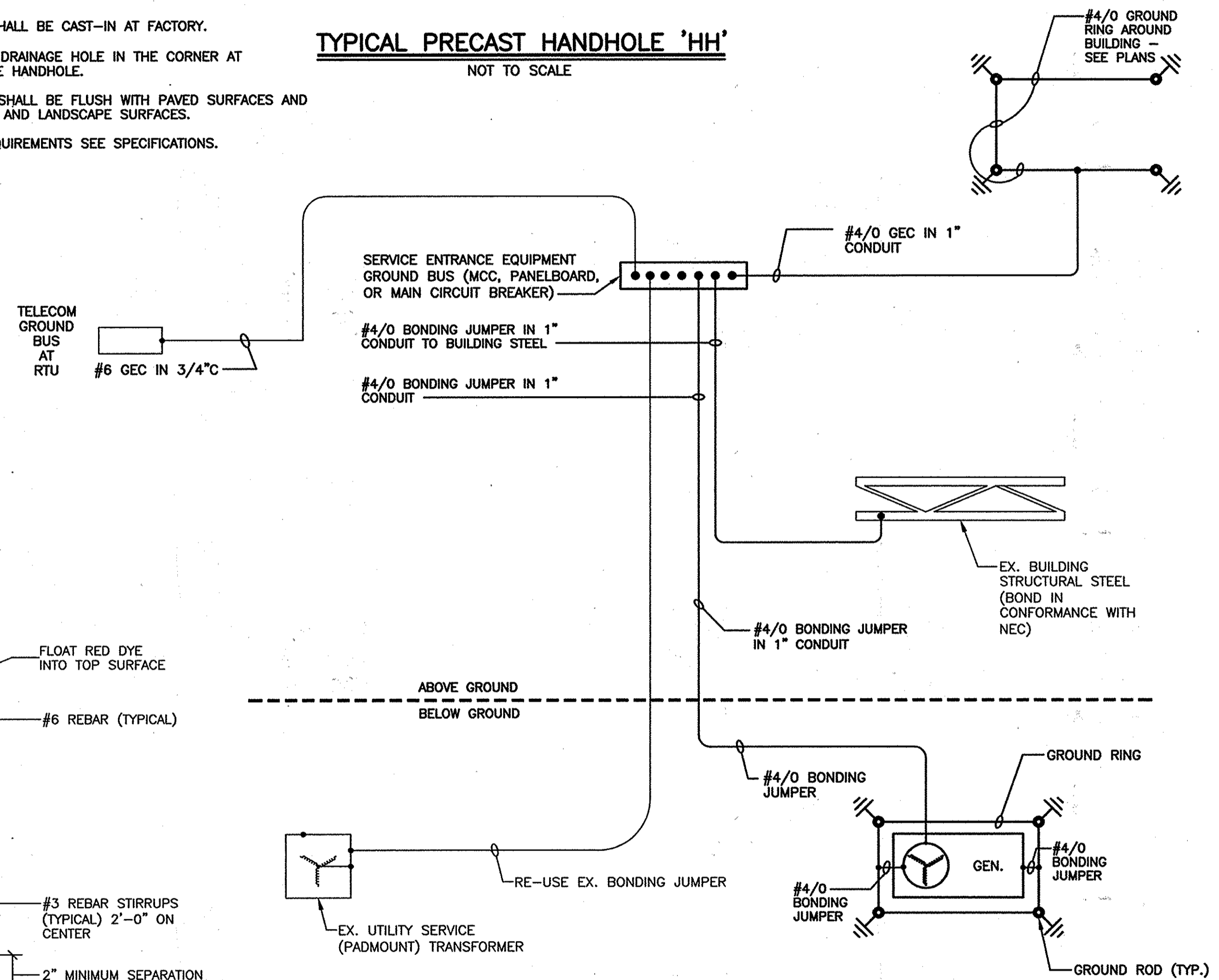
**TYPICAL DUCT BANK**  
NOT TO SCALE

- NOTES:**
- REFER TO DUCT BANK SECTIONS FOR CONDUIT SIZES.
  - MAX LONGITUDINAL SPACING OF #6 REBAR SHALL BE 12 INCHES.
  - REFER TO SPECIFICATION FOR CONDUIT REQUIREMENTS.



**TYPICAL PRECAST HANDHOLE 'HH'**  
NOT TO SCALE

- NOTES:**
- HANDHOLE COVER SHALL BE CAST-IN AT FACTORY.
  - PROVIDE 4" ROUND DRAINAGE HOLE IN THE CORNER AT THE BOTTOM OF THE HANDHOLE.
  - TOP OF HANDHOLE SHALL BE FLUSH WITH PAVED SURFACES AND 4 IN. ABOVE GRASS AND LANDSCAPE SURFACES.
  - FOR ADDITIONAL REQUIREMENTS SEE SPECIFICATIONS.



**GROUNDING SYSTEM**  
NOT TO SCALE

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS. THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *William VanBuren*

- GENERAL NOTES:**
- GENERATOR IS NOT A SEPARATELY DERIVED SYSTEM.
  - SOME GROUNDING SYSTEM COMPONENTS ARE NOT SHOWN ON PLANS. PROVIDE COMPLETE GROUNDING SYSTEM AS SHOWN ON THIS SHEET.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Sam Shaw* 9/12/12  
DIRECTOR OF PUBLIC WORKS DATE  
*William VanBuren* 9/12/12  
CHIEF, BUREAU OF UTILITIES DATE  
*Monica Smith* 9/12/12  
CHIEF, BUREAU OF ENGINEERING DATE  
*Debra Lee* 9/12/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE ENGINEERS, INC.**  
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DSN. BY: JWK					
DRN. BY: RMM					
CHK. BY: JWK					
DATE: SEPT. 2012	JWK	0	BID READY	09/12	
	BY	NO.	REVISION	DATE	

**ELECTRICAL DETAILS**

ROUTE 29 BOOSTER PUMP STATION UPGRADE  
CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO.: 2  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 9 OF 11

RE-USE EX. CONDUIT & WIRE

REMOVE EX. MCC

**SECTION 1**  
NOT TO SCALE

REMOVE EX. PUMP DISCONNECT SWITCHES

RE-USE EX. BELOW SLAB CONDUITS TO PUMPS

**SECTION 2**  
NOT TO SCALE

REMOVE EX. PUMP STATION CONTROL PANEL

**SECTION 3**  
NOT TO SCALE

REMOVE EX. GENERATOR SET AND APPURTENANCES

**SECTION 4**  
NOT TO SCALE

REMOVE EX. DUCT CONNECTION TO LOUVER

**SECTION 5**  
NOT TO SCALE

RELOCATE EX. EXHAUST FAN DISCONNECT SWITCH

**SECTION 6**  
NOT TO SCALE

EX. UTILITY CT CABINET TO REMAIN

**SECTION 7**  
NOT TO SCALE

EX. TELECOM SERVICE TO REMAIN

**SECTION 8**  
NOT TO SCALE

EX. TELEMETRY CABINET TO REMAIN

**SECTION 9**  
NOT TO SCALE

RE-USE EX. UTILITY SERVICE TRANSFORMER

RE-USE EX. REVENUE METERING

**SECTION 10**  
NOT TO SCALE

REMOVE EX. GENERATOR FUEL TANK

**SECTION 11**  
NOT TO SCALE

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *[Signature]*

**DRAWING NOTES:**

1 CONNECT TELEPHONE WIRE TO TERMINAL BLOCK. DISCONNECT AND REMOVE ALL OTHER DEVICES WITHIN THE CABINET.

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**DEPARTMENT OF PUBLIC WORKS**  
HOWARD COUNTY, MARYLAND

*[Signature]* 9/10/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 9/10/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 9/10/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE ENGINEERS, INC.**

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*[Professional Seal]*

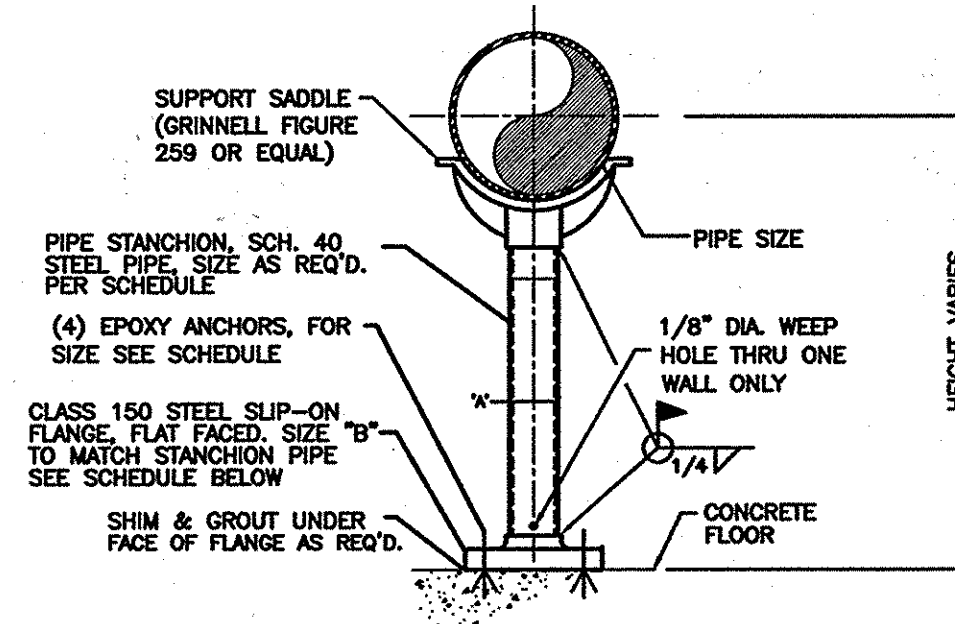
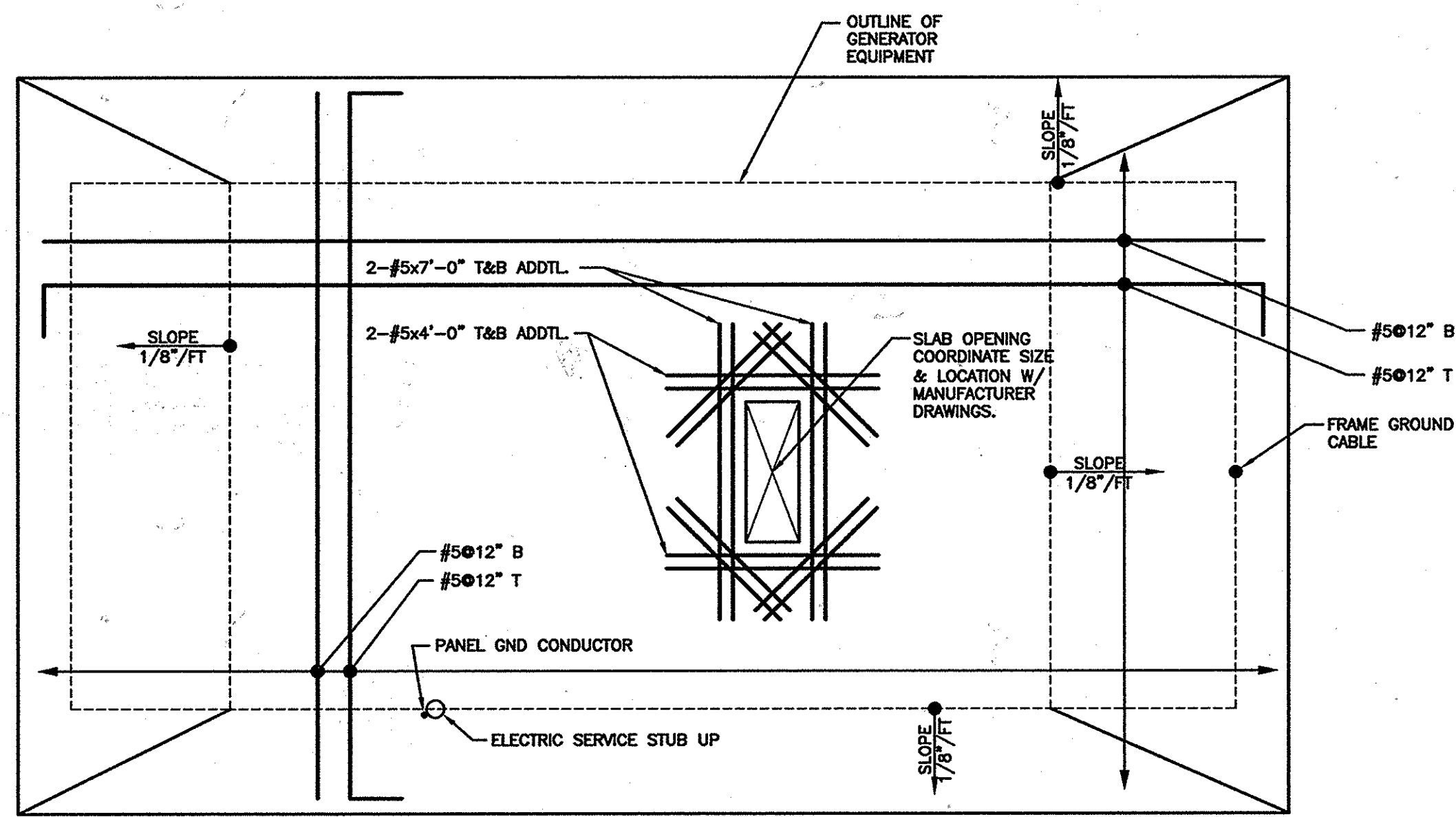
DSN. BY:	JWK				
DRN. BY:	RMM				
CHK. BY:	JWK				
DATE:	SEPT. 2012	JWK	0	BID READY	09/12
		BY	NO.	REVISION	DATE

<b>ELECTRICAL MODIFICATIONS</b>	
600' SCALE MAP NO.	30
BLOCK NO.	10

**ROUTE 29 BOOSTER PUMP STATION UPGRADE**

CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO.: 2  
HOWARD COUNTY, MARYLAND

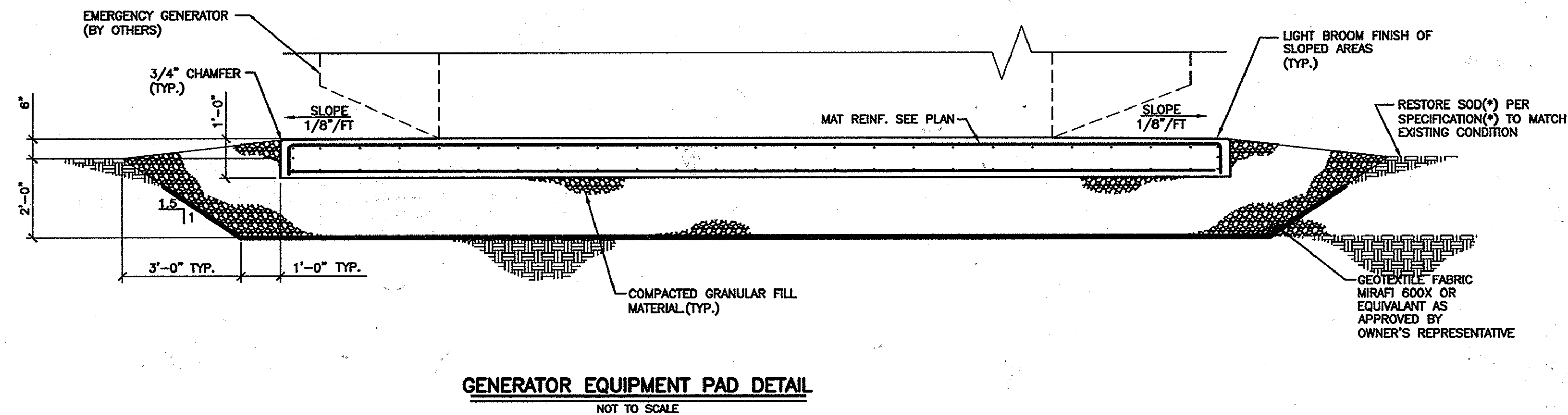
SCALE AS SHOWN  
SHEET 10 OF 11



SUPPORT DIMENSIONS SCHEDULE			
PIPE SIZE (INCHES)	"A"	"B" (MIN.)	ANCHOR SIZE
14 - 16	4	9	0.625
18 - 36	6	11	0.75

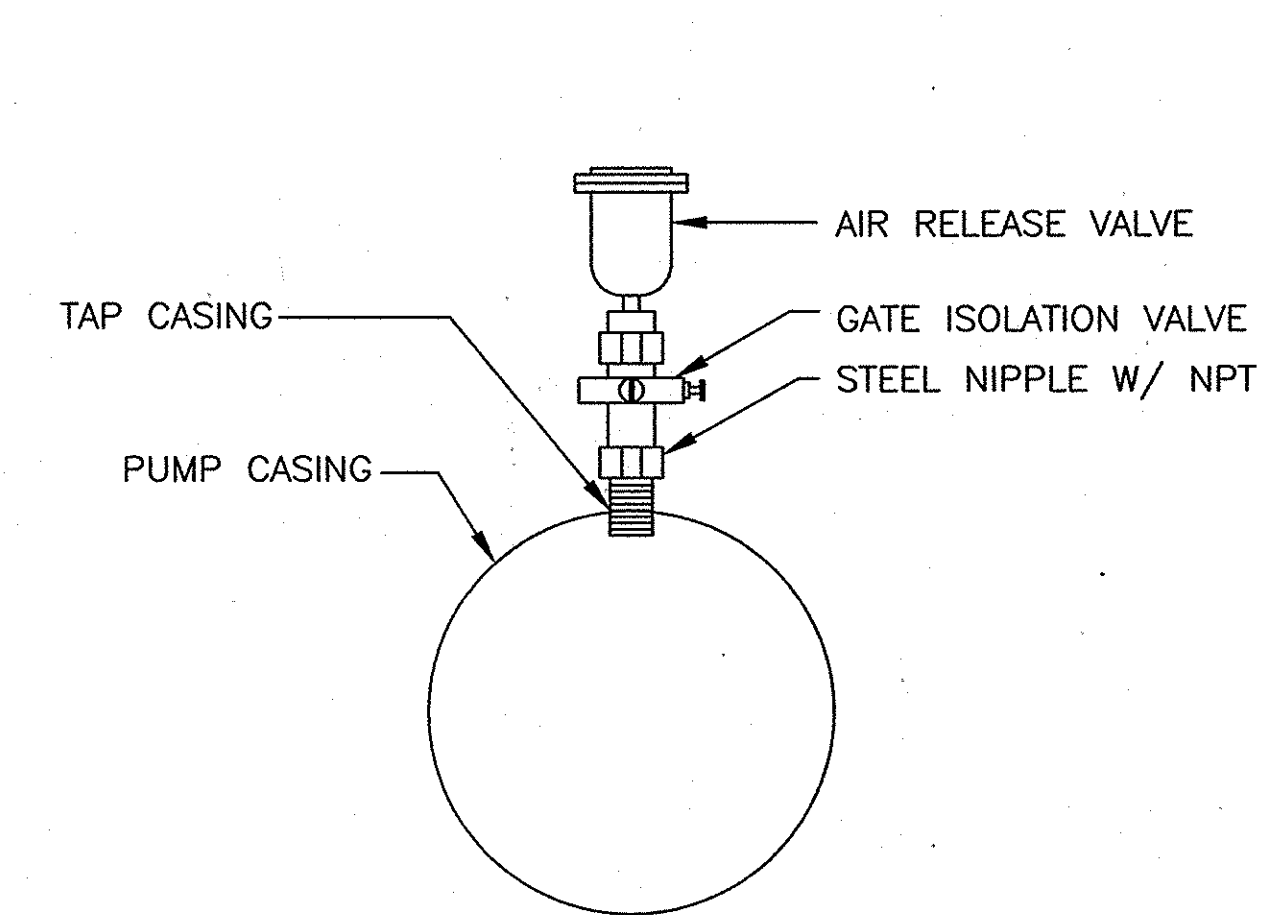
**DETAIL NOTES:**  
1. STANCHION STYLE PIPE SUPPORTS TO BE PAINTED PER SECTION 09900.

**STANCHION STYLE PIPE SUPPORT DETAIL**  
N.T.S.

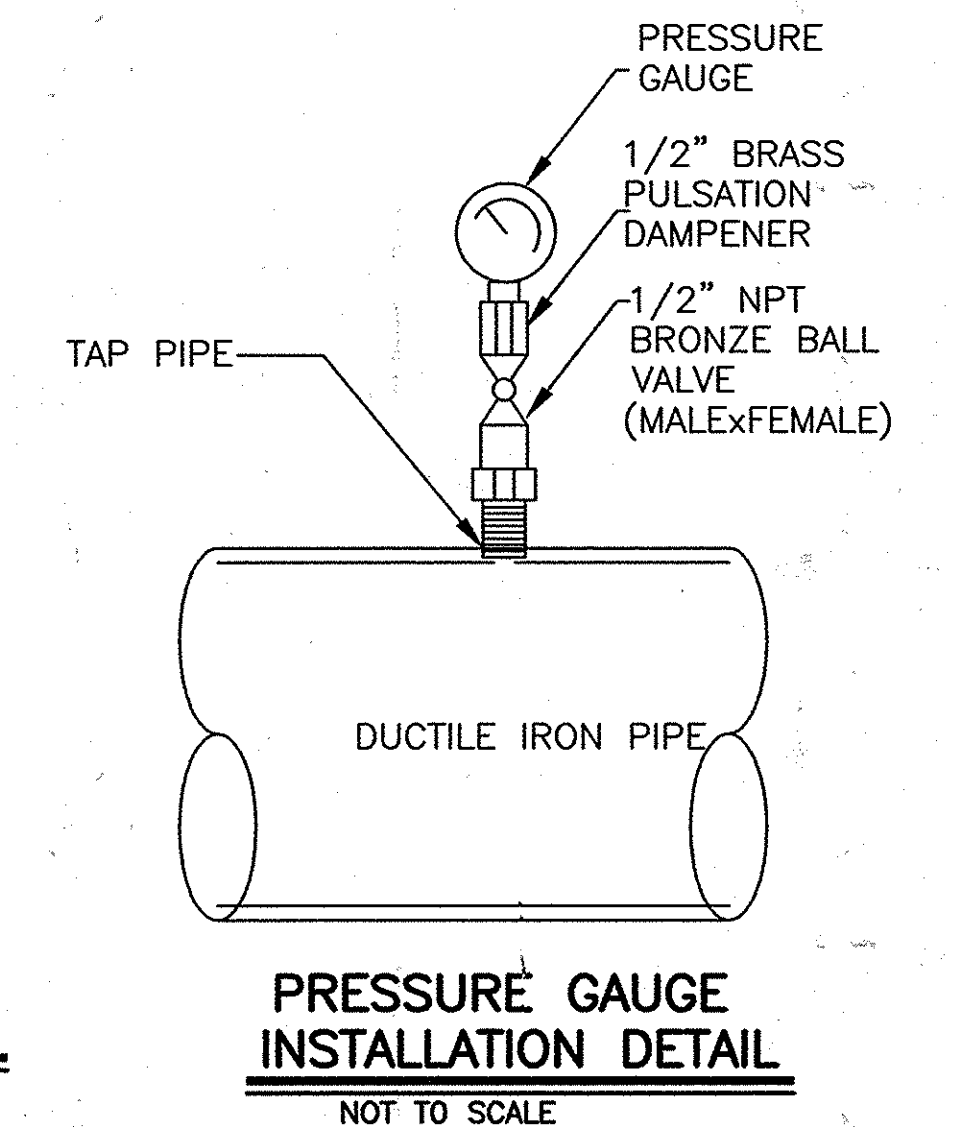


**DETAIL NOTES**

1. FOLLOW A.C.I. 301 AND 318 FOR CONCRETE WORK. FOLLOW A.C.I. 315 FOR CONCRETE REINFORCING AND ACCESSORIES.
2. MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,500 PSI.
3. AIR ENTRAINMENT SHALL BE 5%-7%, WATER/CEMENT RATIO SHALL BE 0.45, AND SLUMP SHALL BE 1-3"
4. CONCRETE REINFORCING: DEFORMED BARS, ASTM A-615, GRADE 60
5. CHAMFER EXPOSED CORNERS OF CONCRETE 3/4"
6. COORDINATE LOCATION OF ANY ACCESSORIES AND/OR REQUIRED PENETRATIONS WITH ELECTRICAL
7. BASE MATERIAL SHALL BE COMPACTED TO 95% MODIFIED PROCTOR, AND SHALL NOT CONTAIN ANY STANDING WATER PRIOR TO PLACEMENT OF CONCRETE



**NOTES:**  
1. STEEL NIPPLE AND GATE VALVE SHALL BE SAME SIZE AS AIR RELEASE VALVE



RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, BASED ON INFORMATION PROVIDED BY OTHERS. THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

O'BRIEN & GERE ENGINEERS, INC.  
BY: *William VanKatsen*

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John A. ...* 9/12/12  
DIRECTOR OF PUBLIC WORKS DATE

*Mona E. ...* 9/16/12  
CHIEF, BUREAU OF ENGINEERING DATE

*William ...* 9/16/12  
CHIEF, BUREAU OF UTILITIES DATE

*...* 9/16/12  
CHIEF, UTILITY DESIGN DIVISION DATE

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*...*  
PROFESSIONAL ENGINEER

DSN. BY: NV					
DRN. BY: JFM					
CHK. BY: RJD					
DATE: SEPT. 2012	RJD	0	BID READY	09/12	
	BY	NO.	REVISION	DATE	

MECHANICAL & STRUCTURAL  
DETAILS

600' SCALE MAP NO. 30 BLOCK NO. 10

ROUTE 29  
BOOSTER PUMP STATION UPGRADE

CAPITAL PROJECT: W-8200  
CONTRACT NO.: 44-4661  
ELECTION DISTRICT NO.: 2  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 11 OF 11