

# MEMO

**Discussion/Action  
Item #: 15**



Meeting Date: October 21, 2022

To: Board of Directors  
From: Director of Engineering and Compliance, Guy R. Petraborg  
Approved by: General Manager, Felipe Melchor

**Subject: Approve \$600,000 of Additional Funding to Amend the WMD-AWPF Medium Voltage Project Budget from \$3.89 Million to \$4.49 Million for Design Modifications to Develop MicroGrid Capabilities for this Electrical Connection**

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## Recommendation

That the Board approve \$600,000 of additional funding to amend the WMD-AWPF Medium Voltage Project budget from \$3.89 Million to \$4.49 Million for design modifications to develop microgrid capabilities for this electrical connection.

## Background

In 2016 the District (ReGen) entered into a memorandum of understanding agreement with Monterey One Water (M1W) to supply 1800 kilowatts (KW) of electricity from ReGen's renewable energy generation plant (aka Landfill Gas-To-Energy (LFGTE) Plant) to the Advanced Water Purification Facility (AWPF) being planned by M1W. The project plan was for M1W to take the lead role of project delivery and design, permit, and build the infrastructure necessary to connect to a dedicated meter at ReGen's LFGTE Plant, and for ReGen to provide a supporting role during project delivery. The design was finalized in 2018 and then subsequently bid to solicit construction proposals in both 2019 and 2020. The October 2019 Engineer's Estimate (Kennedy Jenks Consultants) of construction costs for the project was \$1.3 million. The March 2020 bids ranged from \$2.3 million to \$2.44 million. The AWPF Phase 1 project finished construction in 2019 and began full scale deep well injection operations early in 2020 utilizing utility power from PG&E. Due to a variety of reasons, very little response to both bid solicitations was received by M1W and the bids received were over the project cost estimates and approved budget. M1W then put the WMD to AWPF Medium Voltage project on hold.

In the Fall of 2020, ReGen and M1W decided to switch roles on the project whereby ReGen would take the lead role and M1W would take a support role on delivering the project for both agencies. ReGen then authorized Kennedy Jenks Consultants to assess the potential for value engineering design modifications and specification improvements. Their findings were presented in a Technical Memorandum dated March 11, 2021 and indicated the potential for cost savings through value engineering design modifications of the electrical transmission alignment and removal of several 'sole source' requirements for several switchgear, protective relay, and control

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*Let's not waste this.*



equipment. The Board then approved a Kennedy Jenks Consultant’s scope of work in March 2021 to amend the project design plans and specifications accordingly. In October 2021 the Board authorized the call for construction bids. The call for bids occurred in November 2021 and three construction bids were then received on December 7, 2021 at a public bid opening meeting at ReGen’s Administrative office as follows:

Anderson Pacific Eng. Const., Inc.	Santa Clara, CA	\$ 2,876,400
PB Electric, Inc.	Rancho Cordova, CA	\$ 3,179,874
Blocka Construction, Inc.	Pleasanton, CA	\$ 4,235,000

The construction bids were both significantly greater than the Engineer’s Cost Estimate of \$2,001,000 and ReGen’s approved budget for the project. The bid results were conveying the continued significant price escalation in the construction industry associated with supply chain challenges, inflationary pressures, labor shortages, and wage increases all in the backdrop of conducting business in the COVID-19 pandemic. The table below presents a revised estimate of costs (JAN 2022) associated with construction of the project utilizing the lowest qualified bid received from Anderson Pacific. The project’s revised cost estimate was \$3.89 million.

Item	Budget Cost
<b>Construction Bid Cost (Based on Alignment A)</b>	\$2,876,400
<b>Potential Additional Bid Cost for Alignment B</b>	\$140,000
<b>Recommended Construction Contingency Budget (~10%)</b>	\$302,000
<b>Construction Subtotal</b>	<b>\$3,318,400</b>
<b>Engineering Services During Construction</b>	\$189,243
<b>Construction Management</b>	\$329,058
<b>Recommended Construction Management Contingency (~10%)</b>	\$52,000
<b>Construction Management Subtotal</b>	<b>\$570,300</b>
<b>Total Recommended Budget</b>	<b>\$3,888,700</b>

At the January 2022 meeting the Board of Directors i) approved a revised funding approval for the project to align with a \$3.89 million budget and ii) approved the lowest qualified bid submitted by Anderson Pacific of \$2,876,400.



## Discussion

Since awarding the construction contract, the Anderson Pacific construction team has been coordinating with suppliers of major electrical equipment and preparing the detailed technical submittals that are required for submittal by the construction contract. The technical submittals are reviewed and commented on by the Kennedy Jenks team in their role as the Engineer of Record and prior to the procurement order for the equipment. The general plan of project delivery is completing technical submittals and major equipment procurement orders in 2022, minor site work and foundations in early 2023, and the transmission line and major equipment installation in late 2023. The supply chain issues that have been reported frequently during the COVID-19 pandemic continue to be present in the construction industry in the current unsettled economic market conditions and are affecting both ReGen and M1W projects and major equipment purposes. This delay has provided the opportunity for staff to consider modifying the WMD-AWPF Medium Voltage design to incorporate microgrid capabilities into what is currently a standard electrical transmission design.

To advance the design amendment of the WMD-AWPF Medium Voltage project at this time, staff proposes to i) seek \$462,500 of funding associated with a Change Order to the Anderson Pacific construction contract for procurement and installation of certain electrical equipment for the 'transmission portion' as part of this construction project and ii) seek \$87,500 of funding associated with a Change Order to the engineering service contracts of both Kennedy Jenks (Engineer of Record – Medium Voltage Project) and Kupper Engineering (ReGen's electrical engineering consultant). Refer to Attachment A, RFQ 002: Switchgear Modifications for Island Mode Operation (9-16-2022), for a description of the scope for the proposed Change Order to the Anderson Pacific construction contract. These scope items would be delivered as part of the project's major installation work scheduled for the end of next year. In contrast, the proposed Change Orders for the engineering services would be for technical feasibility assessments of the existing infrastructure to determine what modifications would be necessary to accomplish microgrid operational capabilities. This primarily involves i) the equipment inside ReGen's renewable energy plant, ii) the control of that equipment to monitor and balance 'electrical supply' to 'electrical demand' and iii) the communication between the AWPF electrical equipment and ReGen's power plant control system. The results of the technical feasibility assessments will result in defining a power control system and the control equipment needed to accomplish microgrid system operations, and related future funding requests.

In a related matter, staff is also reconsidering the Backup Standby Generator Replacement for the campus area (Admin office, Shop, LCM, and HHW) that is associated with the PG&E Electrification agreement that the Board recently approved (whereby the small service natural gas supply from PG&E would be discontinued and electric water heaters/heating units would be installed). Staff plans to investigate solutions for providing backup power supply to the Gas Plant in addition to the campus area. Backup power supply to the Gas Plant would allow for the LFG Blower Skid and LFG Flare to operate when there is an outage on the PG&E power grid. The Backup Power supply topic also has relevance in a microgrid design. When a microgrid is operating as an 'island' due to a utility grid outage, there is a possibility that the 'island' mode operation can also



have an outage. When a microgrid has an outage, it creates the scenario of a need to re-start the microgrid 'island' power generation; this requires that there be a backup power supply present (an emergency generator). Restarting a microgrid 'island' power generation is called a 'black start' operation and requires that there be a backup power source available to restart the engine-generator sets. Staff and the engineering consultants for the WMD-AWPF Medium Voltage project will assess the scope of infrastructure improvements that would be necessary to accomplish 'black start' capabilities for a microgrid.

### **Financial Impact**

The financial impact associated with approving an increase to the WMD-AWPF Medium Voltage Project's budget is that \$600,000 of additional funding would need to be provided (~ \$400,000 in the current fiscal year). The additional \$600,000 of capital infrastructure funds would be obtained from either i) excess cash in FY22-23 or ii) the Capital Infrastructure Reserve or both; assuming that the Approved Capital Infrastructure Budget is fully expended in FY22-23 and that there are no capital project costs savings during the fiscal year. Thus, the \$600,000 is reasonably available to support the additional funding for the project in the event that the Board concurs with staff's recommendations to develop microgrid capabilities as part of this current electrical connection construction project.

The Return on Investment (ROI) associated with an assumed capital expenditure of a \$5 million project is predicted to be less than 7 years. It is also estimated that M1W would receive a reduction in electrical costs at a faster rate than that attributed to the financial benefits of the ROI earned by ReGen. Both of these elements are positive benefits to each agency, respectively. In addition, should microgrid capabilities be established as part of this AWPF Medium Voltage project, it would likely then form the baseline structure to later connect to both the Primary Treatment Facility (sewage treatment) and the Tertiary Treatment Facility (AG Recycled Water supply) at M1W as part of an initial microgrid for the two agencies. This would have the benefits of i) lowering initial capital investment costs for a microgrid and ii) allow more time for the development of a larger microgrid that includes other third parties and with the deferral of the substantial capital investments associated with a larger microgrid involving multiple third parties.



Item Description	Budget Cost (Approved JAN 2022)	Proposed Cost Amendment for MicroGrid Prelim. Design (OCT 2022)	Proposed Amended Budget Cost (as of OCT 2022) <sup>1,2</sup>
Construction Bid Cost (Based on Alignment A)	\$2,876,400	N/A	\$2,876,400
Potential Additional Bid Cost for Alignment B	\$140,000	N/A	\$140,000
Added Construction Cost (MicroGrid Transmission Equipment) <sup>1</sup>	N/A	\$382,500	\$382,500
Future Construction Cost (MicroGrid Load/Supply Control Equipment) <sup>2</sup>	N/A	TBD	TBD
Recommended Construction Contingency Budget (~10%) <sup>1</sup>	\$302,000	\$80,000	\$382,000
<b>Construction Subtotal <sup>1</sup></b>	<b>\$3,318,400</b>	<b>\$462,500</b>	<b>\$3,780,900</b>
ENG Services - Preliminary Design for MicroGrid Capabilities <sup>1</sup>	N/A	\$50,000	\$50,000
ENG Services - Final Design Amendments for MicroGrid Capabilities <sup>2</sup>	N/A	TBD	TBD
Engineering Services During Construction <sup>1</sup>	\$189,243	\$25,000	\$214,243
Construction Management <sup>1</sup>	\$329,058	\$50,000	\$379,058
Recommended Construction Management Contingency (~10%) <sup>1</sup>	\$52,000	\$12,500	\$64,500
<b>Construction Management Subtotal <sup>1</sup></b>	<b>\$570,300</b>	<b>\$87,500</b>	<b>\$657,800</b>
<b>Total Recommended Budget <sup>1</sup></b>	<b>\$3,888,700</b>	<b>\$600,000</b>	<b>\$4,488,700</b>

### Strategic Plan

The proposed amendment to the WMD-AWPF Medium Voltage Project to seek microgrid functionality as part of this project aligns with our Community, Innovation, and Environment stewardship interests. The potential here is to create a more sustainable operations framework that will yield cost savings to the customers of both agencies and the communities served for years to come. In addition, this endeavor has the capability to contribute to the state’s goals of electrification and reduction of short-lived pollutants.

### Conclusion

Staff requests that the Board approve \$600,000 of additional funding to amend the WMD-AWPF Medium Voltage Project budget from \$3.89 Million to \$4.49 Million for design modifications to develop microgrid capabilities for this electrical connection.

### Attachment:

A – RFQ 002: Switchgear Modifications for Island Mode Operation (9-16-2022)

**To:** Anderson Pacific Engineering, Inc.  
1390 Norman Avenue  
Santa Clara, CA. 95054

**Page:** 1 of 2  
**Date:** 16 September 2022  
**K/J Job No.:** 2168003.02  
**Serial No.:** RFQ-002 Switchgear Modifications  
for Island Mode Operation  
**Project:** WMD to AWPf MV Project

**Attn:** Gary Barber

**RFQ 002: Switchgear Modifications for Island Mode Operation**

The District would like to modify the switchgear to accommodate Island Mode Operation. Island Mode Operation would allow the District cogeneration units to continue to operate to supply power to the AWPf when PG&E service is no longer available. This work is contained to the switchgear and will not impact equipment owned by PG&E.

Please see the attached switchgear single line diagram and site layout drawing showing revisions to accommodate Island Mode Operation and the description of the work to be done below.

**Please furnish a detailed quotation to do the following:**

***Work to be done (Extra Work)***

- 1) Add a new cubicle, Cubicle 6 21kV Main Circuit Breaker, to the right side (viewing from the front) of the MV Switchgear lineup next to Cubicle 5 21KV AWPf Feeder Protection and Control.
- 2) Remove the 21kV Switch 89-Site Cubicle from the MV switch equipment.
- 3) Relocate Line PT's, incoming Arrestors, incoming metering CT's, incoming SEL 735 meter and all associated control equipment to the Cubicle 6 21kV Main Circuit Breaker to be added.
- 4) Install the relocated Line PT's and Arrestors on the incoming bus to the new Main Circuit Breaker.
- 5) Install the relocated metering CT's on the bus side bushing of the new Main Circuit Breaker.
- 6) Install the relocated SEL 735 meter and associated wiring and control components in the Cubicle 6 21kV Main Circuit Breaker to be added. Connect to metering CT's on the Bus side of the new Main Circuit Breaker.
- 7) Provide 3-new multi ratio 600/200/5 CT's, similar to the ones used on the feeder CB 52WG, on the line side bushing of the new Main Circuit Breaker. Install the 3-new multi ratio 600/200/5 CT's in Cubicle 6 21kV Main Circuit Breaker to be added.
- 8) Provide 3-new PT's, similar to the others used on this project, and install on the switchgear bus and wire as shown on the single line diagram.
- 9) Remove the 2-SEL 351-7 relay from the MV Switchgear equipment.
- 10) Provide 2-new SEL 700G#XNAL relays to replace the SEL 351-7 relays. Install the 2-new SEL 700G#XNAL relays in Cubicle 3 21KV-240/120V CPT, Site and WMD Metering and Communications and wire to the new Main Circuit Breaker line side 600/200/5 CT's.
- 11) Provide a larger concrete pad to accommodate the large MV Switchgear required per the above. Coordinate with Eaton on final switchgear size. Provide a pad with additional 1 ft on each side of and behind the switchgear.

***Work to be eliminated (Work Omitted):***

- 1) None

**Request for Quote**

RFQ-002 Switchgear Modifications for Island Mode Operation

16 September 2022

Page 2 of 2

**Distribution:**

Contractor (original)

Job File

Project Coordinator

Resident Engineer

**By:**



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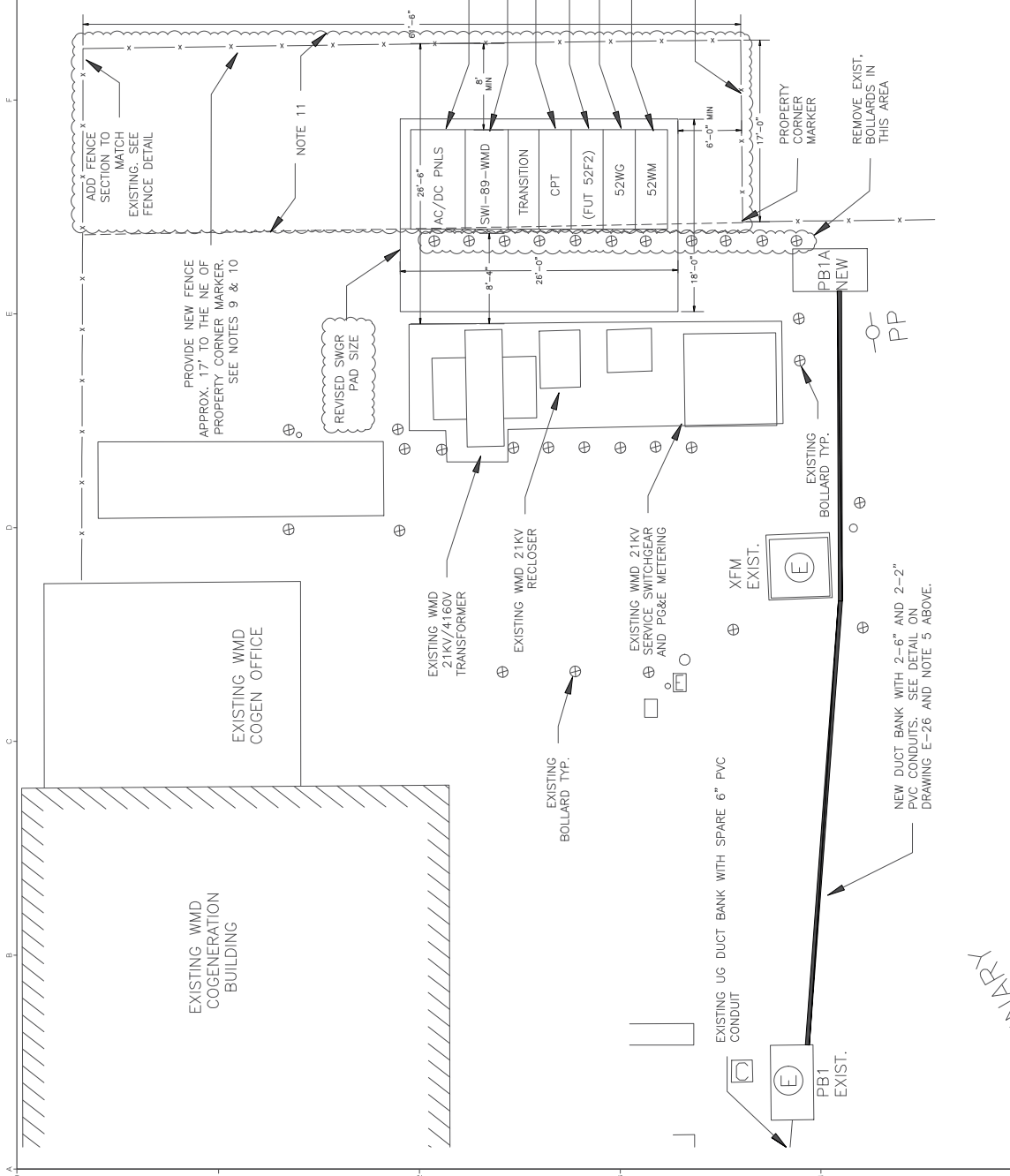
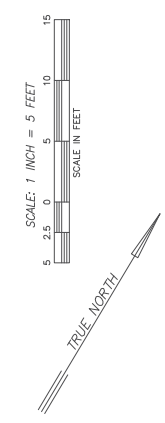
Rich Jones, Katherine Tee

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- NOTES:
- REFER TO DRAWING E-17 FOR CONDUIT AND CABLE DETAILS.
  - REFER TO DRAWING E-18 FOR GROUNDING DETAILS.
  - EXISTING 21KV WMD CABLING BETWEEN THE RECLOSER AND THE 5MVA TRANSFORMER TO BE REMOVED.
  - INSTALL CONDUIT AND CABLING TO CONNECT THE NEW 21KV SWITCHGEAR.
  - NEW AWPF FEEDER SHALL BE CONNECTED THROUGH NEW PULL BOX PB1 AND NEW DUCTBANK TO EXISTING PULL BOX PB1. EXISTING SPARE 6" CONDUIT AND NEW UNDERGROUND AND OVERHEAD 21KV DISTRIBUTION SYSTEM SHALL BE USED TO PROVIDE GENERATOR POWER TO AWPF.
  - OUTFITTED FUTURE SPACE IS PROVIDED FOR ENERGY STORAGE SYSTEM. SPARE CONDUITS SHALL BE PROVIDED TO PULL BOX PB8.
  - NEW WMD SWITCHGEAR CONCRETE PAD IS SHOWN AS 17'-0" LONG BY 18'-0" WIDE. PAD SHALL BE SIZED FOR DIMENSIONS OF PROVIDED SWITCHGEAR. SEE DRAWING S-1.1.
  - SITE INCLUDES MANY ACTIVE AND ABANDONED UNDERGROUND UTILITIES. CONTRACTOR SHALL POHOLE ALONG DUCTBANK AND CONDUIT ROUTES TO LOCATE UTILITIES.
  - ALL FENCE POSTS TO BE GALVANIZED IN A 12 INCH DIAMETER AUGURED HOLE, FILLED WITH CONCRETE AROUND EACH POLE.
  - MINIMUM OF 3'-FT EMBEDMENT.
  - CLEAR AND GRUB AREA BOUNDED BY NEW FENCE. PROVIDE GRADING AND SUBGRADE PREPARATIONS IN ACCORDANCE WITH NOTE 4 IN DETAIL S-3342 ON DRAWING S-1. GRADE AT NEW AREA SHALL MATCH GRADE AT (E) WMD SWITCHGEAR.

- NEW STATION SERVICE EQUIPMENT
- NEW 21KV SWITCH TO WMD TRANSFORMER
- NEW OPT AND COMMUNICATIONS
- FUTURE WMD 21KV SPARE CIRCUIT BREAKER
- NEW WMD 21KV FEEDER TO AWPF
- NEW WMD 21KV MAIN CONNECTED TO RECLOSER

ADD FENCE SECTION TO PROPERTY CORNER MARKER. MATCH EXISTING FENCE



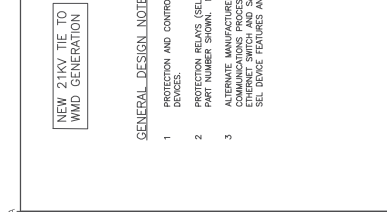
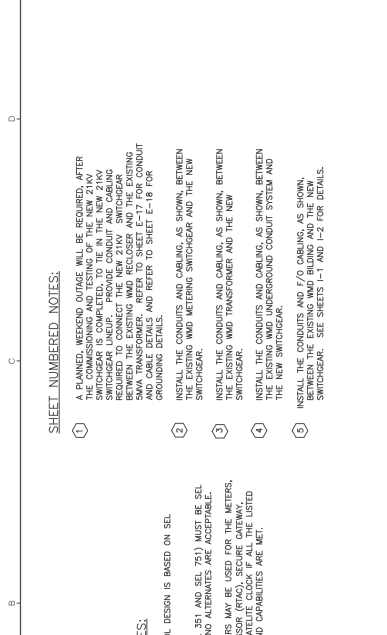
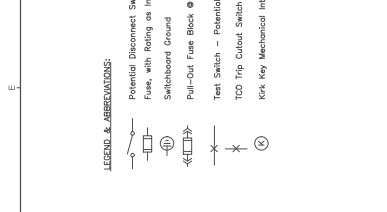
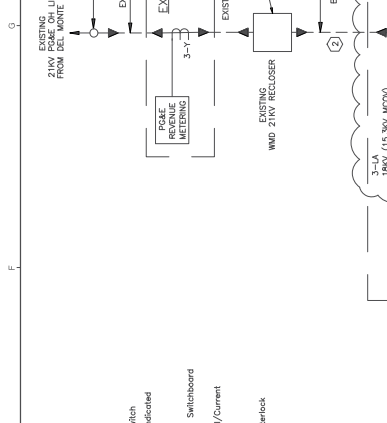
<p><b>CONFORMED DRAWING</b></p> <p>THIS DRAWING IS THE PROPERTY OF THE CLIENT AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. THE CLIENT'S RESPONSIBILITY IS TO PROTECT THIS DRAWING FROM UNAUTHORIZED DISSEMINATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.</p>		<p>FILE NAME</p> <p>JOB NO. 218800701</p> <p>DATE 02/08/2021</p> <p>SHEET E-2</p>
<p>MRWMD TO AWPF</p> <p>MEDIUM VOLTAGE SYSTEM</p> <p>WMD 21KV SWITCHGEAR</p> <p>SITE PLAN</p>		<p>DESIGNED</p> <p>DRAWN</p> <p>CHECKED</p>
<p>MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT</p> <p>MARINA, CA</p> <p>Kennedy Jenks</p> <p>275 Battery Street, Suite 150, San Francisco, CA, 94111</p>		<p>APPROVED</p> <p>DATE</p> <p>BY</p>



**NEW 21KV TIE TO WMD GENERATION**

**SHEET NUMBERED NOTES:**

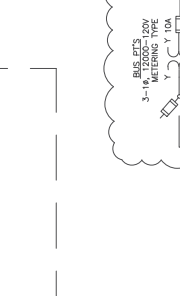
- A PLANNED, WELDING OUTAGE WILL BE REQUIRED, AFTER SWITCHGEAR IS COMPLETED, TO TIE IN THE NEW 21KV SWITCHGEAR LINES. PROVIDE CONDUIT AND CABLES BETWEEN THE EXISTING WMD RECLOSER AND THE EXISTING WMD RECLOSER. PROVIDE CONDUIT AND CABLE DETAILS AND REFER TO SHEET E-18 FOR GROUNDING DETAILS.
- INSTALL THE CONDUITS AND CABLEING, AS SHOWN, BETWEEN THE EXISTING WMD METERING SWITCHGEAR AND THE NEW SWITCHGEAR.
- INSTALL THE CONDUITS AND CABLEING, AS SHOWN, BETWEEN THE EXISTING WMD TRANSFORMER AND THE NEW SWITCHGEAR.
- INSTALL THE CONDUITS AND CABLEING, AS SHOWN, BETWEEN THE EXISTING WMD UNDERGROUND CONDUIT SYSTEM AND THE NEW SWITCHGEAR.
- INSTALL THE CONDUITS AND CABLEING, AS SHOWN, BETWEEN THE EXISTING WMD UNDERGROUND CONDUIT SYSTEM AND THE NEW SWITCHGEAR. SEE SHEETS I-1 AND I-2 FOR DETAILS.



**GENERAL DESIGN NOTES:**

- PROTECTION AND CONTROL DESIGN IS BASED ON SEL DEVICES.
- PROTECTION RELAYS SEL 351 AND SEL 751 MUST BE SEL PART NUMBER SHOWN. NO ALTERNATES ARE ACCEPTABLE.
- ALTERNATE MANUFACTURERS MAY BE USED FOR THE METERS, COMMUNICATIONS PROCESSOR (FMC), SECURE GATEWAY, SECURITY GATEWAY, AND CAPABILITIES ARE MET.

**LEGEND & ABBREVIATIONS:**



**RELAY DEVICE LIST**

DEVICE	MANUFACTURER	TYPE	CAT. NUMBER
200U/7.5	SEL	RELAY	200U/7.5
600/200/5	SEL	RELAY	600/200/5
200/5 CT	SEL	CT	200/5 CT
240/120V	SEL	AC PANEL	240/120V
480C	SEL	AC PANEL	480C
480C	SEL	AC PANEL	480C
480C	SEL	AC PANEL	480C

**DESCRIPTION:**  
 21KV Feeder, Phase/Neutral OK, Sync, Check Rule 21 Relay, Over/Under Volt/Freq, 32 Min. Import, Synch, Star/Tie, Synch, Synchronizing Check, Real Time Automation Controller, Security Gateway

**MECHANICAL INTERLOCK LIST**

DEVICE	MANUFACTURER	TYPE	CAT. NUMBER
K2	KELCH	MECH. LOCK	K2

**CONFORMED DRAWING**

THIS DRAWING IS THE FINAL DRAWING AND DRAWING AND BEING A PROFESSIONAL ENGINEER'S SEAL AND SIGNATURE ARE REQUIRED FOR THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT. ANY CHANGES TO THIS DRAWING AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY PERMITS AND APPROVALS FOR THE CONSTRUCTION OF THE PROJECT. ANY CHANGES TO THIS DRAWING SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY PERMITS AND APPROVALS FOR THE CONSTRUCTION OF THE PROJECT.

**MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT**

275 Battery Street, Suite 250, San Francisco, CA 94111  
 Kennedy Jenks  
 MARINA, CA

**MIRWMD TO AWPF MEDIUM VOLTAGE SYSTEM**

WMD 21KV SWITCHGEAR SINGLE-LINE DIAGRAM

FILE NAME: ...  
 JOURNAL: 2168020701  
 DATE: OCTOBER 2021  
 SHEET: E-3