



# Hart Engineering Corporation

800 Scenic View Drive  
Cumberland, RI 02864

TRANSMITTAL NUMBER

37

**TITLE:** Electrical Asbuilts

**PROJECT:** Fram MA Edgell Rd. Water Pump Station Replacement

**DATE:** 08/30/2022

**JOB:** 9350.

**TO:** Beta Group Inc.  
701 George Washington HW  
Lincoln, RI 02865

**FROM:** Hart Engineering Corporation  
800 Scenic View Drive  
Cumberland, RI 02864

**ATTN:** James Dymont

**ATTN:** Nick George

**PHONE:** 1-401-333-2382

**PHONE:** 401-658-4600

**EMAIL:** jdymont@beta-inc.com

**EMAIL:** ngeorge@hartcompanies.com

Attached and/or enclosed are the following documents.

DOC TYPE	DOCUMENT #	COPIES	STATUS	REMARKS
	:Electrical Asbuilts	1	Submitted to Engineer	

Additional Notes:

Sincerely,  
Hart Engineering Corporation

DATE: 08/30/2022

\_\_\_\_\_  
Nick George



1/24/2020 10:06 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGELL WATER PUMPING STATION\ELECTRICAL\DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW.STB)

ELECTRICAL SYMBOLS	
	LINEAR FLUORESCENT LIGHTING FIXTURES "F1" INDICATES FIXTURE TYPE - TYPICAL FOR ALL FIXTURES "1" INDICATES CIRCUIT NUMBER - TYPICAL FOR ALL FIXTURES "0" INDICATES THE SWITCH CONTROL - TYPICAL FOR ALL FIXTURES
	WALL MOUNTED LIGHTING FIXTURE.
	SURFACE OR PENDANT MOUNTED FIXTURE.
	EMERGENCY EXIT SIGN
	EMERGENCY LIGHTING BATTERY UNIT WITH TWO LIGHT HEADS
	REMOTE EMERGENCY LIGHTING UNIT WITH TWO LIGHTING HEADS PROVIDE 3/4", 2#10, 1#10GND TO NEAREST THE EMERGENCY LIGHTING BATTERY UNIT
	SINGLE POLE SWITCH 120V, 20A "0" INDICATES THE SWITCH CONTROL
	2-POLE SWITCH 120V, 20A 1 POLE FOR ROOM LIGHT FIXTURES, 1-POLE FOR EXHAUST FAN CONTROL
	3-WAY SWITCH 120V, 20A "0" INDICATES THE SWITCH CONTROL
	DUPLEX RECEPTACLE, WEATHER-RESISTANT 120V, 20A WITH WEATHERPROOF COVER "1" INDICATES CIRCUIT NUMBER - TYPICAL FOR ALL RECEPTACLES
	DUPLEX RECEPTACLE 120V, 20A
	(2) DUPLEX (QUAD) RECEPTACLE 120V, 20A
	WALL MOUNTED DATA OUTLET, 2D INDICATES (2) CAT6 TERMINAL DATA CONNECTORS, 1T INDICATES (1) CAT6 TERMINAL TELEPHONE CONNECTOR
	UNFUSED DISCONNECT SWITCH, "30" INDICATES 30 AMP RATING, PROVIDE 3-POLE FOR 3-PHASE CIRCUITS AND 2-POLE FOR 1-PHASE CIRCUITS.
	FUSED DISCONNECT SWITCH, "20" INDICATES 20 AMP FUSE RATING, PROVIDE 3-POLE FOR 3-PHASE CIRCUITS AND 2-POLE FOR 1-PHASE CIRCUITS.
	3-PHASE RECEPTACLE
	WALL MOUNTED COMBINATION MOTOR STARTER WITH MOTOR CIRCUIT PROTECTOR, "FVNR" INDICATES TYPE OF MOTOR STARTER
	ENCLOSED VARIABLE FREQUENCY DRIVE
	MANUAL MOTOR STARTER 120V, 20A
	JUNCTION BOX
	HAND HOLE
	CONTROL RELAY, "CR1" REFERS TO RELAY NAME DESIGNATION
	TIMING RELAY, "TR1" REFERS TO RELAY NAME DESIGNATION
	NORMALLY OPEN RELAY CONTACT
	NORMALLY CLOSED RELAY CONTACT
	OPERATOR PUSH BUTTON NORMALLY OPEN CONTACT
	OPERATOR PUSH BUTTON NORMALLY CLOSED CONTACT
	PRESSURE SWITCH - CLOSSES ON HIGH PRESSURE
	PRESSURE SWITCH - CLOSSES ON LOW PRESSURE

ELECTRICAL SYMBOLS	
	UNDERGROUND CONDUIT DUCT BANK
	HOMERUN DESIGNATION TO PANEL PP1 CIRCUIT #1, WITH THE FOLLOWING CONDUIT/WIRES UNLESS OTHERWISE NOTED: <ul style="list-style-type: none"> <li>3/4" C WITH 2#12, 1#12GND FOR 20AMP SINGLE PHASE CIRCUITS.</li> <li>3/4" C WITH 3#12, 1#12GND FOR 20AMP THREE PHASE CIRCUITS.</li> <li>3/4" C WITH 2#10, 1#10GND FOR 30AMP SINGLE PHASE CIRCUITS.</li> <li>3/4" C WITH 3#10, 1#10GND FOR 30AMP THREE PHASE CIRCUITS.</li> <li>3/4" C WITH 2#8, 1#10GND FOR 40AMP &amp; 50AMP SINGLE PHASE CIRCUITS.</li> <li>3/4" C WITH 3#8, 1#10GND FOR 40AMP &amp; 50AMP THREE PHASE CIRCUITS.</li> </ul>
	EYS TYPE CONDUIT SEAL
	SURGE PROTECTION DEVICE
	UTILITY POLE
	MOLDED CASE CIRCUIT BREAKER, 3-POLE UNLESS OTHERWISE INDICATED, "20" INDICATES TRIP AMPERE RATING, "100" INDICATES FRAME SIZE, "GFCI" INDICATES CIRCUIT BREAKER TO HAVE GROUND FAULT CIRCUIT INTERRUPT
	3/4" X 10'-0" COPPER CLAD GROUND ROD
	BUILDING GROUNDING SYSTEM
	MOTOR, "10" INDICATES HORSEPOWER RATING
	CABLE/CONDUIT DESIGNATION, "XX" REFERS CABLE CONDUIT REFERENCE, REFER TO CABLE/CONDUIT SCHEDULES
	EMERGENCY STOP OR HAND SWITCH, "XXXX" REFERS TO TAGNAME ID
	OPERATOR STATION, "XXXX" REFERS TO TAGNAME ID
	UNLESS OTHERWISE NOTED INSTRUMENTATION OR PROCESS EQUIPMENT "XX-XXXX" REFERS TO TAGNAME ID
	GENERATOR EMERGENCY STOP
	THERMOSTAT
	HVAC RTU REMOTE USER INTERFACE
	MOTOR OPERATED DAMPER

SECURITY ALARM SYMBOLS	
	HEAT DETECTOR
	DOOR SWITCH
	MOTION DETECTOR
	SECURITY SYSTEM ALARM KEY PAD
	HELP CALL PUSHBUTTON - MOUNTED 18" AFF
	CCTV CAMERA
	SECURITY ALARM CONTROL PANEL
	FUTURE CARD READER PROVIDE BACKBOX, COVER PLATES AND EMPTY 3/4" CONDUIT WITH PULL STRING FROM BACKBOX TO ACS LOCATION
	FUTURE ELECTRIC LOCK PROVIDE JUNCTION BOX ABOVE DOOR, COVER PLATES AND EMPTY 3/4" CONDUIT WITH PULL STRING FROM BACKBOX TO ACS LOCATION
	FUTURE CARD ACCESS CONTROL SYSTEM CONTROL PANEL LOCATION, PROVIDE JUNCTION BOX WITH COVER FOR TERMINATION OF 120V BRANCH CIRCUIT.

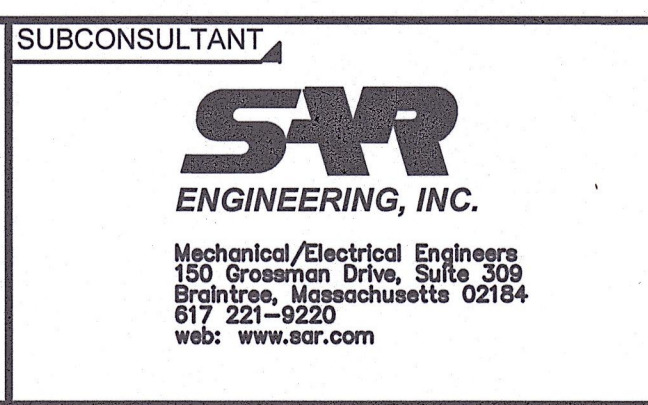
GENERAL NOTES	
1.	PROVIDE CONCRETE HOUSEKEEPING PADS ON ALL FLOOR OR GRADE MOUNTED ELECTRICAL EQUIPMENT, THE FOLLOWING EQUIPMENT IS THE MINIMUM REQUIREMENT FOR HOUSEKEEPING PADS. ADDITIONAL PADS MAYBE REQUIRED BASED ON THE MOUNTING METHODS. 1.1. MAIN DISTRIBUTION PANEL 1.2. GENERATOR 1.3. DRY TYPE TRANSFORMER 1.4. VARIABLE FREQUENCY DRIVES
2.	ALL CONDUIT AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.
3.	BACK BOXES SHALL BE RECESSED INTO WALLS, RACEWAYS SHALL BE INSTALLED IN WALLS WHERE POSSIBLE AND ABOVE SUSPENDED CEILING, ONLY VERTICAL RUNS OF RACEWAY SHALL BE ALLOWED TO BE EXPOSED.
4.	BONDING JUMPERS, CONDUIT CLAMPS AND POINTS OF ATTACHMENT ARE NOT SHOWN ON DRAWINGS. SIZE BONDING JUMPERS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. THE POINTS OF ATTACHMENT OF THE GROUND CLAMPS SHALL BE IN ACCESSIBLE LOCATIONS.
5.	EQUIPMENT & CONDUIT INSTALLATIONS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO BEAMS AND WALLS.
6.	CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTIONS TO MOTORS AND OTHER EQUIPMENT.
7.	NO CONDUIT SMALLER THAN 3/4" PIPE SIZE NOR WIRE SMALLER THAN NO. 12 A.W.G. SHALL BE USED UNLESS OTHERWISE NOTED.
8.	RECEPTACLES AND SWITCHES SHALL BE MOUNTED 45" ABOVE FINISHED FLOOR.
9.	THE WIRING AND BLOCK DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL AND PROCESS EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
5.	THE CONTRACTOR SHALL COORDINATE WITH EVERSOURCE AND VERIZON FOR NEW SERVICES TO THE UPGRADED BUILDING.

DEMOLITION NOTES	
1.	UNLESS OTHERWISE NOTED, ALL EXISTING ELECTRICAL SYSTEMS (POWER, LIGHTING, LOW VOLTAGE, CONTROLS, ETC) AND ASSOCIATED EQUIPMENT IS TO BE DEMOLISHED OR SALVAGED. DISCONNECT AND DE-ENERGIZE THE EQUIPMENT. REMOVE THE EQUIPMENT TO BE DEMOLISHED OR SALVAGED PER SECTION 02050. ALL CONTROL DEVICES, CONDUIT, CABLING, BOXES, SUPPORTS, ETC, ASSOCIATED WITH THE DEMOLISHED EQUIPMENT SHALL BE REMOVED. THE CONDUIT AND CABLING SHALL BE REMOVED BACK TO SOURCE.
2.	DISCONNECT AND REMOVE THE ELECTRICAL SERVICE BACK TO UTILITY POLE AND MAKE THE PUMP STATION SAFE FOR COMPLETE BUILDING DEMOLITION. COORDINATE WITH THE UTILITY COMPANY FOR DISCONNECTION OF SERVICE AT TRANSFORMERS.
3.	NO DEVICE OR EQUIPMENT INDICATED FOR DEMOLITION WILL BE REUSED OR SALVAGED UNLESS SPECIFICALLY NOTED AS SUCH. ALL EQUIPMENT REMOVED SHALL BE REMOVED FROM SITE AND PROPERLY DISPOSED OF, PRIOR TO REMOVAL OF EQUIPMENT COORDINATE WITH OWNER FOR ANY EQUIPMENT THE OWNER WILL KEEP.
4.	EXISTING EQUIPMENT INDICATED ON THE DEMOLITION PLANS ARE BASED ON SITE OBSERVATIONS AND IT IS NOT THE INTENTION OF THESE DRAWINGS TO SHOW ALL EQUIPMENT AND MATERIALS TO BE DISCONNECTED AND/OR REMOVED.
5.	THE CONTRACTOR SHALL COORDINATE WITH EVERSOURCE AND VERIZON FOR DISCONNECTION OF SERVICES TO THE EXISTING BUILDING.

ABBREVIATIONS	
(2)1" C, 3#8, #10GND	2. 1-INCH CONDUITS EACH CONDUIT CONTAINING 3-#8 AWG WIRES AND 1-#10 GROUND CONDUCTOR
3/4" CE	EMPTY CONDUIT. NUMERAL DENOTES SIZE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AR	ALARM RELAY
ATS	AUTOMATIC TRANSFER SWITCH
CR	CONTROL RELAY
CP	CONTROL PANEL
DRG. DWG.	DRAWING
EAN	EXCEPT AS NOTED
EC	ELECTRICAL CONTRACTOR
ETM	ELAPSED TIME METER
FE	FLOW ELEMENT
FIT	FLOW INDICATOR TRANSMITTER
FIR	FLOW INDICATOR CHART RECORDER
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
FVNR	FULL VOLTAGE NON-REVERSING
GND, GRD	GROUNDING CONDUCTOR (EQUIPMENT)
HOA	HAND-OFF-AUTOMATIC
HH	HANDHOLE
J OR JB	JUNCTION BOX
JPB	JOG PUSHBUTTON
LE	LEVEL ELEMENT
LIT	LEVEL INDICATOR TRANSMITTER
LL	LOW LEVEL
LS	LEVEL SWITCH
LT	LEVEL TRANSMITTER
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MH	MANHOLE
NTS	NOT TO SCALE
OH	OVERHEAD
OL	MOTOR OVERLOAD HEATER
PB	PUSHBUTTON CONTROL STATION MOMENTARY CONTACT TYPE, STOP START
PBL	PUSHBUTTON CONTROL STATION MOMENTARY TYPE WITH LOCK-OUT DEVICE, STOP-START
PBM	PUSHBUTTON CONTROL STATION MAINTAINED CONTACT TYPE, STOP START
PIT	PRESSURE INDICATOR TRANSMITTER
PL	PUSHBUTTON CONTROL STATION MOMENTARY TYPE WITH LOCK-OUT DEVICE, STOP
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
RGS	RIGID GALVANIZED STEEL
SPD	SURGE SUPPRESSOR DEVICE
SOV	SOLENOID VALVE
S/S	SOFT STARTER
TB	TERMINAL BOX
TD	MOTOR TEMPERATURE DETECTOR
TR	TIMING RELAY
TS	TEMPERATURE SWITCH
TSP	TWISTED SHIELDED PAIR
TSTW	TWO SPEED TWO WINDING
TYP	TYPICAL
UG	UNDERGROUND
UIR	MULTI CHANNEL INDICATOR CHART RECORDER
VFD	VARIABLE FREQUENCY DRIVE
WP	WATER PROOF

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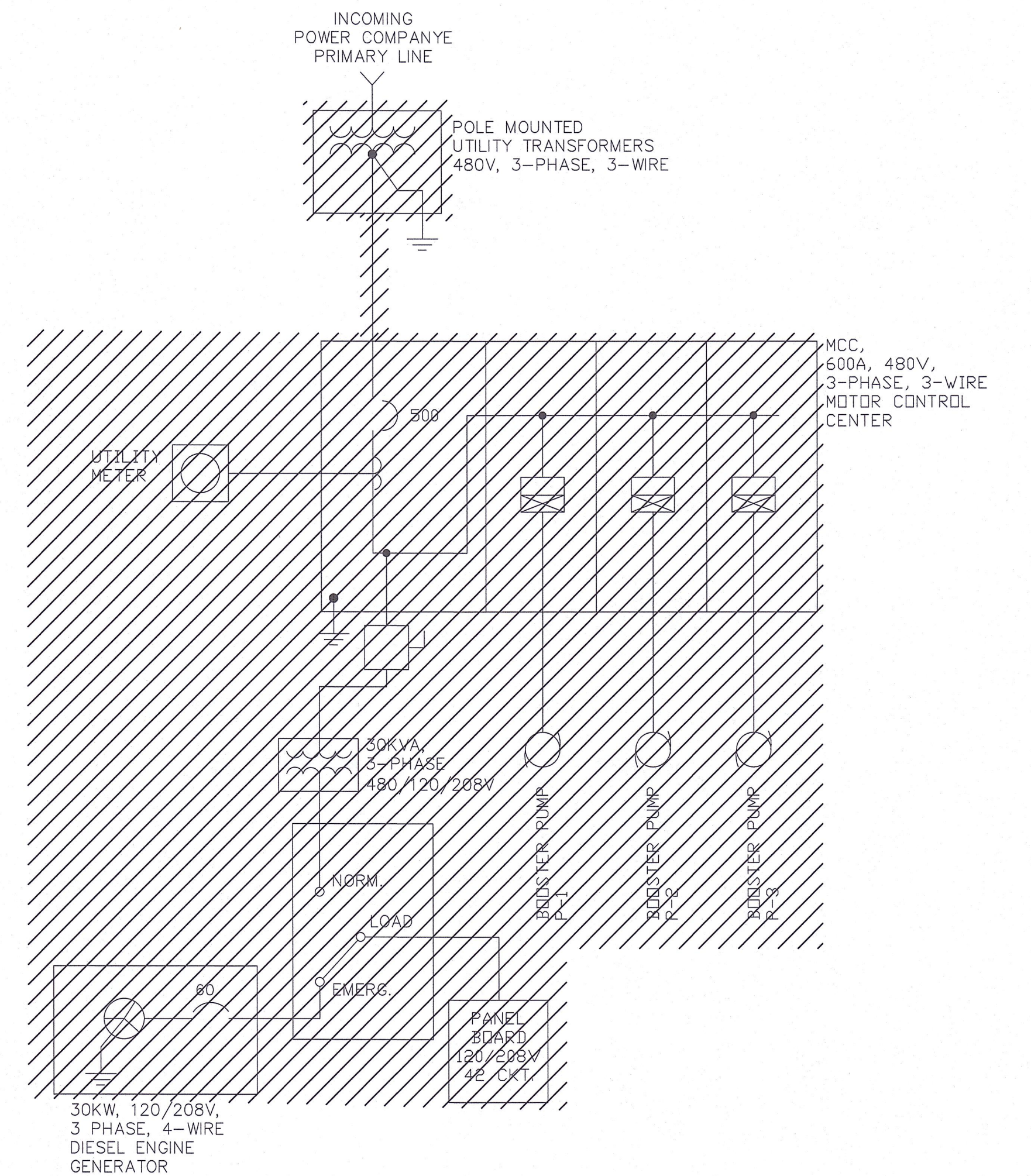
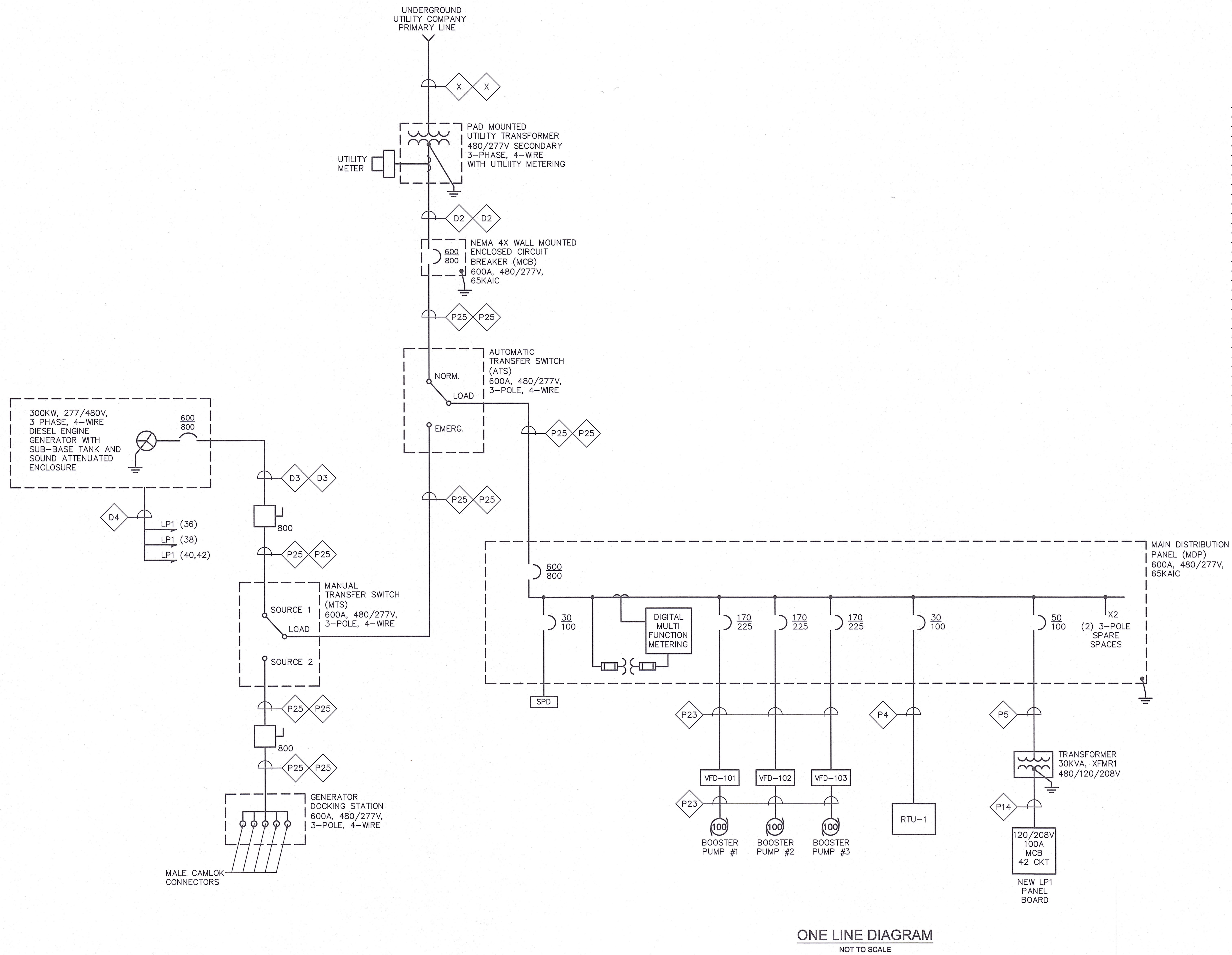
SUBCONSULTANT	SCALE NONE	TITLE Edgell Road Water Pumping Station Replacement ELECTRICAL LEGEND AND GENERAL NOTES
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BETA JOB NO. 6481	ISSUE DATE JANUARY 2020	SHEET NO. E-1
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1/24/2020 10:05 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGELL WATER PUMPING STATION\ELECTRICAL DEPARTMENT\18004.00 ELEC.DWG (BETA STB.BM.STB)



ONE LINE DIAGRAM - DEMOLITION  
NOT TO SCALE

ONE LINE DIAGRAM  
NOT TO SCALE

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DRAWN BY:  
RLB  
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MJC  
CHECKED BY:  
MJC

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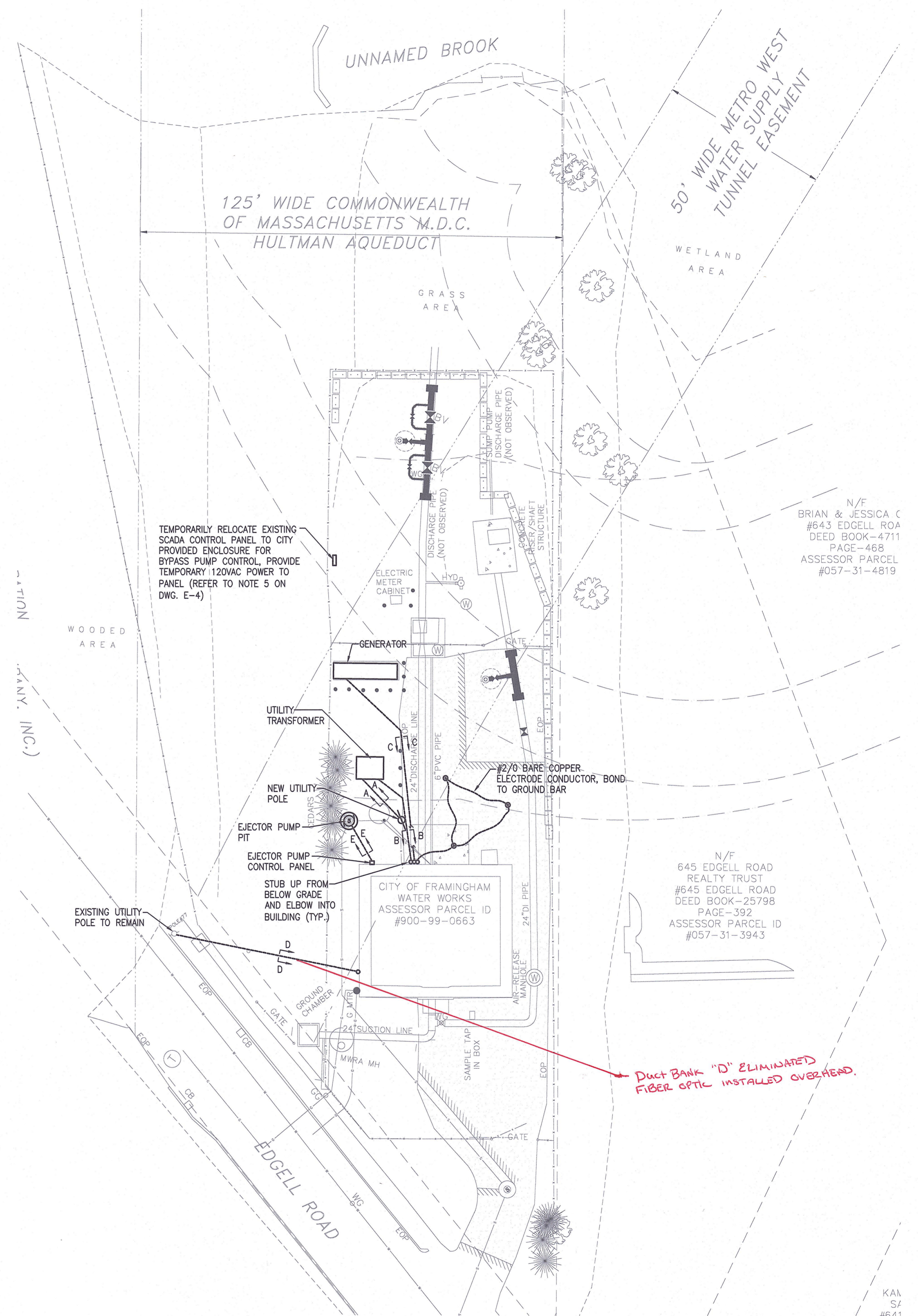
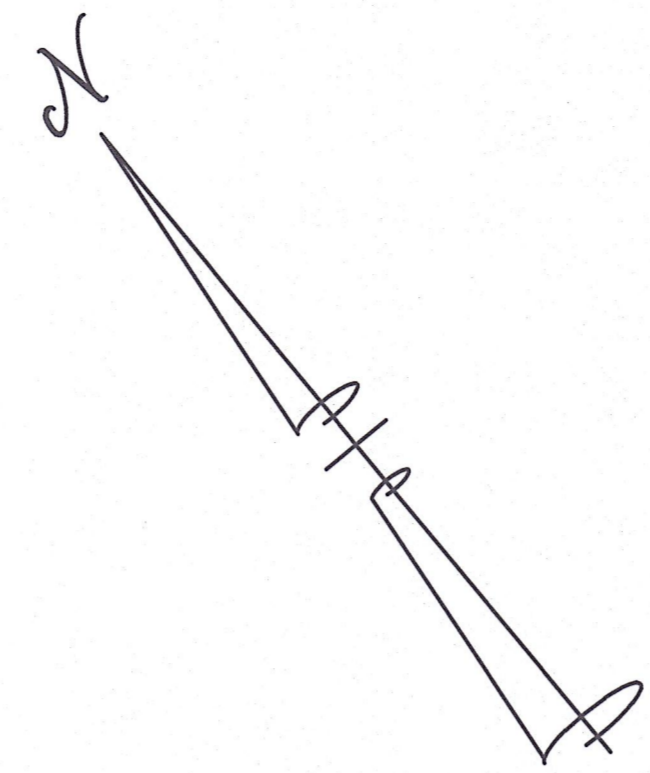
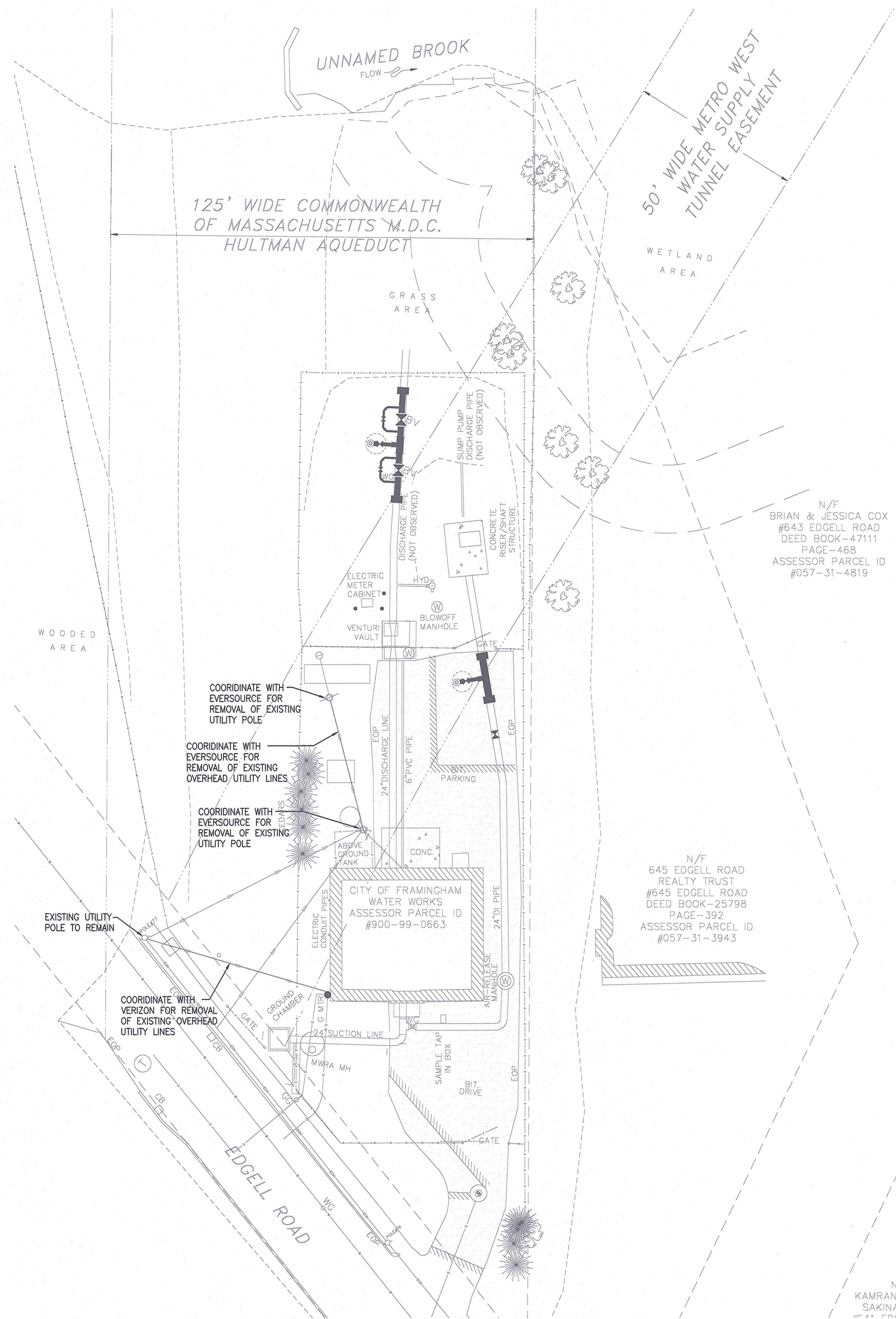
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**Edgell Road Water Pumping Station Replacement ELECTRICAL ONE LINE DIAGRAM**

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1/24/2020 10:01 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGELL WATER PUMPING STATION\ELECTRICAL\DEPARTMENT\18004.00 ELEC.DWG (BETA SITE BW.SIB)



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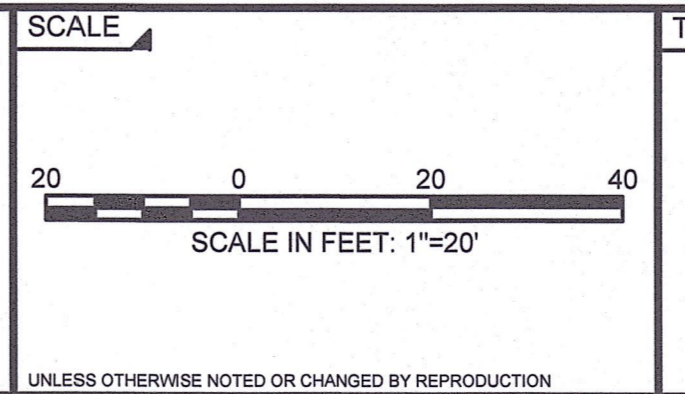
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MJC



SUBCONSULTANT

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150 Greenman Drive, Suite 309  
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617-221-9220  
web: www.swr.com



TITLE

**Edgell Road Water Pumping Station Replacement ELECTRICAL SITE PLAN**

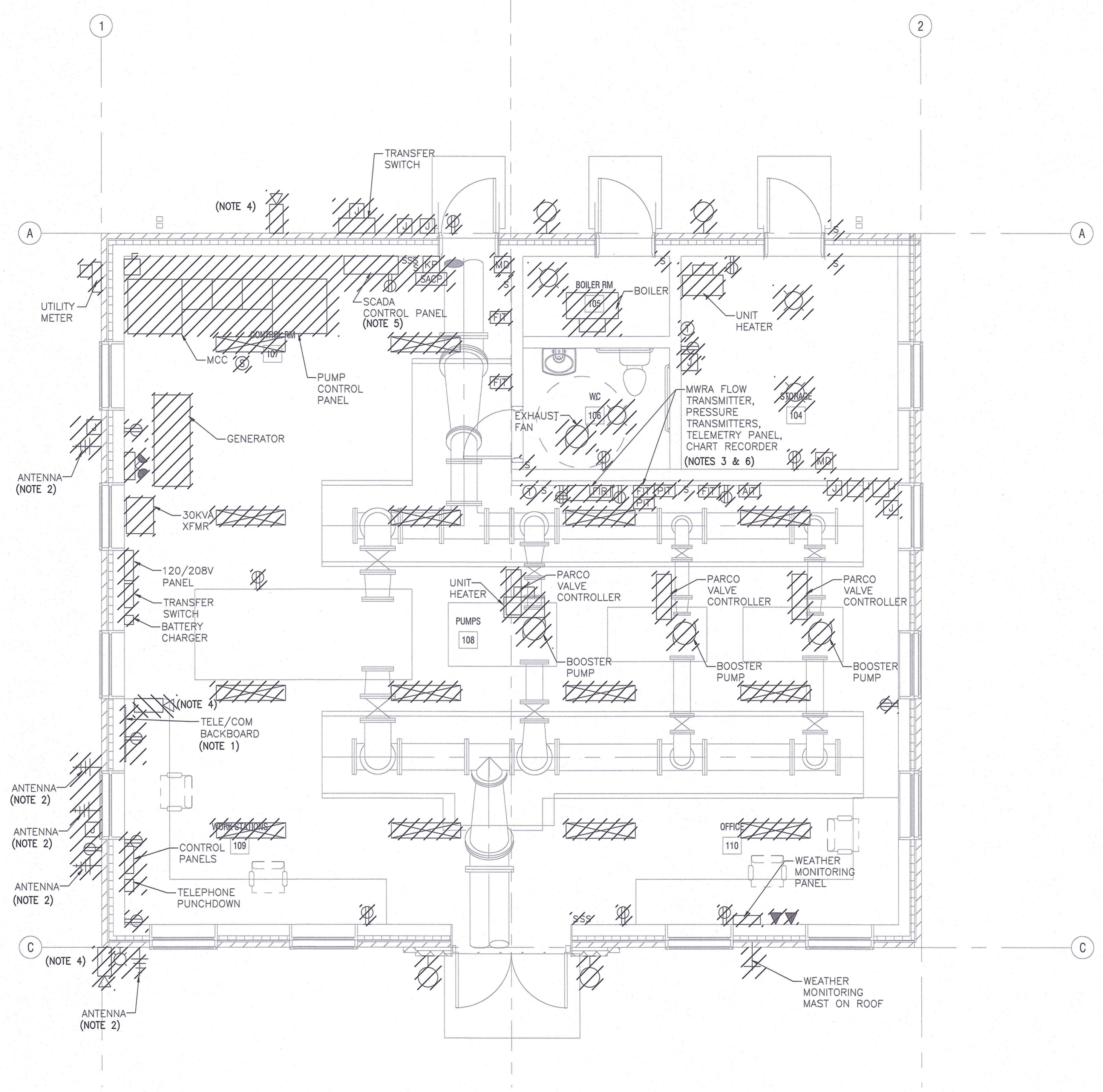
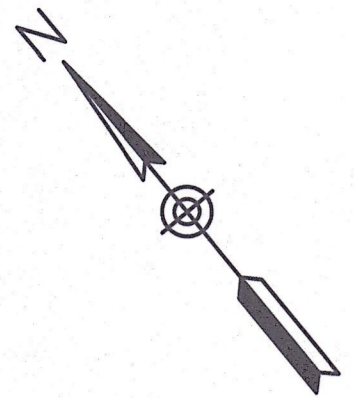
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ISSUE DATE JANUARY 2020

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**DEMOLITION PLAN**  
SCALE: 1" = 4'

- NOTES:**
- DISCONNECT AND REMOVE TELE/COM, RACK MOUNTED EQUIPMENT, AND EQUIPMENT RACK. EQUIPMENT SHALL BE RETURNED TO OWNER.
  - DISCONNECT AND REMOVE ANTENNA EQUIPMENT AND EQUIPMENT RACK. PROPERLY STORE THE ANTENNAS ASSOCIATED WITH THE SCADA CONTROL PANEL AND THE MWRA TELEMETRY PANEL AND REINSTALL IN NEW PUMP STATION.
  - DISCONNECT AND REMOVE MWRA FLOW TRANSMITTER, PRESSURE TRANSMITTERS, CHART RECORDER AND TELEMETRY PANEL. PROPERLY STORE AND REINSTALL IN NEW PUMP STATION.
  - DISCONNECT AND REMOVE CCTV CAMERA. PROPERLY STORE AND REINSTALL IN NEW PUMP STATION.
  - PRIOR TO DEMOLITION PHASE PROVIDE (12)#14 TEMPORARY WIRING FROM SCADA CONTROL PANEL TO BYPASS PUMP CONTROL PANEL, PROVIDE (1)#16TSP TEMPORARY WIRING FROM SCADA CONTROL PANEL TO TEMPORARY FLOW METER, WIRE TO BE IN FLEXIBLE CONDUIT. FOR DEMOLITION PHASE DISCONNECT AND RELOCATE SCADA CONTROL PANEL, SCADA ANTENNA, ANTENNA CABLE AND SPD TO THE VICINITY OF THE BYPASS PUMP CONTROL PANEL, RECONNECT TEMPORARY WIRING AND PROVIDE TEMPORARY 120VAC TO SCADA CONTROL PANEL. PROVIDE TEMPORARY WEATHER TIGHT SHELTER FOR MOUNTING OF THE CONTROL PANEL AND ANTENNA MOUNTING.
  - FOR DEMOLITION PHASE DISCONNECT AND RELOCATE MWRA TELEMETRY CONTROL PANEL, ANTENNA, ANTENNA CABLE AND SPD TO THE VICINITY OF THE RELOCATED SCADA CONTROL PANEL, PROVIDE (1)#16TSP TEMPORARY WIRING FROM SCADA CONTROL PANEL TO MWRA TELEMETRY PANEL, TEMPORARY WIRE TO BE FLEXIBLE CONDUIT, PROVIDE TEMPORARY 120VAC TO SCADA CONTROL PANEL. PROVIDE TEMPORARY WEATHER TIGHT SHELTER FOR MOUNTING OF THE MWRA TELEMETRY PANEL AND ANTENNA MOUNTING.

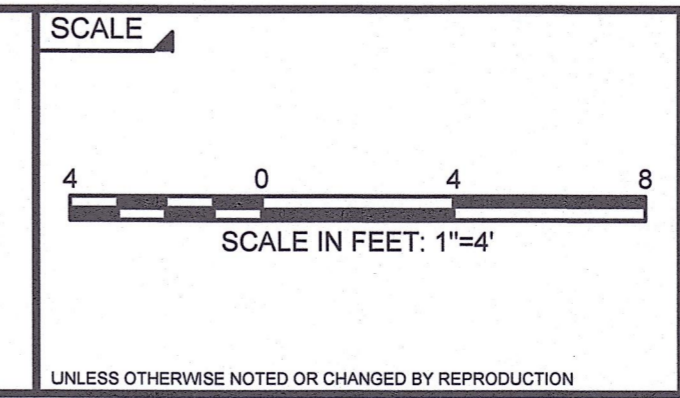
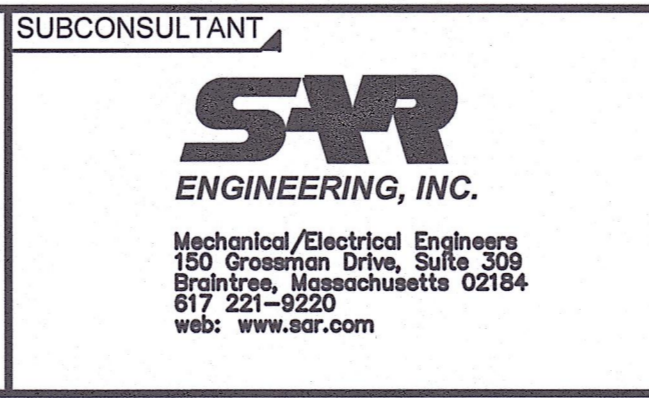
1/24/2020 10:01 AM W:\YEAR - 2016\18004.00 - FRAMINGHAM EDGELL WATER PUMPING STATION\ELECTRICAL\DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW.STB)

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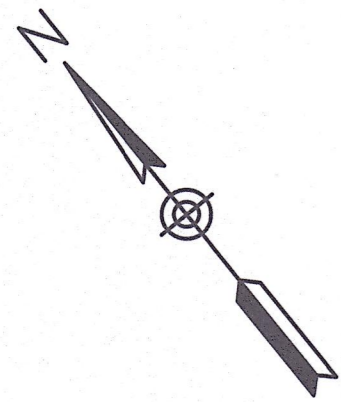
**Edgell Road Water Pumping Station Replacement ELECTRICAL DEMOLITION PLAN**

BETA JOB NO. 6481

ISSUE DATE JANUARY 2020

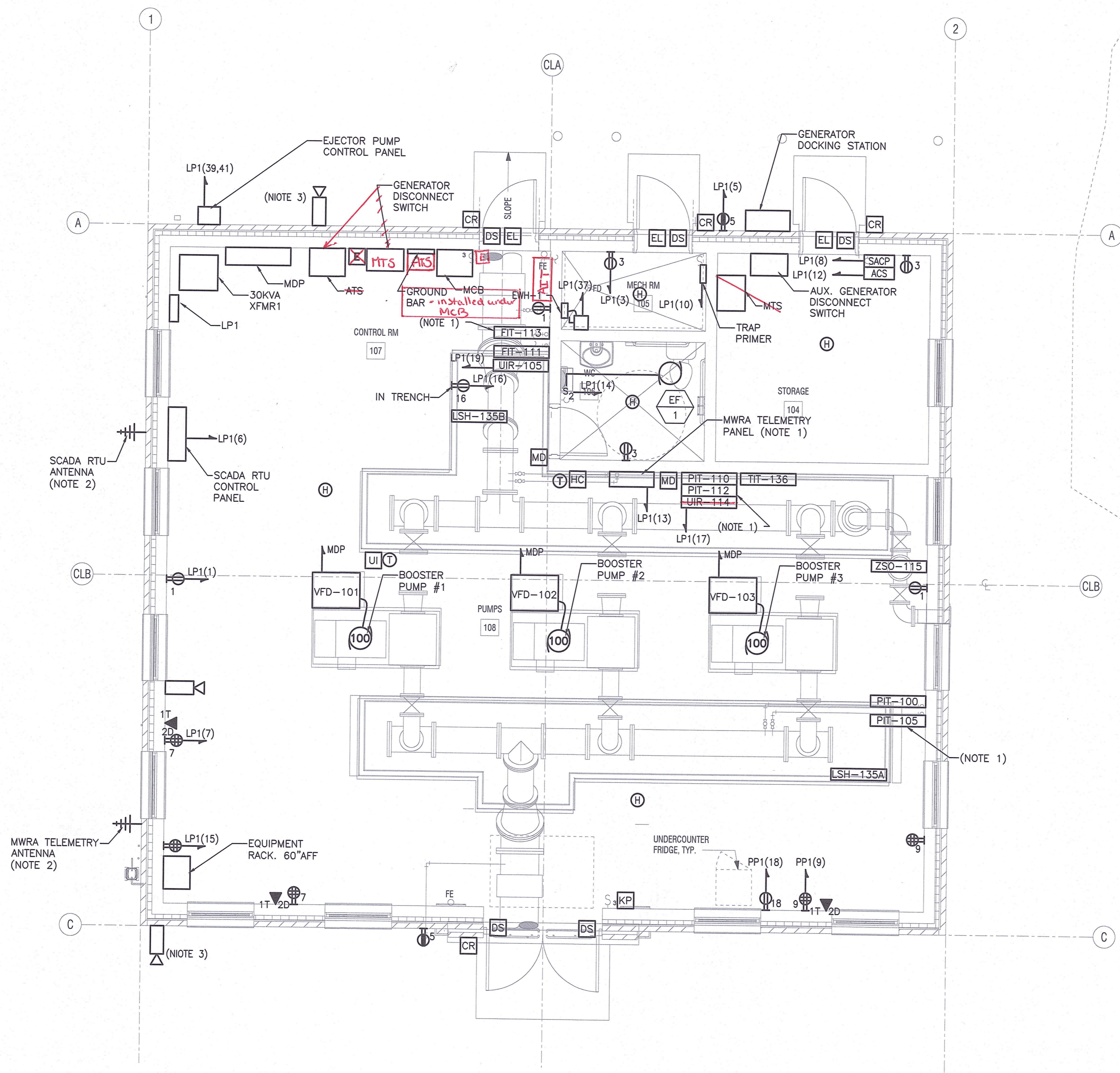
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**NOTES:**

1. MWRA FLOW TRANSDUCER (FIT-113), PRESSURE TRANSDUCERS (PIT-105 & PIT-112), CHART RECORDER (MIR-114) AND TELEMETRY PANEL REMOVED FROM OLD PUMP STATION.
2. ANTENNAS ASSOCIATED WITH THE SCADA CONTROL PANEL, THE MWRA TELEMETRY PANEL, THE REMOTE I/O PANEL REMOVED FROM OLD PUMP STATION.
3. CAMERA BRACKET TO BE MOUNTED TO PLATE WITHIN ROOF COORDINATED LOCATION AND MOUNTING WITH ARCHITECTURAL DRAWINGS.

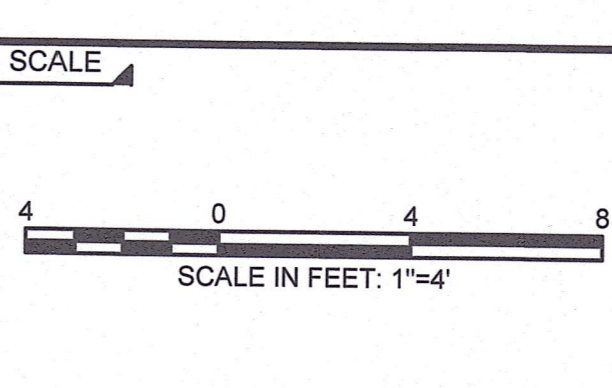
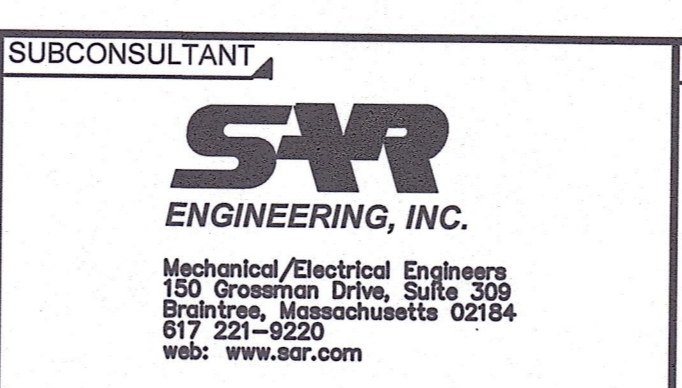
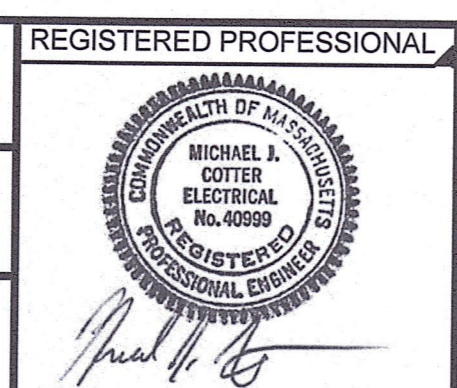


**POWER AND LOW VOLTAGE PLAN**  
SCALE: 1" = 4'

1/24/2020 10:03 AM W:\YEAR - 2018\18004.00 - FRAMMINGHAM EDGEHILL WATER PUMPING STATION\ELECTRICAL DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW.STB)

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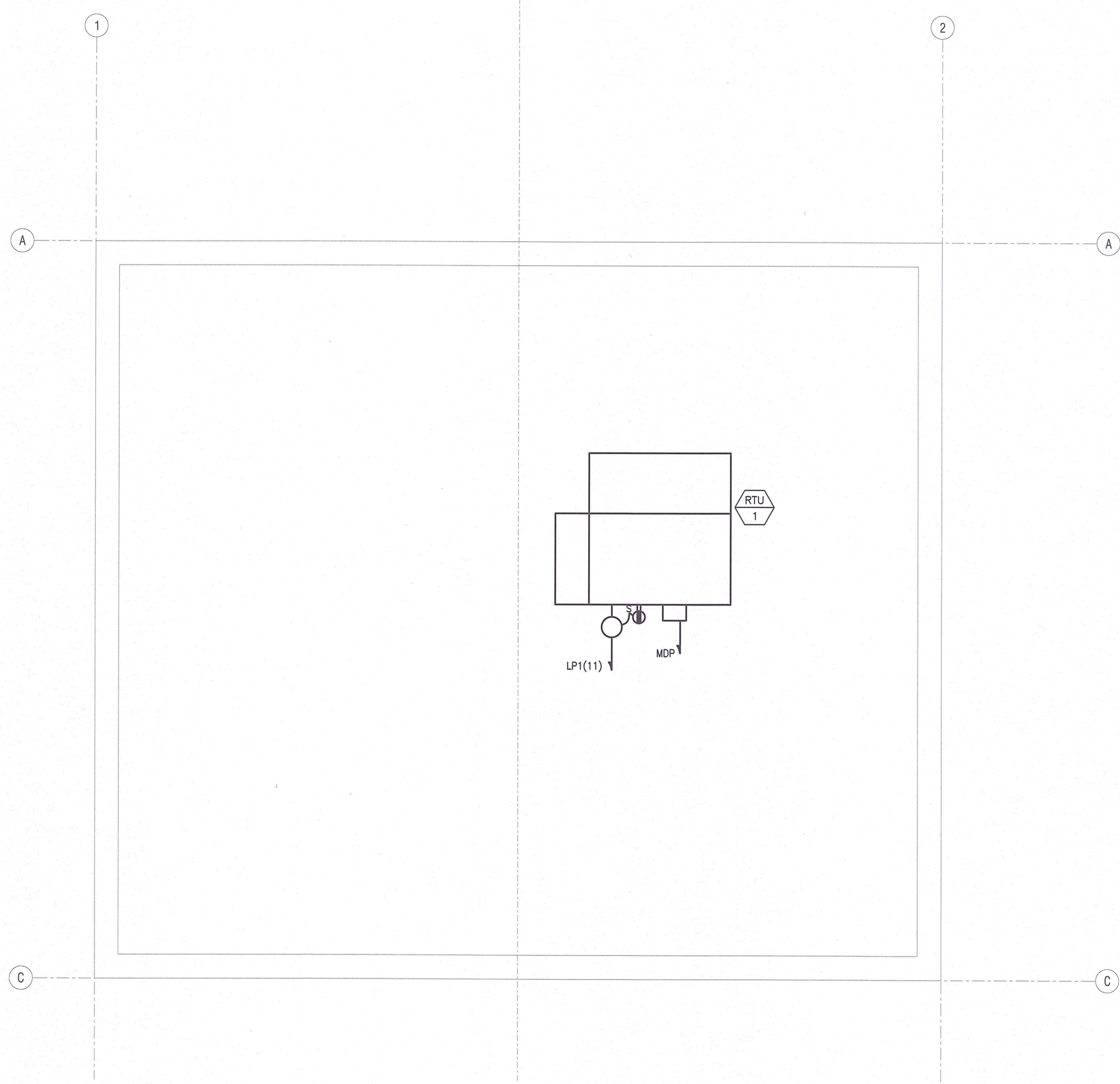
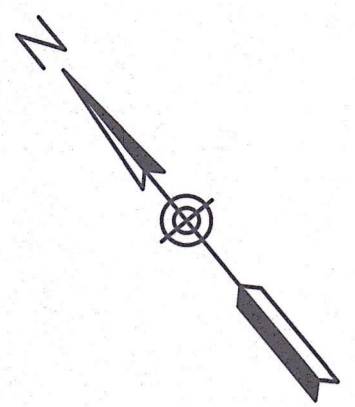


**Edgell Road Water Pumping Station Replacement**  
**ELECTRICAL**  
**POWER AND LOW VOLTAGE PLAN**

BETA JOB NO. 6481  
ISSUE DATE JANUARY 2020  
SHEET NO. E-5

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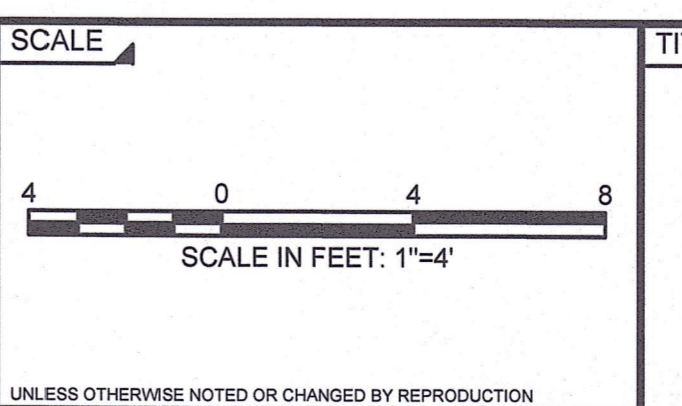
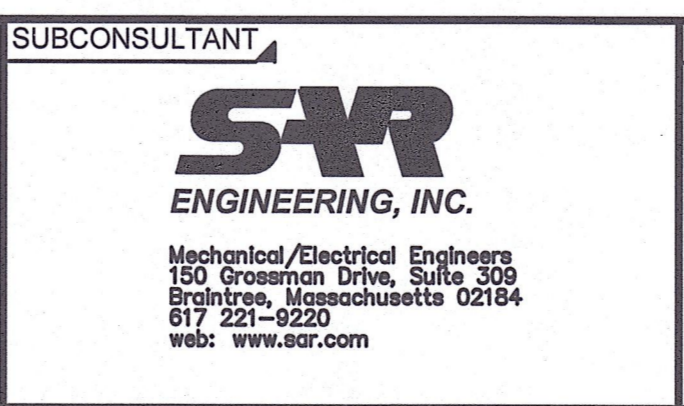
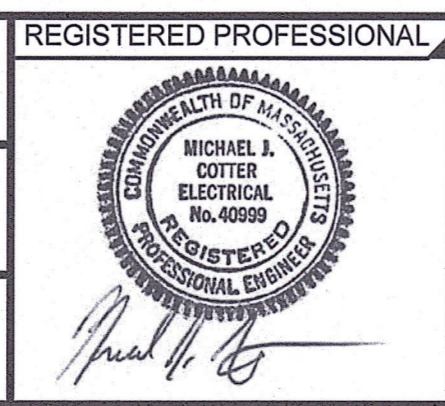


**ROOF PLAN**  
SCALE: 1" = 4'

12/24/2020 10:03 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGEHILL WATER PUMPING STATION\ELECTRICAL DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW.STB)

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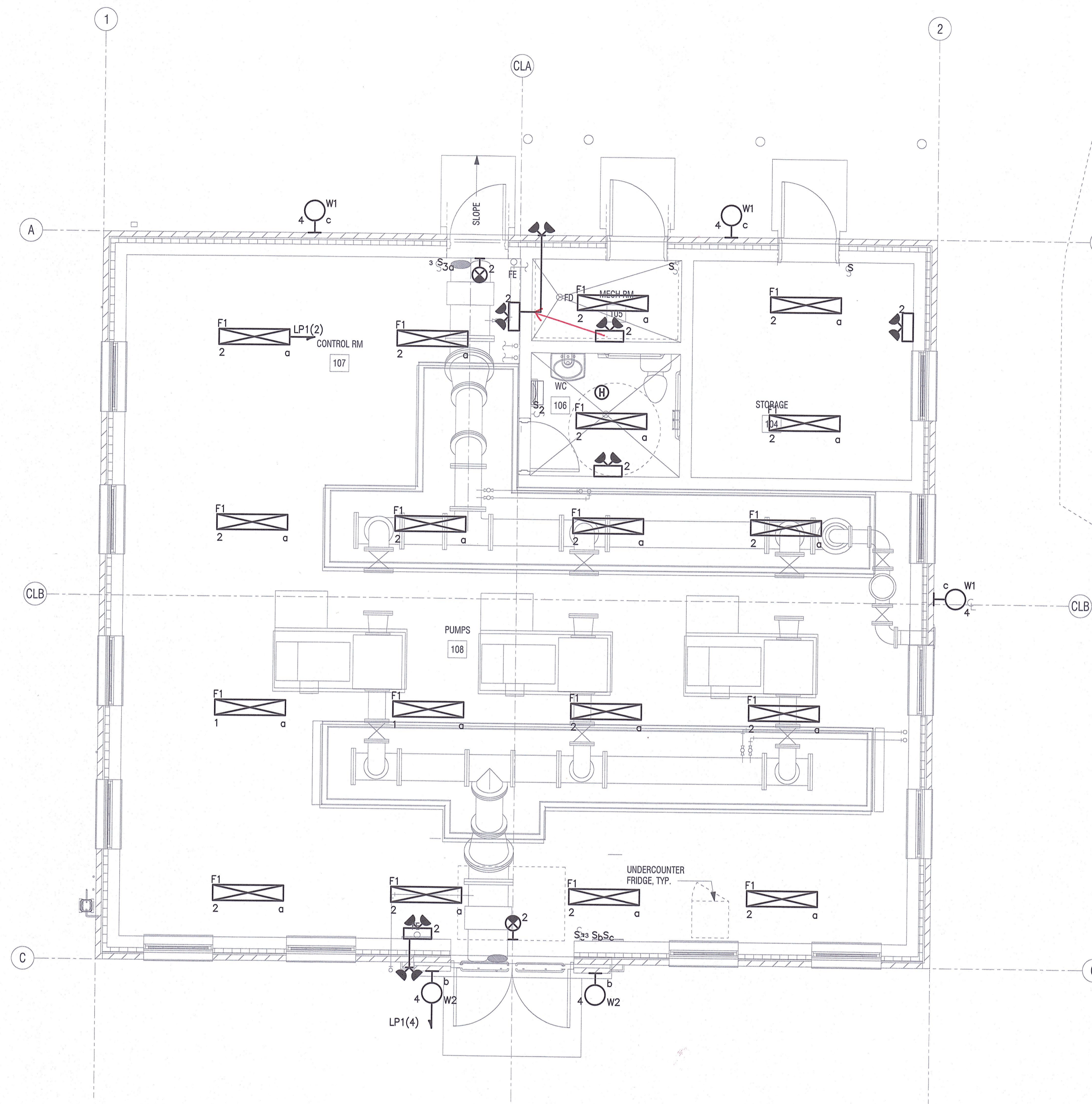
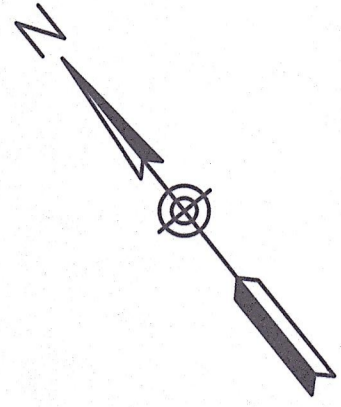


TITLE

**Edgell Road Water  
Pumping Station Replacement  
ELECTRICAL  
ROOF PLAN**

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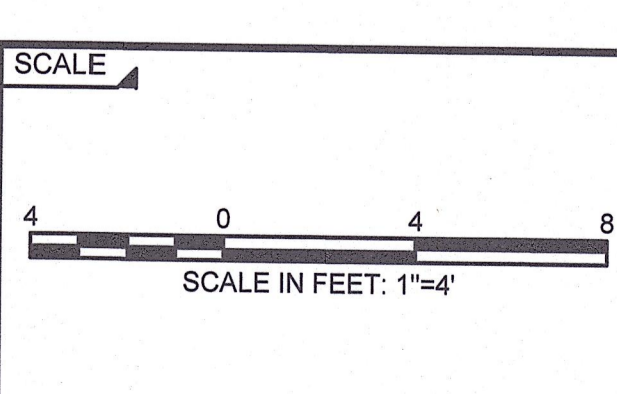
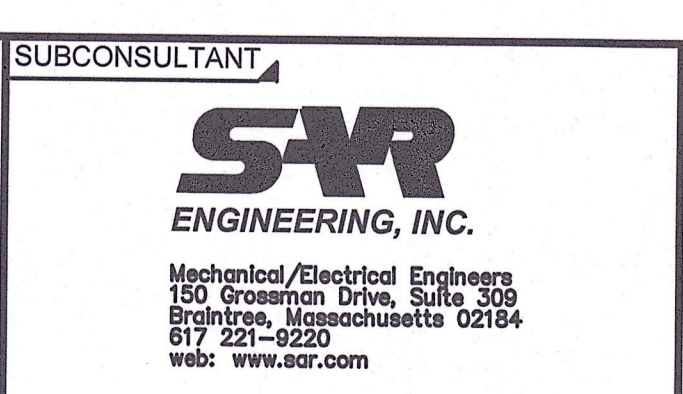
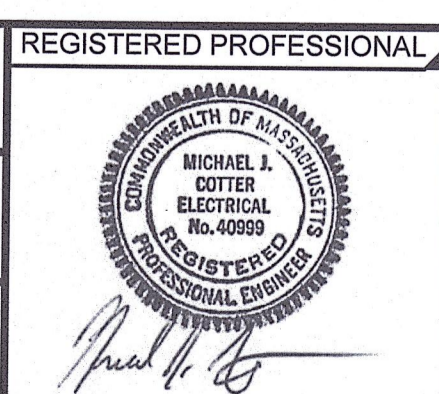


**LIGHTING PLAN**  
SCALE: 1" = 4'

1/24/2020 10:51 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGEHILL WATER PUMPING STATION\ELECTRICAL DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW.BTB)

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:  
RLB  
DESIGNED BY:  
MJC  
CHECKED BY:  
MJC



TITLE

**Edgell Road Water Pumping Station Replacement ELECTRICAL LIGHTING PLAN**

BETA JOB NO. 6481  
ISSUE DATE JANUARY 2020  
SHEET NO. E-7

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION



LIGHTING FIXTURE SCHEDULE									
TYPE	DESCRIPTION	MANUFACTURER & CATALOG SERIES	LAMPS		VOLTS	WATTS	MOUNTING		REMARKS
			TYPE	LUMENS			TYPE	HEIGHT	
F1	48" LED ENCLOSED AND GASKETED INDUSTRIAL LIGHTING FIXTURE.	LITHONIA FEM-L48-4000LM-IMFL-MVOLT-35K-80CRI	LED 3500K	4000lm	120	31	CEILING	SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.	-
W1	EXTERIOR BUILDING MOUNTED LED WALL PACK LIGHT FIXTURE	LITHONIA TWP-LED-20C-700-40K-T3M-MVOLT-PE-DDXB	LED 4000K	4200lm	120	45	WALL	SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND MOUNTING HEIGHTS.	INTEGRAL PHOTOCELL CONTROLLED
W2	EXTERIOR HEXAGONAL WALL MOUNT ANTIQUE BRONZE FINISH SEEDY GLASS SHADE WALL MOUNT LIGHT FIXTURE	HOLLAND 838081ST	B-10 LED 4000K	600lm	120	6	WALL	SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND MOUNTING HEIGHTS.	-
	SELF CONTAINED EMERGENCY LIGHTING BATTERY UNIT NEMA 4 WITH TWO LIGHTING HEADS	REFER TO SPECIFICATIONS	LED	-	120	8W	WALL	SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND MOUNTING HEIGHTS.	INSTALL 3/4"C, 2#12, 1#12GND TO REMOTE HEADS
	SEALED-BEAM WEATHERPROOF REMOTE LIGHTING FIXTURE WITH TWO LIGHTING HEADS	REFER TO SPECIFICATIONS	LED	-	120	8W	WALL	SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND MOUNTING HEIGHTS.	-
	EMERGENCY EXIT SIGN LED TYPE WITH BATTERY BACK-UP NEMA 4X	REFER TO SPECIFICATIONS	LED	-	120	3W	WALL	SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND MOUNTING HEIGHTS.	-

LIGHTING FIXTURE SCHEDULES NOTES:

- THE CATALOG NUMBERS LISTED ARE GIVEN AS A GUIDE TO THE DESIGN AND QUALITY OF FIXTURE DESIRED. EQUIVALENT DESIGNS, MATERIALS, DIMENSIONS, COEFFICIENT OF UTILIZATIONS AND EQUAL QUALITY FIXTURES OF OTHER MANUFACTURERS WILL BE ACCEPTABLE.

POWER CABLE/CONDUIT SCHEDULE			
SYMBOL	CONDUIT SIZE*	CONDUCTORS*	GND*
P1	3/4"	(2)#12	(1)#12
P2	3/4"	(3)#12	(1)#12
P3	3/4"	(2)#10	(1)#10
P4	3/4"	(3)#10	(1)#10
P5	3/4"	(3)#8	(1)#10
P6	3/4"	(4)#8	(1)#10
P7	1"	(3)#6	(1)#8
P8	1"	(4)#6	(1)#8
P9	1 1/4"	(3)#4	(1)#8
P10	1 1/4"	(4)#4	(1)#8
P11	1 1/2"	(3)#3	(1)#6
P12	1 1/2"	(4)#3	(1)#6
P13	1 1/2"	(3)#2	(1)#6
P14	1 1/2"	(4)#2	(1)#6
P15	2"	(3)#1	(1)#6
P16	2"	(4)#1	(1)#6
P17	2"	(3)#1/0	(1)#6
P18	2"	(4)#1/0	(1)#6
P19	2 1/2"	(3)#2/0	(1)#6
P20	2 1/2"	(4)#2/0	(1)#6
P21	2 1/2"	(3)#3/0	(1)#4
P22	2 1/2"	(4)#3/0	(1)#4
P23	3"	(3)#4/0	(1)#4
P24	3"	(4)#4/0	(1)#4
P25	3"	(4)350KCMIL	(1)#1

SIGNAL CABLE/CONDUIT SCHEDULE		
SYMBOL	CONDUIT SIZE	CONDUCTORS
S	1"	VENDER SPECIFIED
S1	3/4"	1-2/C#16 TSP
S13	3/4"	1-3/C#16 TSP
S14	3/4"	1-4/C#16 TSP
S2	3/4"	2-2/C#16 TSP
S23	3/4"	2-3/C#16 TSP
S3	1"	3-2/C#16 TSP
S33	1"	3-3/C#16 TSP
S4	1"	4-2/C#16 TSP
S5	1"	5-2/C#16 TSP
S6	1 1/2"	6-2/C#16 TSP
S7	1 1/2"	7-2/C#16 TSP
S8	1 1/2"	8-2/C#16 TSP
S9	1 1/2"	9-2/C#16 TSP
S10	2"	10-2/C#16 TSP
TC1	3/4"	8/C#18

TELE/DATA CABLE/CONDUIT SCHEDULE		
SYMBOL	CONDUIT SIZE	CONDUCTORS
TD1	1"	1-CAT6 CABLE
TD3	1 1/2"	3-CAT6 CABLE

CONTROL CABLE/CONDUIT SCHEDULE		
SYMBOL	CONDUIT SIZE	CONDUCTORS
C2	3/4"	2#14
C4	3/4"	4#14
C5	3/4"	5#14
C6	3/4"	6#14
C7	3/4"	7#14
C8	3/4"	8#14
C9	3/4"	9#14
C10	3/4"	10#14
C12	3/4"	12#14
C16	1"	16#14
C20	1"	20#14
C30	1"	30#14

NOTE: CONDUIT AND CONDUCTOR SIZES ARE TO BE PER THE ABOVE SCHEDULES UNLESS OTHERWISE NOTED.

PANELBOARD SCHEDULE															
NO. LP1							LOCATION: PUMP ROOM								
208/120 V, 3 PH, 4 W, 100 A MAINS							100 A SOLID NEUTRAL								
10,000 AIC AT 120 V							100 A GROUND BUS								
							100 A MCB								
							-- A MLO SURFACE MOUNTING								
CIRCUIT	DESCRIPTION OF LOAD	LOAD (KVA)			BREAKER		CIRCUIT	DESCRIPTION OF LOAD	LOAD (KVA)			BREAKER		CIRCUIT	
		Aφ	Bφ	Cφ	TRIP	POLE			POLE	TRIP	Aφ	Bφ	Cφ		TRIP
* 1	PUMP ROOM RECEPTACLES	0.60			20	1	1	20	0.60			1	20	2	
* 3	BOILER/STORAGE/BATHROOM RECETPACLES	0.60			20	1	1	20	0.3			1	20	4	
* 5	EXTERIOR RECEPTACLES		0.40		20	1	1	20	0.50			1	20	6	
7	DESK RECEPTACLES	0.80			20	1	1	20	0.50			1	20	8	
9	DESK RECEPTACLES	0.80			20	1	1	20	0.10			1	20	10	
* 11	ROOF LIGHT & RECEPTACLE		0.30		20	1	1	20	0.50			1	20	12	
13	MWRA TELEMTRY PANEL	0.20			20	1	1	20	0.10			1	20	14	
15	EQUIPMENT RACK RECEPTACLE	0.50			20	1	1	20	1.0			1	20	16	
17	MWRA CHART RECORDER UIR-44 Analyzer	0.20	0.20		20	1	1	20	0.70			1	20	18	
19	FRAMINGHAM CHART RECORDER UIR-105	0.20			20	1	1	20	-			1	20	20	
21	SPARE				20	1	1	20	-			1	20	22	
23	SPARE				20	1	1	20	-			1	20	24	
25	SPARE				20	1	1	20	-			1	20	26	
27	SPARE				20	1	1	20	-			1	20	28	
29	SPARE				20	1	1	20	-			1	20	30	
31	SPARE				20	1	1	20	-			1	20	32	
33	SPARE				20	1	1	20	-			1	20	34	
35	SPARE CHW1				20	1	1	20	1.0			1	20	36	
37	EHW-1	4.1			20	1	1	20	0.5			1	20	38	
39	EJECTOR PUMP CONTROL PANEL		1.95		30	2	2	20	1.5			2	20	40	
41			1.95						1.5					42	
SUB-TOTAL CONNECTED		5.9	3.85	2.85					1.7	2.9	4.2				
* PROVIDE GFCI BREAKER															
		SUB-TOTAL CONNECTED			KVA Aφ = 7.6				SUB-TOTAL CONNECTED			KVA Bφ = 6.75			
		SUB-TOTAL CONNECTED			KVA Cφ = 7.05				SUB-TOTAL CONNECTED			KVA = 21.4			
		TOTAL CONNECTED													

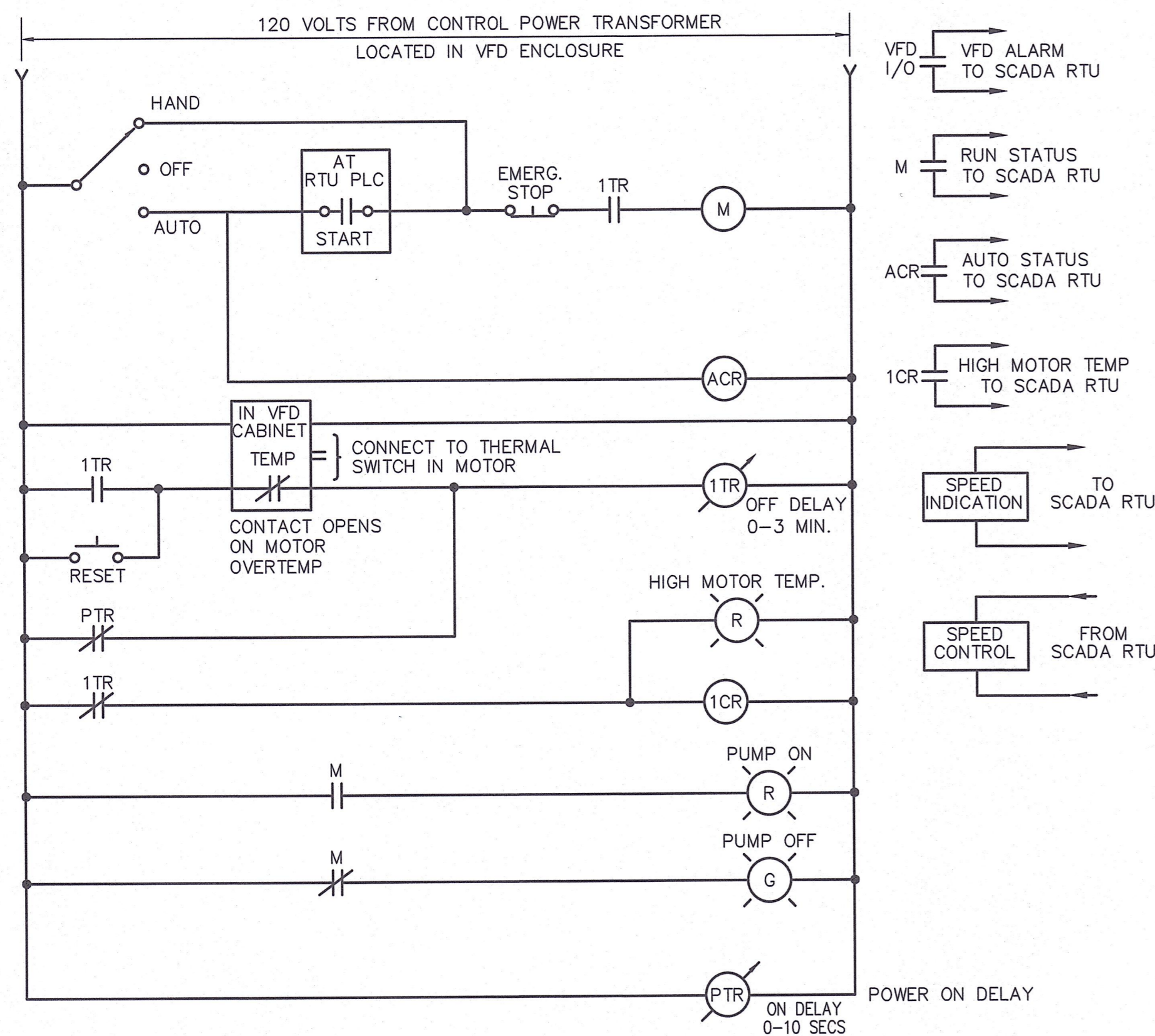
1/24/2020 10:04 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGELL WATER PUMPING STATION\ELECTRICAL DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW.STB)

DRAWN BY: RLB DESIGNED BY: MJC CHECKED BY: MJC	REGISTERED PROFESSIONAL 	PREPARED BY:  www.BETA-inc.com	SUBCONSULTANT  Mechanical/Electrical Engineers 150 Greenman Drive, Suite 305 Braintree, Massachusetts 02184 617-221-9220 www.swr.com	SCALE NONE	TITLE <b>Edgell Road Water Pumping Station Replacement ELECTRICAL SCHEDULES</b>	BETA JOB NO. 6481 ISSUE DATE JANUARY 2020 SHEET NO. E-8
NUMBER DATE MADE BY CHECKED BY REVISIONS						

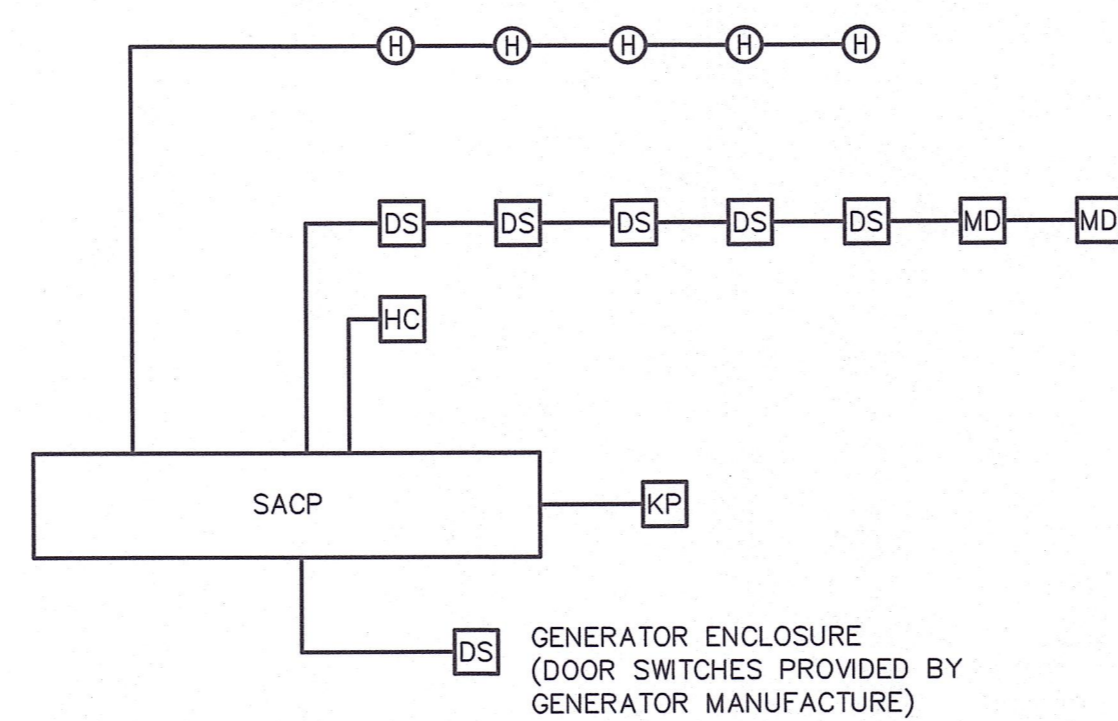
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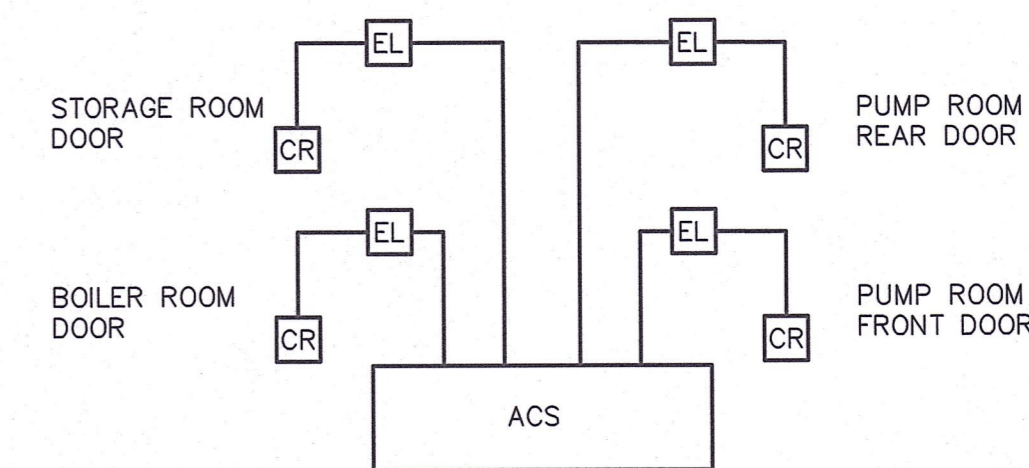
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**CONTROL WIRING DIAGRAM  
BOOSTER PUMPS**  
NOT TO SCALE

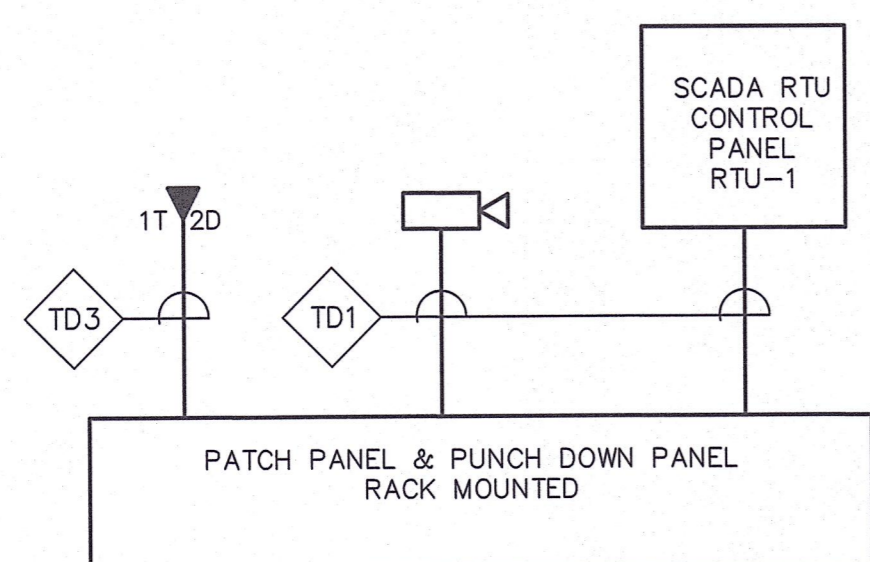


**SECURITY SYSTEM RISER**  
NOT TO SCALE



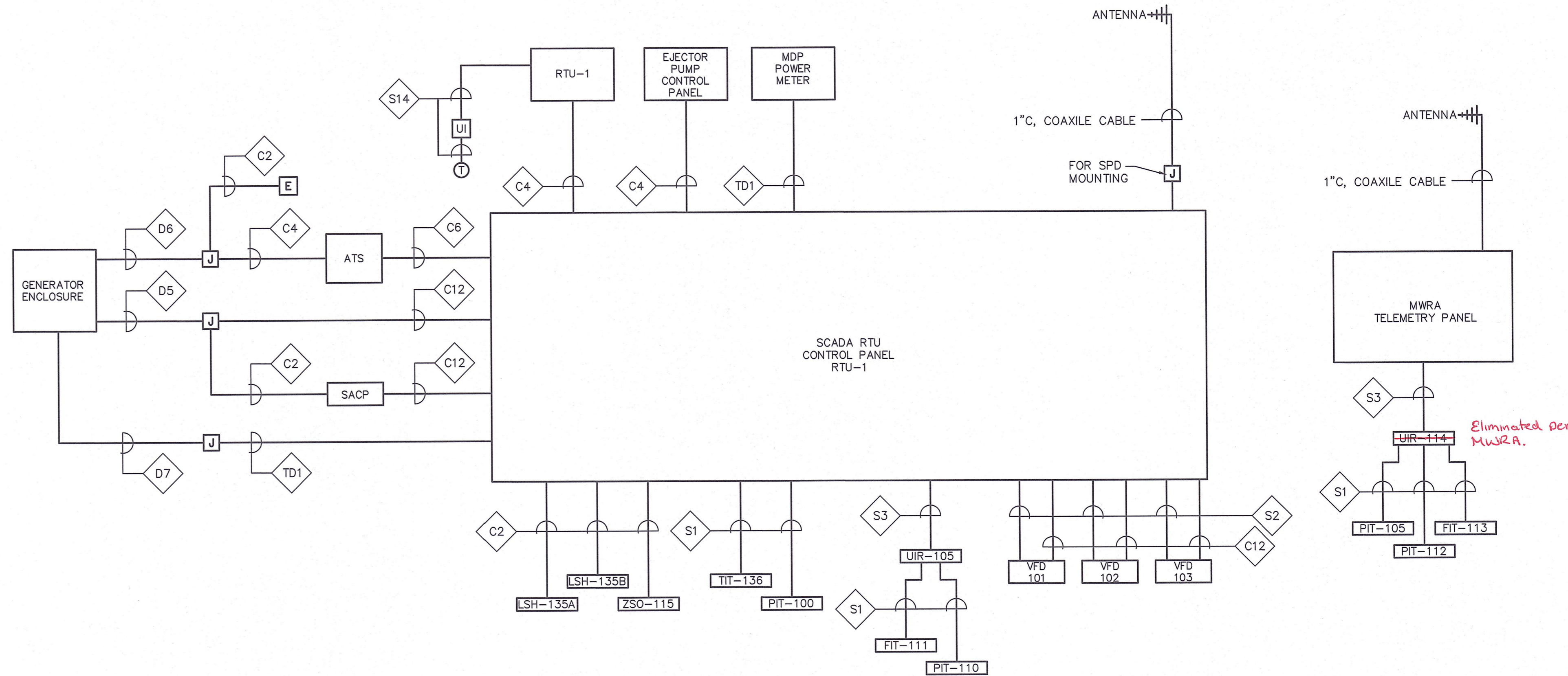
**ACCESS CONTROL SYSTEM EMPTY CONDUIT RISER**  
NOT TO SCALE

- NOTES:
1. PROVIDE 3/4" EMPTY CONDUIT SYSTEM WITH NYLON PULL STRING BETWEEN AND EQUIPMENT AND DEVICE LOCATION. REFER TO LEGEND FOR REQUIREMENTS AT EACH LOCATION.



**COMMUNICATIONS & CCTV RISER DIAGRAM**  
NOT TO SCALE

- NOTES:
1. RISER DIAGRAM ONLY REPRESENTS TYPE OF DEVICES AND DOES NOT REPRESENT ACTUAL QUANTITIES. REFER TO PLAN DRAWINGS QUANTITIES AND LOCATIONS OF DEVICES.



**CONTROL BLOCK WIRING DIAGRAM**  
NOT TO SCALE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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SCALE  
NONE

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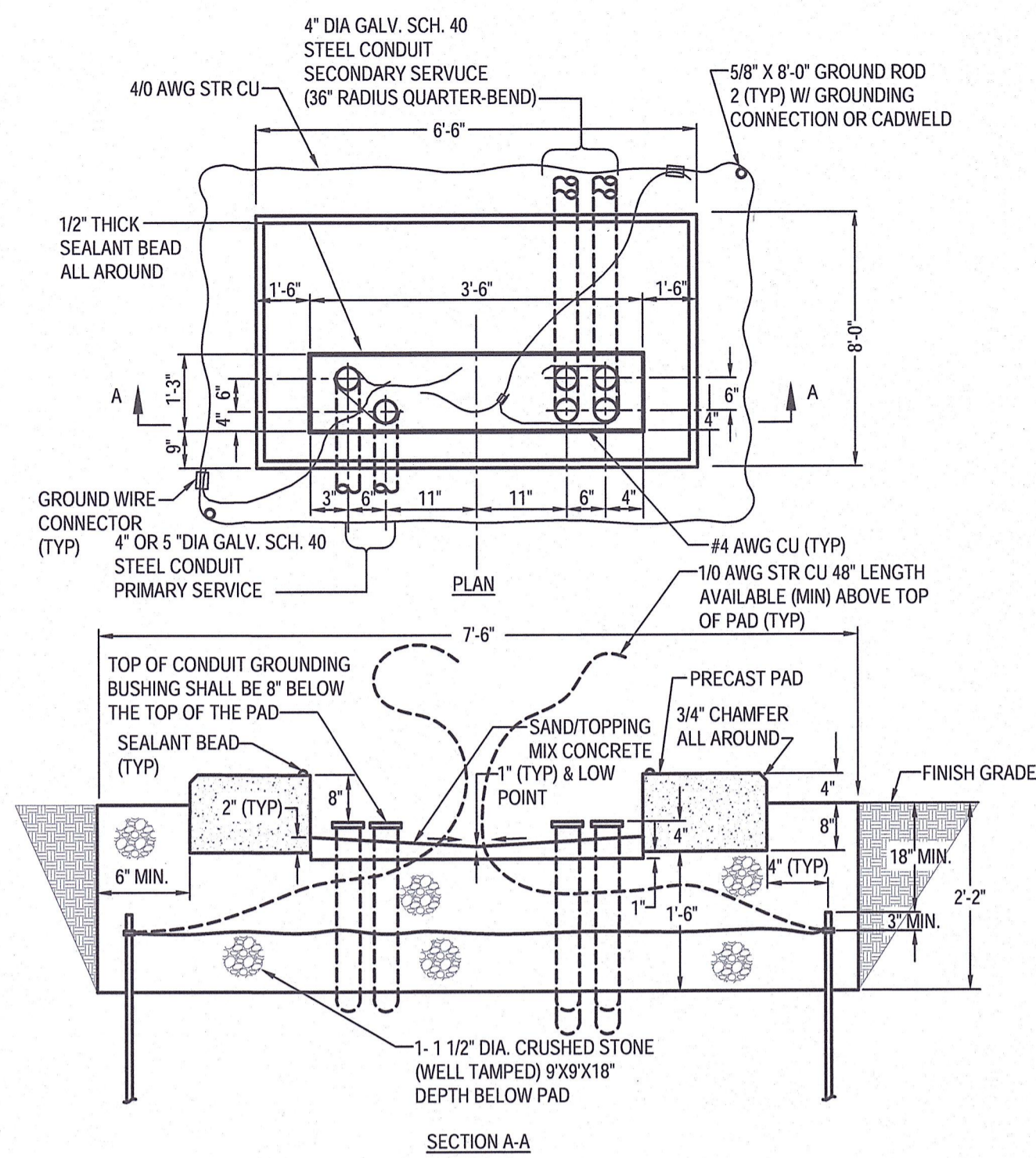
TITLE  
**Edgell Road Water Pumping Station Replacement ELECTRICAL WIRING DIAGRAMS**

BETA JOB NO. 6481

ISSUE DATE JANUARY 2020

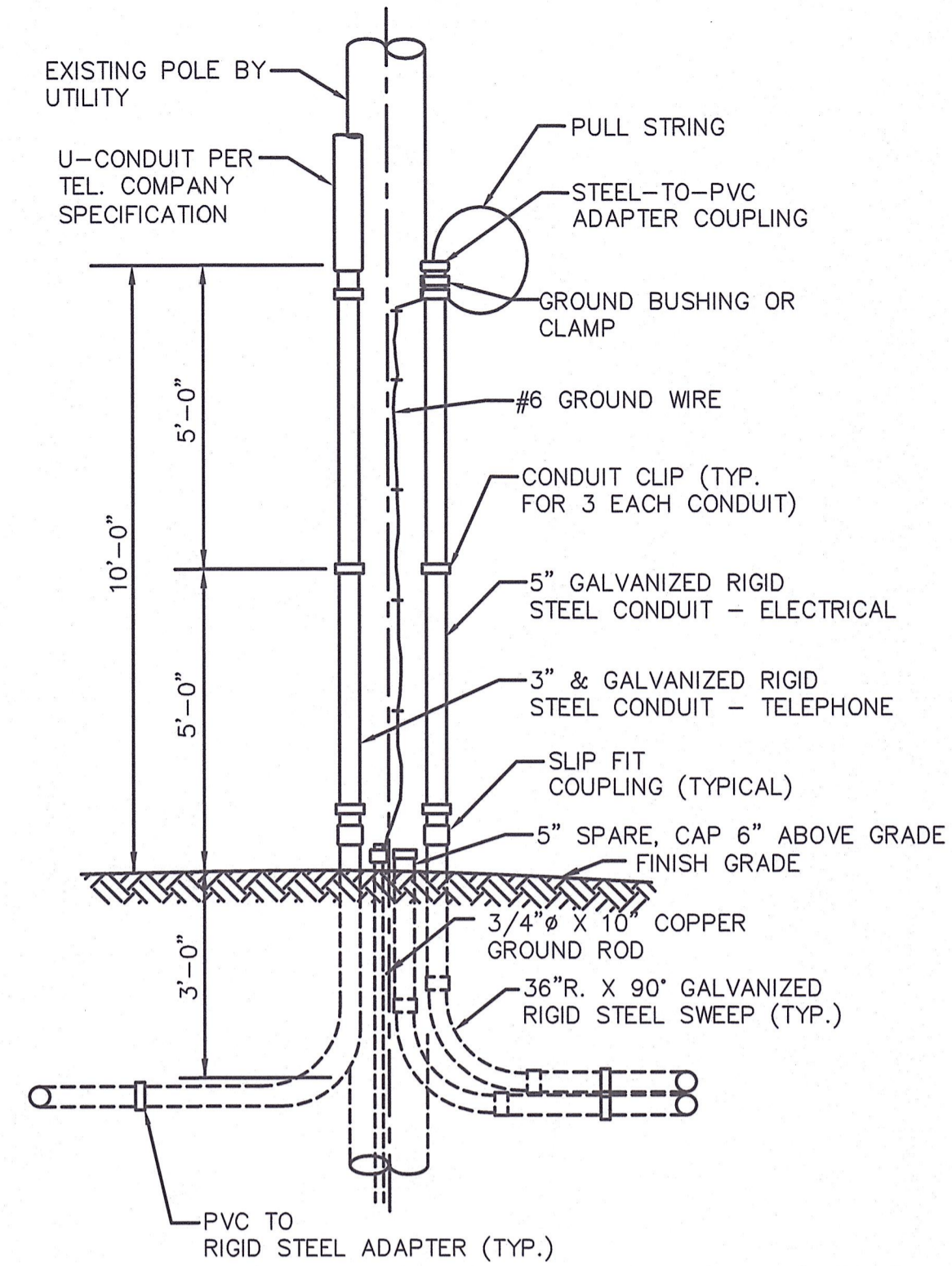
SHEET NO. E-9



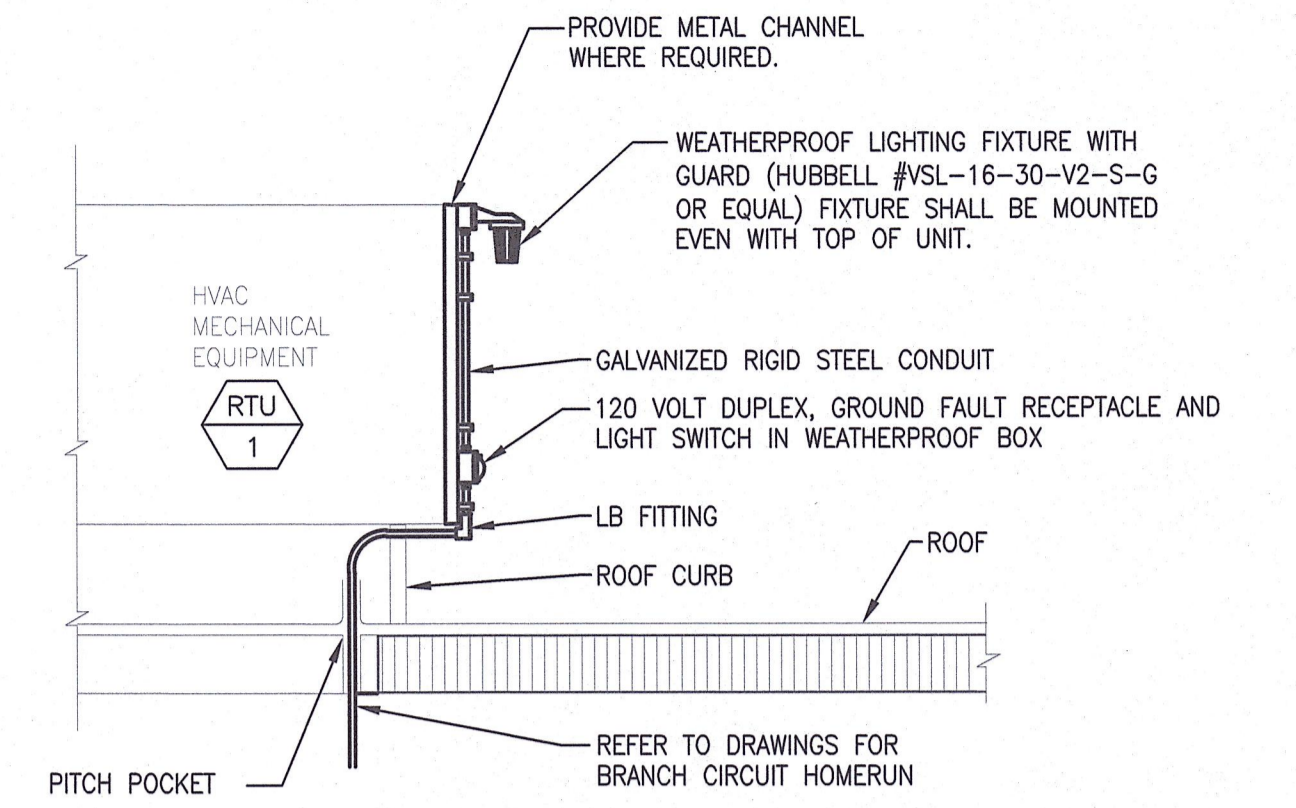


**NOTES:**  
 1. SEAL SECONDARY CONDUITS WITH EXPANDING FOAM AND GROUT PRIMARY AND SECONDARY CONDUIT OPENINGS ON PAD.

**TRANSFORMER PAD**  
 NO SCALE

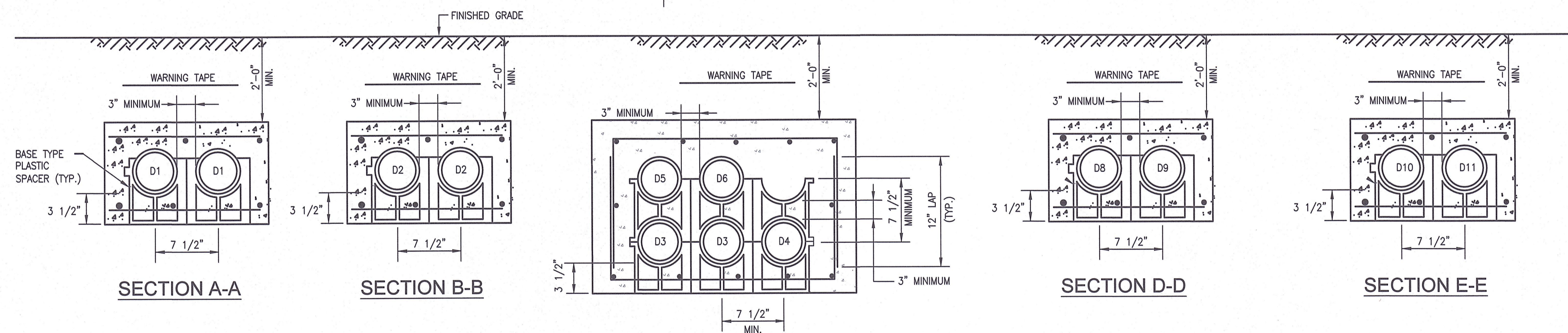


**UTILITY POLE SERVICE RISER DETAIL**  
 NOT TO SCALE



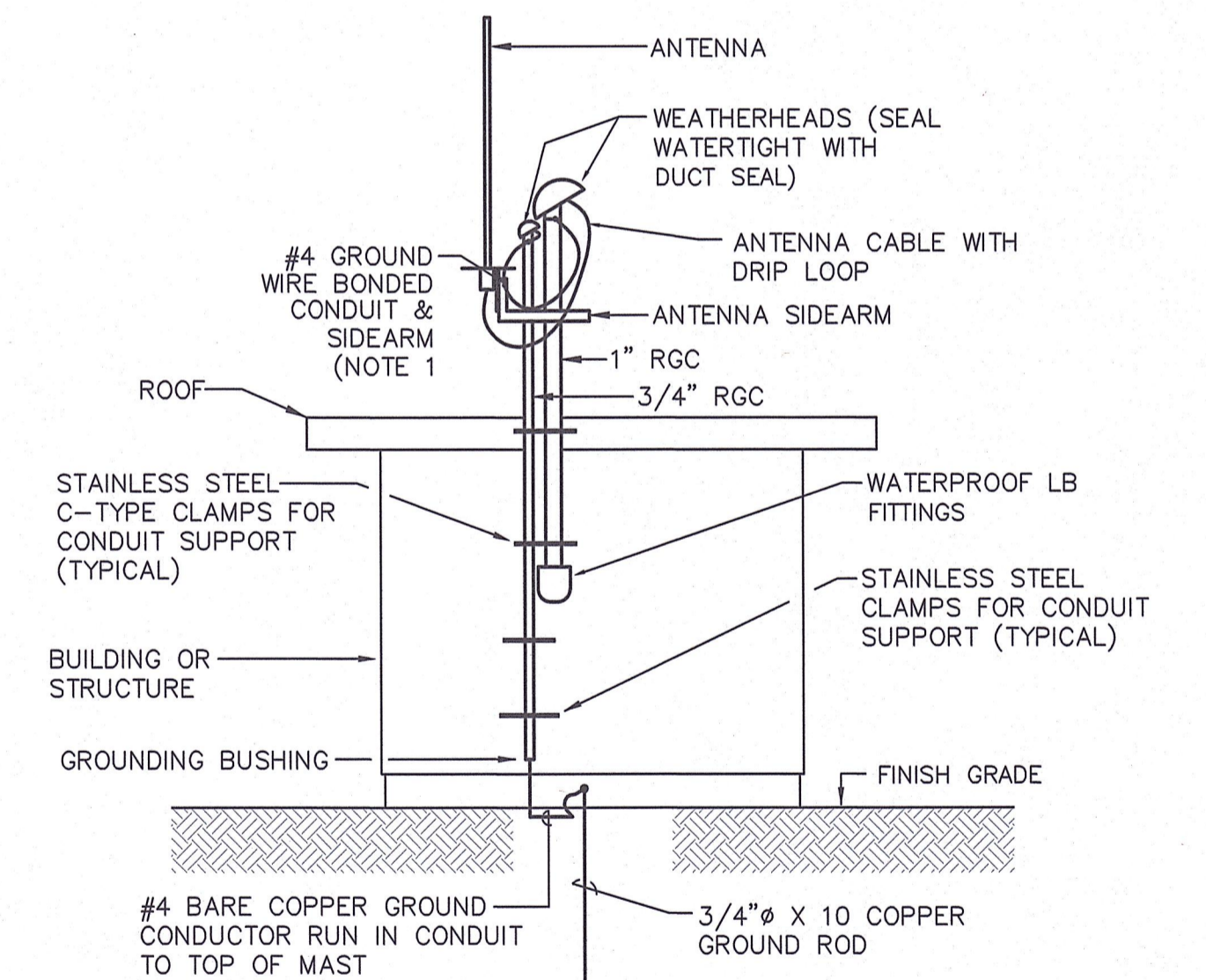
**ROOFTOP LIGHT AND RECEPTACLE DETAIL**  
 NOT TO SCALE

DUCT / CABLE SCHEDULE				
DUCT NO.	SIZE	CONDUCTORS	FROM	TO
D1	5"	PULL STRING FOR PRIMARY SERVICE	UTILITY POLE	UTILITY TRANSFORMER
D2	4"	(4) 350kcmil	UTILITY TRANSFORMER	MCB
D3	4"	(4) 350kcmil, #1 GND	GENERATOR	GENERATOR DISCONNECT SWITCH
D4	1"	(6) #12, #12GND	LP-1	GENERATOR AUXILIARY SYSTEMS.
D5	1"	(20) #14	GENERATOR	SCADA RTU CONTROL PANEL & SECURITY CONTROL PANEL
D6	1"	(6) #14	GENERATOR	ATS & EMERGENCY STOP
D7	1"	(1) CAT6 CABLE	GENERATOR	SCADA RTU CONTROL PANEL
D8	2"	FIBER OPTIC CABLE	UTILITY POLE	EQUIPMENT RACK
D9	2"	PULL STRING FOR TELE/COM	UTILITY POLE	TELE/COM BACKBOARD
D10	2"	MANUFACTURE PUMP CORD	EJECTOR PUMP CONTROL PANEL	EJECTOR PUMP
D11	1"	(2) #12, #12GND	EJECTOR PUMP CONTROL PANEL	EJECTOR PUMP MANHOLE SOLENOID



**NOTES:**  
 1. BACKFILL DUCT BANK IN LAYERS AND MANUALLY TAMP OR "PUDDLE" CONCRETE FILL. PROVIDE RED DUCT BANK MARKER TAPES, READING "CAUTION - ELECTRICAL LINES BELOW", OVER ENTIRE LENGTH OF DUCTLINE. LOCATE TAPES 12 INCHES BELOW GRADE. PROVIDE A TAPE FOR EVERY 12 INCHES OF WIDTH OF DUCTLINE.  
 2. A MINIMUM OF 12" SEPARATION SHALL BE KEPT BETWEEN DUCT BANK SECTIONS WITHIN SAME TRENCH.

**DUCTBANK SECTIONS**  
 NO SCALE



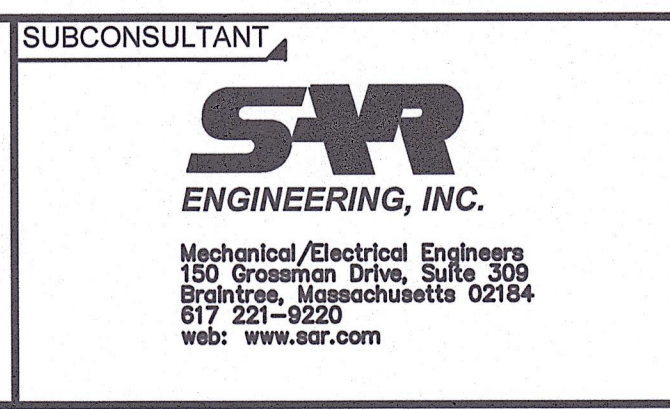
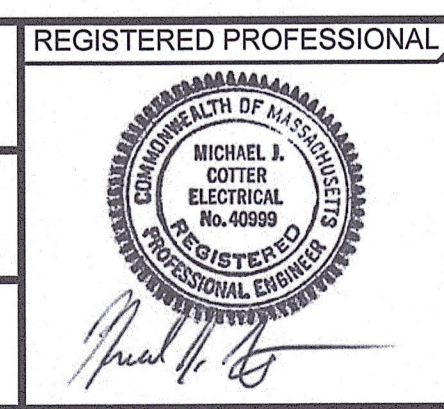
**ANTENNA BUILDING MOUNTING DETAIL**  
 NOT TO SCALE

**NOTES:**  
 1. BOND ANTENNA MAST AND ANTENNA GROUNDING SYSTEM TO RTU AND ANTENNA CABLE AS WELL AS SERVICE FEEDER FOR COMMON GROUNDING SYSTEM POINT.

1/24/2020 10:05 AM W:\YEAR - 2018\18004.00 - FRAMINGHAM EDGELL WATER PUMPING STATION\ELECTRICAL\DEPARTMENT\18004.00 ELEC.DWG (BETA STB BW STB)

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MJC



SCALE: NONE  
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TITLE: **Edgell Road Water Pumping Station Replacement ELECTRICAL DETAILS**

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