Humboldt Bay Municipal Water District
12 kV Switchgear Relocation Project
Bid Addendum #1

The purpose of this Addendum is to modify the Contract Documents for the subject project. This Addendum shall become part of said Contract Documents.

Bidders shall acknowledge receipt of this Addendum in their bid proposal.

This Addendum addresses the following items and questions:

1. The pre-bid meeting sign-in sheet has been attached to this addendum.
2. Section 1.01.C of Specification 01 11 00 shall be updated to state the following:

   "The District has submitted an application for service relocation to PG&E's Building Renovation Department. An additional required application to PG&E's Electric Generation Interconnection department will be submitted by the District upon Contractor selection. The Contractor shall comply with all PG&E interconnection requirements, coordinate with the utility for development and all required interconnection services, and said requirements shall become part of the Contract Documents. The District shall pay all fees associated with PG&E facility upgrades and service interconnection."

   Any other references in the Contract Documents to the Contractor paying PG&E fees shall be revised to state that the District will be paying all fees associated with PG&E facility upgrades and service interconnection.
3. The Bid Schedule will not be revised. Grant requirements dictate that the Bid Schedule be broken into separate component costs as was previously provided. Please provide line item costs for each component as listed in the Bid Schedule.
4. Are the existing high-voltage lines encased in concrete?
   i) Sheet E-601 shows the existing single line diagram with some concrete encased lines identified. No potholing was performed to confirm the accuracy of the existing single line diagram or locations where the high voltage lines are encased.
5. Are all of the vaults for the project supposed to be traffic-rated?
   i) Yes.
6. Is Cummins West going to do all the generator interconnects? Who is responsible for coordination between the generator and protective relays?
   i) Cummins West will not be doing all of the generator interconnects. All of the landing points are in the drawings, and there is nothing new. Contractor is responsible for connecting, testing, commissioning, and coordinating relays to the satisfaction of PG&E and the Owner.

7. The Contractor is responsible for checking road capacities, overhead lines, etc and figuring out how to get the integrated power assembly (IPA) delivered to the site. The switchgear and IPA may come as one assembly that is approximately 46 feet long, 15 feet wide, 12.5 feet high, and weighs approximately 68,000 pounds (exact dimensions and weight to be provided by switchgear/IPA manufacturer).

8. Are there any special stormwater considerations?

    i) There is no SWPPP or NPDES permit required for this project. Standard best management practices will be provided by the Contractor to prevent erosion, sediment-laden water from entering waterways, and to promote site stabilization and revegetation upon project completion.

9. Will there be two separate PG&E services at one time?

    i) The second service will be installed for the new switchgear while the existing service is still powering the existing switchgear. The existing service will be demolished after the switchover.

10. Will you provide an Engineer's estimate for bonding purposes?

    i) Engineer's Opinion of Probable Construction Cost for this project is $2,200,000.

11. Will payment be provided for materials on-hand?

    i) Many of the items are being measured and paid for on a percent complete basis, as described in Specification 01 22 00. If the Contractor can document that they have high-cost materials on-hand, then this can be considered as a percentage complete and can be reimbursed accordingly by the District.

12. Is the switchgear design sole source?

    i) No, input was solicited from multiple switchgear manufacturers during the design process. The intent is that the design of the slab and other components is sufficient to accommodate an integrated power assembly and switchgear equipment from any major manufacturer.

13. Section 2.02.A of Specification 26 13 26 notes that the switchgear shall be suitable for an ungrounded system. Additionally, there is no ground wire shown in the conduit schedule on Sheet E-604. The high-voltage feeders are not showing a ground in the new conduit. Is the intent for the switchgear system to be ungrounded?

    i) PG&E's electrical system is 3-phase, 3-wire, ungrounded. The switchgear itself must be grounded. The switchgear ground bus shall be grounded to the existing and new grounding rods and system as shown on the plans (see the attached revised Sheet E-102) and tested per the Specifications. The intent is for a ground wire to be included in the new duct bank and bonded to ground rods, manhole, switchgear, and existing grounding systems. Metal parts and splices in the new vaults shall be bonded to ground.

14. Is there a ground for the existing high-voltage system?

    i) It is thought that there is an existing #2/0 ground wire in the existing feeder duct bank, and the existing grounding system with connections to existing switchgear is shown on the plans.

15. The plans show conuctors between the 1200 A tie breakers rather than having it bussed. Why?

    i) Bussing between the 1200 A tie breakers is the preferred method of interconnection. Conductors were shown on the plans to provide greater flexibility to equipment manufacturers for bus alignment of switchgear components.

16. What is the cable connection between SEL protective relays between the bus tie relays?

    i) The cable connection between SEL protective relays is the potential bus. This is shown on the attached revised E-602.

17. Is the existing switchgear to remain or be removed?

    i) The existing switchgear will become the property of the contractor and is to be removed and properly disposed of by the contractor.

18. How is the sequencing of the generator and utility switchover conceptualized?

    i) The District will work with the selected contractor on determining sequencing and the feasibility of running one half of the system on the generator while the other half is being switched over. The contractor is ultimately responsible for developing the switchover schedule and coordinating with PG&E.

19. The existing overhead service will make it difficult to set the IPA on the new slab. It is possible to turn off the power and take down this overhead line to allow for setting the IPA. This will take coordination with PG&E, which will be the contractor's responsibility.

20. Contractors shall note that the IPA shop drawings need to be reviewed and approved by PG&E. This coordination is the contractor's responsibility.

21. The schedules on Sheet E-604 are blurry. A revised E-604 with clearer schedules has been attached to this addendum.

22. Drawing S-501, Detail 6 shows the new retaining wall. Is the intent to form and place this monolithic, or may it be constructed and placed in two separate concrete pours?

    i) Multiple pours may be used for the concrete walkway and retaining wall.

23. Will waterproofing be required on the back side of the concrete retaining wall?

    i) No.

24. What is the intended finish on the exposed face of the retaining wall?

    i) A brushed or smooth-troweled finish.

25. What shall be the finish of the new handrail?

    i) Hot-dip galvanized.

26. Sheet C-101 indicates the existing DI at the west side of the project (Sheet Keynote #7), and it appears that there is not an existing grate at this location. Is the Contractor to include furnishing and placement of a new grate for this item?

i) The existing structure called out by Keynote #7 on Sheet C-101 is a storm drain manhole and does not currently have a grate. It is not intended that a new grate shall be furnished and placed at this location. The new drain lines will tie in to this existing storm drain manhole. A separate new DI and grate will be installed as shown by Keynote 2 on Sheet C-101.

27. Specification 03 30 00 (Cast-in-place Concrete) Section 3.09 states that the Contractor is to hire an independent materials tester to perform field inspection and testing. Can you confirm that the Contractor is to include a special inspector as a part of the Contractor's scope of work?

    i) The Contractor is responsible for hiring an independent materials tester to perform the testing as outlined in Section 3.09 of Specification 03 30 00.

28. Sheet C-101, Keynote 4 states "(E) switchgear facilities to be demolished per Sheet ED-101." This shall be replaced with "(E) switchgear facilities to be demolished per Sheet E-101", as shown in the attached revised C-101.

29. Specification 01 22 00 (Measurement and Payment), Item 20 notes that the existing switchgear lean-to cover structure is to remain in place. Keynote 2 on Sheet E-101 notes that the switchgear enclosure shall be demolished. Is the switchgear enclosure to remain or be demolished?

    i) The switchgear enclosure shall be demolished, removed, and properly disposed of by the Contractor.

Enclosed:

- Pre-bid Meeting Sign-in Sheet
- Revised Sheet C-101
- Revised Sheet E-102
- Revised Sheet E-602
- Revised Sheet E-604

END OF ADDENDUM

11/26/19
Date

Signature

GHD Project #: 11186675

Humboldt Bay Municipal Water District
12 kV Switchgear Relocation Project
Pre-Bid Meeting Sign-In Sheet

Date: November 21, 2019
Location: HBMWD Essex Office

Name	Company/Affiliation	Phone	Email
Nathan Stevens	GHD	707-443-8326	nathan.stevens@ghd.com
Dave Sanderson	Eaton	541-776-4849	DavidmSanderson@eaton.com
Kyle Brown	R.E.S	707-499-8283	Kyle@RedwoodElectrical.Servic
BRIAN PRITCHARD	SEQUOIA CONST.	707-442-3596	BRIAN@SEQUOIACONST.COM
Richard Andersen	Colburn Electric	707-498-9230	
Robert Colburn	" "	445-8474	Office@Colburns-Electric.com
CHRIS ZARBACK	PIERSON COMPANY	707-499-9942	CHRIS.Z@PIERSONCOMPANY.COM
Casey Poff	GR Sundberg, INC	707-825-6565	grs@grsinc.biz
MARK BENZINGER	MEYER FRANK CO.	443-6371	mBenzinger@meyerfrank.com
Jeff Heston	Cummins	826-8861	JEFF.S.Heston@Cummins.com
Gaurav Kumar	McKeever Energy	822-0100	gaurav@mckeeverenergy.com

SHEET GENERAL NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH THE DISTRICT AT LEAST TWO (2) WEEKS PRIOR TO ANY CONSTRUCTION ACTIVITIES SO THAT THE DISTRICT-SUPPLIED BIOLOGIST CAN CONDUCT NESTING BIRD AND BIOLOGICAL SURVEYS.
2. THE CONTRACTOR SHALL PROVIDE TRENCH PLATE/BRIDGING TO CROSS EXISTING BURIED UTILITIES WITH EQUIPMENT.
3. EXISTING UTILITIES AND STRUCTURES LOCATED WITHIN THE PROJECT LIMITS ARE TO REMAIN AND BE PROTECTED.
4. LOCATIONS OF EXISTING UTILITIES AND STRUCTURES ARE FROM THE BEST INFORMATION AVAILABLE. EXACT LOCATION AND COMPLETENESS ARE NOT GUARANTEED. CONTRACTOR TO POTHOLE FOR EXACT LOCATIONS. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICES ALERT A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION. NOTE THAT THIS DRAWING DOES NOT SHOW ALL UTILITIES PRESENT OR PROPOSED, SEE ELECTRICAL DRAWINGS FOR MORE INFORMATION.
5. THE DRAINAGE DITCH ON THE SOUTH SIDE OF THE RAILROAD GRADE IS A PALUSTRINE EMERGENT WETLAND AND SHALL REMAIN UNDISTURBED. A SILT FENCE SHALL BE INSTALLED ALONG THE LENGTH OF THE DITCH, APPRX 185 LF.
6. CONTRACTOR IS RESPONSIBLE FOR PERFORMING ANY REQUIRED BRUSH CLEARING, TREE REMOVAL, AND LIMB REMOVAL PRIOR TO THE BEGINNING OF THE AVIAN NESTING SEASON ON MARCH 15.
7. CONTRACTOR SHALL STRIP OFF ALL TOPSOIL PRIOR TO OTHER DISTURBANCE, STOCKPILE ONSITE, AND REPLACE ON DISTURBED AREAS UPON PROJECT COMPLETION.

SHEET KEYNOTES

1. CONNECT (N) FENCE TO (E) FENCE. REMOVE (E) FENCE TO THE NORTHEAST. (E) REMOVED FENCE SHALL BE PROPERTY OF OWNER AND SHALL BE STOCKPILED ONSITE FOR REMOVAL BY OWNER.
2. (N) 12" L x 12" W x 24" H DROP INLET WITH H-20 TRAFFIC RATED GRATE AND FRAME, JENSEN 1212-HDI OR APPROVED EQUAL.
3. (N) SELF-FORMING TRENCH PAN TRENCH DRAIN, NEENAH R-4996-A OR APPROVED EQUAL. 8" TOP WIDTH WITH 6" OUTLET AND TYPE C GRATE. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
4. (E) SWITCHGEAR FACILITIES TO BE DEMOLISHED PER SHEET E-101 (2)
5. (N) CONCRETE SLAB, 5" THICK WITH #4 REBAR AT 12" OC EACH WAY.
6. (N) 6" PVC PIPE FOR DRAINAGE, CONTRACTOR TO PROVIDE FITTINGS AS REQUIRED. INSTALL PER DETAIL 4, SHEET C-501. FRENCH DRAIN AND SOUTHERN TRENCH DRAIN TO BE CONNECTED TO (N) DI. (N) DI AND NORTHERN TRENCH DRAIN TO BE CONNECTED TO (E) STORM DRAIN MANHOLE. CORE OPENINGS INTO (N) DROP INLET AND (E) MANHOLE AND GROUT ANNULAR SPACE WITH NON-SHRINK GROUT. (N) PIPES TO HAVE 2% SLOPE MIN.
7. (E) STORM DRAIN MANHOLE.

POINT TABLE		
POINT #	EASTINGS	NORTHINGS
1	1432369.22	579845.63
2	1432380.94	579850.84
3	1432407.06	579851.30
4	1432412.06	579851.39
5	1432407.15	579846.30
6	1432412,15	579846.39
7	1432444.05	579851.95
8	1432449.05	579852.04
9	1432444.14	579846.95
10	1432449.14	579847.04
11	1432481.92	579852.62
12	1432491.21	579852.79
13	1432482.01	579847.62
14	1432491,30	579847.79
15	1432459.97	579833.01
16	1432466.57	579831.38
17	1432485,63	579888.64
18	1432504.68	579834.18
19	1432506.88	579822.38
20	1432469.12	579815.83
21	1432455.26	579813.89
22	1432398.39	579810.03
23	1432396.99	579830.65
24	1432453.86	579834.51
25	1432401,76	579815.77
26	1432400.70	579831.41
27	1432447.09	579834.55
28	1432448,15	579818.92

No.	Issue	Drawn	Approved	Date
2	ADDENDUM #1	N.S.	P.K.	11/26/2019
1	ISSUE FOR BID	N.S.	P.K.	11/5/2019

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Project Manager	P. KASPARI	Date	11/26/2019
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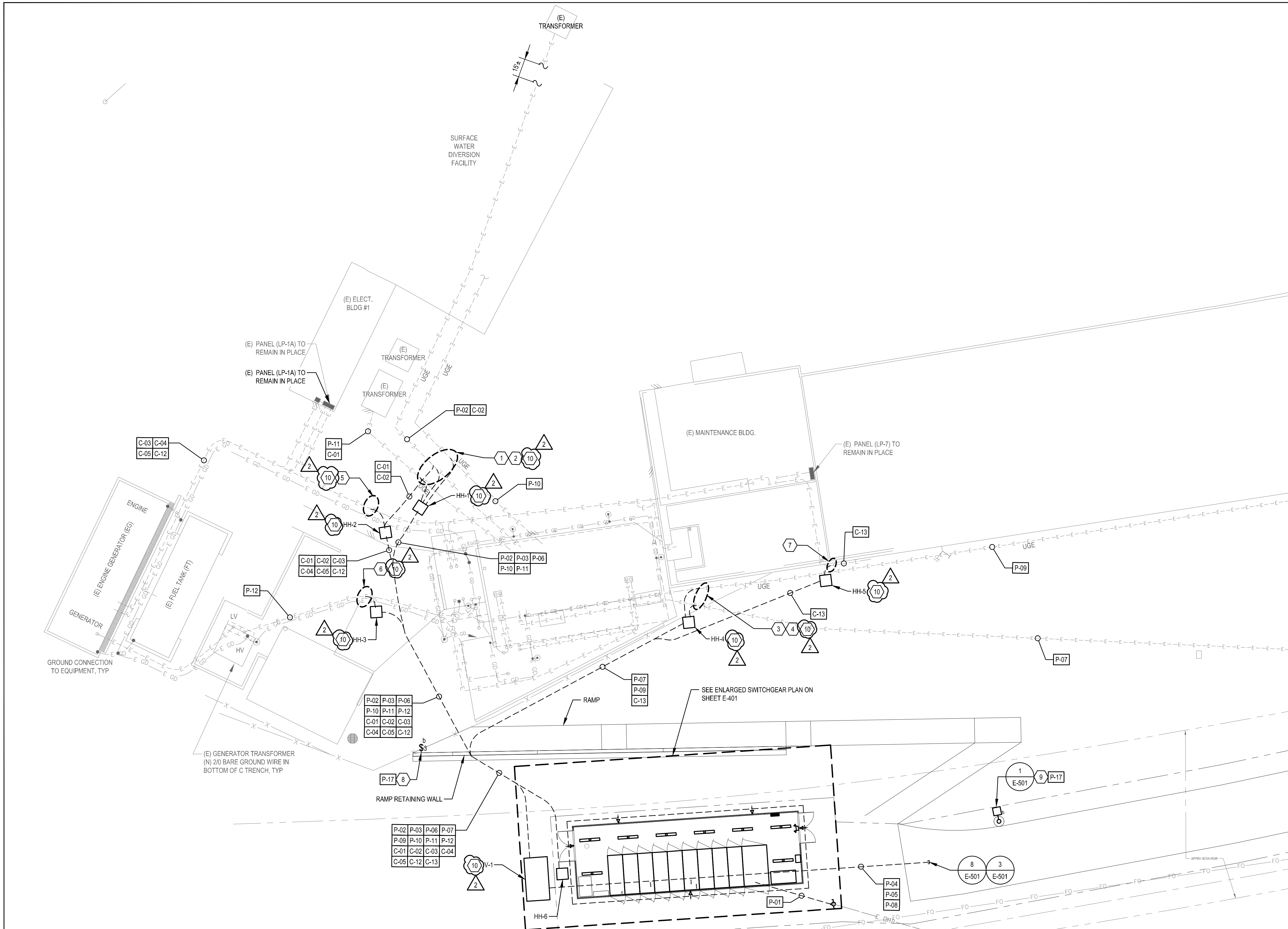
Client HUMBOLDT BAY MUNICIPAL WATER DISTRICT
Project 12 kV SWITCHGEAR RELOCATION
Title CIVIL SITE PLAN
Project No. 11186675
Original Size ANSI D
Sheet No. C-101
Sheet 3 of 24

Plot Date: 26 November 2019 - 11:52 AM Plotted By: Nathan Stevens
Filename: N:\US\Eureka\Projects\111\11186675 HBMWD-12kV Switchgear Replacement\06-CAD\Sheets\11186675_03_C101_CivilSite.dwg



SHEET GENERAL NOTES

1. REROUTE & EXTEND CONDUITS IN NEW TRENCH (SEE TRENCH DETAILS ON SHEET E-501 AND CONDUIT AND CABLE SCHEDULE ON SHEET E-604).
2. PROVIDE ELECTRICAL VAULTS 102" X 54" X 72" DEEP. VERIFY IN FIELD THAT ADEQUATE SPACE IS AVAILABLE FOR INSTALLATION.
3. PROVIDE COMMUNICATION VAULTS 48" X 30" X 36" DEEP. VERIFY IN FIELD THAT ADEQUATE SPACE IS AVAILABLE FOR INSTALLATION.
4. REMOVE ALL CABLES ABANDONED BY THIS PROJECT. REMOVE ABANDONED 15KV JUNCTIONS. REMOVE ABOVE-GROUND POWERGLAS ENCLOSURE.
5. ALL EXISTING PAVED AREAS THAT ARE REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE RE-PAVED TO MATCH EXISTING CONDITIONS PER DETAIL 4, SHEET C-501.

SHEET KEYNOTES

1. LOCATE CONDUIT FOR (E) FEEDER #1. PULL (E) CABLES BACK FROM (E) SWITCHGEAR, REROUTE CONDUIT TO NEW VAULT HH-1, AND EXTEND (E) CABLES THROUGH NEW CONDUIT TO HH-1. CUT (E) CABLES TO WORKABLE LENGTH, AND SPLICE TO NEW CABLES TO (N) SWITCHGEAR.
2. REMOVE CABLES FOR FEEDERS #3 & #7 FROM LOAD TO (E) SWITCHGEAR. INSTALL NEW VAULT. INTERCEPT CONDUITS AND REROUTE TO VAULT. PROVIDE CABLES FROM (E) LOAD TO (N) SWITCHGEAR.
3. LOCATE CONDUIT FOR (E) FEEDER #5. PULL (E) CABLES BACK FROM (E) SWITCHGEAR, REROUTE CONDUIT TO NEW VAULT HH-4, AND EXTEND (E) CABLES THROUGH NEW CONDUIT TO HH-4. CUT (E) CABLES TO WORKABLE LENGTH, AND SPLICE TO NEW CABLES TO (N) SWITCHGEAR.
4. REMOVE CABLES FOR FEEDER #4 FROM LOAD TO (E) SWITCHGEAR. INSTALL NEW VAULT. INTERCEPT CONDUIT AND REROUTE TO VAULT. PROVIDE CABLES FROM (E) LOAD TO (N) SWITCHGEAR.
5. INTERCEPT CONTROL TO GENERATOR CONDUITS: SEE CONDUIT SCHEDULE. INSTALL NEW VAULT. REROUTE & EXTEND TO (N) SWITCHGEAR.
6. INTERCEPT GENERATOR FEEDERS TO (E) SWITCHGEAR. INSTALL VAULT, REROUTE & EXTEND CONDUITS TO (N) SWITCHGEAR. PROVIDE NEW CABLES FROM GENERATOR STEP-UP TRANSFORMER TO (N) SWITCHGEAR.
7. INTERCEPT CONTROL CONDUIT, INSTALL BOX AND EXTEND TO RELOCATED HUMGEN DATA INTERFACE PANEL IN SWITCHGEAR ENCLOSURE. SEE NETWORK DIAGRAM FOR NETWORK CABLING.
8. PROVIDE LIGHT SWITCH, 3-WAY, MOUNTING HEIGHT, +44" AFG. MOUNT ON RAMP RETAINING WALL.
9. PROVIDE LED AREA LIGHT, CREE XSPMD SERIES, MOUNTING HEIGHT 10-FT AFG.
10. (2) PROVIDE GROUND ROD IN EACH NEW VAULT. CONNECT DUCT BANK GROUND WIRE TO GROUND ROD. BOND METAL PARTS IN VAULT. PROVIDE SHIELD GROUNDS FOR SPLICES AND BOND TO GROUND ROD.

No.	Issue	Drawn	Approved	Date
2	ADDENDUM #1	N.S.	P.K.	11/26/2019
1	ISSUE FOR BID	S.D.	P.K.	11/5/2019

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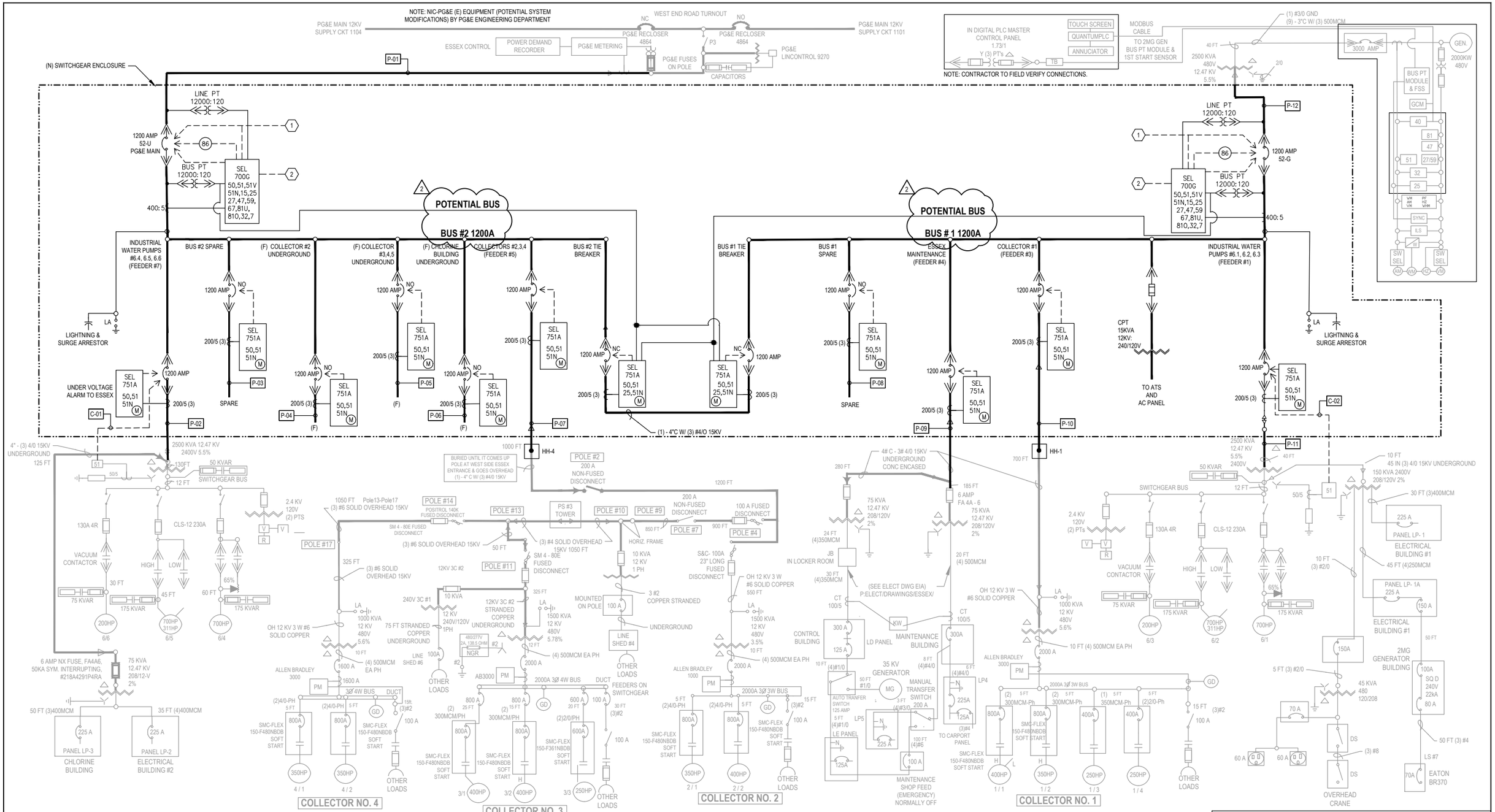
Client **HUMBOLDT BAY MUNICIPAL WATER DISTRICT**
Project **12 kV SWITCHGEAR RELOCATION**
Title **ELECTRICAL SITE PLAN**

Project No. 11186675
Original Size ANSI D
Sheet No. **E-102**
Sheet 11 of 24



SHEET KEYNOTES

1. TRIP/CLOSE SIGNAL FROM CUMMINS PARALLELING CONTROLLER.
2. NETWORK CONNECTION FOR METERING/MONITORING, INCLUDING UNDER VOLTAGE ALARM TO ESSEX

No.	Issue	Drawn	Approved	Date
2	ADDENDUM #1	N.S.	P.K.	11/26/2019
1	ISSUE FOR BID	S.D.	P.K.	11/5/2019

HUMBOLDT BAY MUNICIPAL WATER DISTRICT

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STATE OF CALIFORNIA PROFESSIONAL ENGINEER No. E15580 Exp. 12/31/19 ELECTRICAL

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Drafting Check	N. STEVENS	Design Check	P. KASPARI
Project Manager	P. KASPARI	Date	11/26/2019
		Scale	NONE

Client HUMBOLDT BAY MUNICIPAL WATER DISTRICT
Project 12 kV SWITCHGEAR RELOCATION
Title SINGLE LINE DIAGRAM - NEW
Project No. 11186675
Original Size ANSI D
Sheet No. E-602
Sheet 16 of 24

Plot Date: 26 November 2019 - 12:10 PM
Plotted By: Nathan Stevens
Filename: N:\US\Eureka\Projects\111\11186675 HBMWD-12kV Switchgear Replacement\06-CAD\Sheets\11186675_16_E602_OneLineNew.dwg

CONDUIT AND CABLE SCHEDULE

CKT#	DESCRIPTION	FROM	TO	CONDUIT SIZE	CABLE SIZE	REMARKS
P-01	PG&E 12 KV SERVICE	PG&E RISER POLE	PCC SWITCHGEAR: COMPARTMENT 1	6"	BY PG&E	
P-02	12 KV FEEDER: INDUSTRIAL WATER PUMPS 6.4, 6.5, 6.6	SWITCHGEAR: COMPARTMENT 3	(E) TRANSFORMER 2	4"	(3) #4/0 AWG CU 15KV	
P-03	SPARE: BUS #2	SWITCHGEAR: COMPARTMENT 3	VAULT HH-1	4"	PULL STRING ONLY	
P-04	12 KV FEEDER: FUTURE COLLECTOR 2 UNDERGROUND	SWITCHGEAR: COMPARTMENT 4	VAULT V-1	4"	PULL STRING ONLY	CONDUIT FOR FUTURE/SPARE
P-05	12 KV FEEDER: FUTURE COLLECTOR 3, 4, 5 UNDERGROUND	SWITCHGEAR: COMPARTMENT 4	VAULT V-1	4"	PULL STRING ONLY	CONDUIT FOR FUTURE/SPARE
P-06	12 KV FEEDER: FUTURE CHLORINE BUILDING	SWITCHGEAR: COMPARTMENT 5	VAULT HH-1	4"	PULL STRING ONLY	
P-07	12 KV FEEDER: COLLECTOR 2, 3, 4	SWITCHGEAR: COMPARTMENT 5	COLLECTOR 2,3,4: POLE #2	4"	(3) #4/0 AWG CU 15KV	
P-08	SPARE: BUS #1	SWITCHGEAR: COMPARTMENT 8	VAULT V-1	4"	PULL STRING ONLY	CONDUIT FOR FUTURE/SPARE
P-09	12 KV FEEDER: ESSEX MAINTENANCE BUILDING	SWITCHGEAR: COMPARTMENT 8	MAINT BLDG. FUSE/XFMR	4"	(3) #4/0 AWG CU 15KV	
P-10	12 KV FEEDER: COLLECTOR 1	SWITCHGEAR: COMPARTMENT 9	COLLECTOR 1: OH/XFMR	4"	(3) #4/0 AWG CU 15KV	
P-11	12 KV FEEDER: INDUSTRIAL WATER PUMPS 6.1, 6.2, 6.3	SWITCHGEAR: COMPARTMENT 9	(E) TRANSFORMER 1	4"	(3) #4/0 AWG CU 15KV	
P-12	GENERATOR FEEDER	GENERATOR XFMR	SWITCHGEAR: COMPARTMENT 10	4"	(3) #4/0 AWG CU 15KV	
P-13	SYNCHRONIZING PANEL AUX POWER	SWITCHGEAR AC PANEL	ONAN MASTER CONTROL	1"	(2) #12 AWG, (1) #12 GND	
P-14	DAT A INTERFACE PANEL CONTROL POWER	SWITCHGEAR AC PANEL	DAT A INTERFACE PANEL	1-1/4"	(2) #12 AWG, (1) #12 GND	
P-15	SWITCHGEAR BATTERY CHARGER AC POWER	SWITCHGEAR AC PANEL	BATTERY CHARGER	3/4"	(2) #12 AWG, (1) #12 GND	
P-16	SWITCHGEAR BATTERY DC POWER	SWITCHGEAR BATTERY	SWITCHGEAR	1"	(2) #10 AWG	
P-17	EXTERIOR AREA LIGHT	SWITCHGEAR AC PANEL	RAMP LIGHT	1"	(4) #12 AWG, (1) #12 GND	WIRE THROUGH 3-WAY SWITCHES.
C-01	TRANSFORMER SECONDARY NEUTRAL OVERCURRENT TRIP	(E) TRANSFORMER 1 51N RELAY	SWITCHGEAR (COMPARTMENT 9)	3/4"	(2) #12 AWG	
C-02	TRANSFORMER SECONDARY NEUTRAL OVERCURRENT TRIP	(E) TRANSFORMER 2 51N RELAY	SWITCHGEAR (COMPARTMENT 3)	3/4"	(2) #12 AWG	
C-03	EXTERNAL LOAD SET KW	ONAN MASTER CONTROL	(E) GENERATOR	1"	(1) #16 TSP	
C-04	GENERATOR CONTROL (DC)	ONAN MASTER CONTROL	(E) GENERATOR	1"	(18) #14 AWG	
C-05	SPARE	ONAN MASTER CONTROL	(E) GENERATOR	1"	PULL STRING ONLY	
C-06	GENERATOR BUS SENSING (AC)	ONAN MASTER CONTROL	SWITCHGEAR (GENERATOR BREAKER)	1"	(10) #14 AWG	
C-07	GENERATOR BREAKER (52-G) CONTROL (DC)	ONAN MASTER CONTROL	SWITCHGEAR (GENERATOR BREAKER)	1"	(24) #14 AWG	
C-08	UTILITY BREAKER (52-U) CONTROL (DC)	ONAN MASTER CONTROL	SWITCHGEAR (UTILITY BREAKER)	1-1/4"	(37) #14 AWG	
C-09	UTILITY BUS SENSING (AC)	ONAN MASTER CONTROL	SWITCHGEAR (UTILITY BREAKER)	1"	(10) #14 AWG	
C-10	DC CONTROL POWER	ONAN MASTER CONTROL	DC BATTERY	1"	(2) #12 AWG	
C-11	SPARE	ONAN MASTER CONTROL	SWITCHGEAR	1"	PULL STRING ONLY	
C-12	LONWORKS CONNECTION	ONAN MASTER CONTROL	(E) GENERATOR	1"	(1) CAT 5	
C-13	HBMWD NETWORK CONNECTION	"HUMGEN" DAT A INTERFACE PANEL	(E) HBMWD CONTROL ROOM SWITCH	2"	4-STRAND OPTICAL FIBER	
C-14	PROTECTIVE RELAY NETWORKING	ONAN MASTER CONTROL	SWITCHGEAR (RELAYS)	1"	(2) CAT 5	
C-15	SPARE	VAULT HH-6	SWITCHGEAR	2"	PULL STRING ONLY	
C-16	SPARE	VAULT HH-6	SWITCHGEAR	2"	PULL STRING ONLY	

PANEL SCHEDULE

PANEL NAME: **AC PANEL** VOLTAGE: 240/120 NEMA RATING: 1 MOUNTING: SURFACE NOTES:
MAINS RATING: 100 A MCB PHASE: 1 AIC RATING: 10,000 LOCATION: SWITCHGEAR BLDG (IPA)
BUS RATING: 100 A WIRE: 3 DEMAND FACTOR: STD

CKT NO.	USE	DESCRIPTION	BKR SIZE	CKT KVA	CKT AMPS	WIRE SIZE	WIRE LENGTH (FT)	VOLTAGE DROP %	PHASE	VOLTAGE DROP %	WIRE LENGTH (FT)	WIRE SIZE	CKT AMPS	CKT KVA	BKR SIZE	DESCRIPTION	USE	CKT NO.
1	L	INDOOR LIGHTING	20/1	0.44	3.67	12	20	0.20	A	0.38	20	12	13.00	1.56	20/2	DC BATTERY CHARGER	O	2
3	L	OUTDOOR LIGHTING	20/1	0.09	0.73	12	20	0.04	B	0.38	20	12	13.00	1.56	20/2	DC BATTERY CHARGER	O	4
5	R	INDOOR RECEPTS	20/1	0.72	6.00	12	20	0.33	A	0.48	20	12	8.33	1.00	20/1	15KV SWGR SPACE HEATER	H	6
7	R	OUTDOOR RECEPTS	20/1	0.54	4.50	12	20	0.25	B	0.48	20	12	8.33	1.00	20/1	15KV SWGR SPACE HEATER	H	8
9	H	HEAT PUMP	50/2	2.50	20.83	12	20	0.60	A						20/1	SPARE		10
11	H	HEAT PUMP	50/2	2.50	20.83	12	20	0.60	B						20/1	SPARE		12
13	H	EXHAUST FAN	20/1	0.50	4.17	12	35	0.42	A						20/1	SPARE		14
15	O	NETWORK SWITCH	20/1	0.50	4.17	12	20	0.24	B						20/1	SPARE		16
17	O	PANEL VIEW	20/1	0.50	4.17	12	20	0.24	A						20/1	SPARE		18
19	O	ONAN COMMAND CENTER	20/1	0.50	4.17	12	30	0.36	B						20/1	SPARE		20
21	O	"HUMGEN" DATA INTERFACE PANEL	20/1	0.15	1.25	12	30	0.11	A						20/1	SPARE		22
23		SPACE							B							SPACE		24
25		SPACE							A							SPACE		26
27		SPACE							B							SPACE		28
29		SPACE							A							SPACE		30

CONNECTED KVA		DEMAND KVA	DEMAND AMPS
PHASE A:	7.4	7.5	62.3
PHASE B:	6.7	6.7	55.9

STD DEMAND LOAD BASED ON 125% OF THE LARGEST MOTOR AND 100% OF THE REMAINING MOTORS, 125% OF CONTINUOUS LOADS, 100% OF NONCONTINUOUS LOADS, AND 50% OF RECEPTACLE LOADS BEYOND THE FIRST 10KVA

USE LEGEND

ID	LOAD TYPE	ASSUMED PF
H	HVAC	0.85
L	LIGHTING	0.80
M	MOTOR	0.85
R	RECEPTACLE	0.80
P	PANEL	0.85
O	OTHER	0.85

VOLTAGE DROP CALCULATION

VOLTAGE DROP IS BASED ON THE IEEE RED BOOK AND 2011 NEC CHAPTER 9 TABLE 9 FORMULA:
VD = I * (R * PF + X * SIN(ACOS(PF)) * L
WITH AN ADDITIONAL MULTIPLIER OF 2 FOR SINGLE PHASE AND 1.732 FOR 3-PHASE LOADS
R AND X VALUES ARE TAKEN FROM 2011 NEC CHAPTER 9 TABLE 9. LENGTH IS IN 1000FT

ASSUMPTIONS:
POWER FACTOR VARIES BY LOAD TYPE
CONDUIT TYPE RGS
WIRE MATERIAL CU

No.	Issue	Drawn	Approved	Date
1	ISSUE FOR BID	S.D.	P.K.	11/5/2019

Bar is one inch on original size sheet
0 1"

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Drawn	S. DAVIS	Designer	J. KING
Drafting Check	N. STEVENS	Design Check	R. GUGGIANA
Project Manager	P. KASPARI	Date	11/25/2019
		Scale	NONE

This document shall not be used for construction unless signed and sealed for construction.

Client HUMBOLDT BAY MUNICIPAL WATER DISTRICT
Project 12 kV SWITCHGEAR RELOCATION
Title ELECTRICAL SCHEDULES
Project No. 11186675
Original Size ANSI D
Sheet No. E-604
Sheet 18 of 24

Plot Date: 25 November 2019 - 11:21 AM Plotted By: Nathan Stevens
Filename: N:\US\Eureka\Projects\11\11186675 HBMWD-12kV Switchgear Replacement\06-CAD\Sheets\11186675_18_E604_ElectSchedules.dwg