

# RIVERSIDE PUBLIC UTILITIES

## Board Memorandum

**BOARD OF PUBLIC UTILITIES**

**DATE:** NOVEMBER 26, 2018

**ITEM NO:** 7

**SUBJECT:** BID NO. RPU-7583 FOR THE MULTI-SUBSTATION CIRCUIT BREAKER REMOTE RACKING FROM E.E. ELECTRIC, INC IN THE AMOUNT OF \$411,011.14 AND WORK ORDER NO. 1826998 IN THE AMOUNT OF \$619,000

**ISSUES:**

Award Bid No. RPU-7583 to E.E. Electric, Inc., for the Multi-Substation Circuit Breaker Remote Racking Project in the amount of \$411,011.14, and approve Work Order No. 1826998 in the total amount of \$619,000.

**RECOMMENDATIONS:**

That the Board of Public Utilities:

1. Award Bid No. RPU-7583 for the Multi-Substation Circuit Breaker Remote Racking Project to E.E. Electric of Mira Loma, California, in the amount of \$411,011.14; and
2. Approve Work Order No. 1826998 in the total amount of \$619,000.

**BACKGROUND:**

Medium voltage circuit breakers are housed in a switchgear and are an essential and integral part of the protection system. They provide protection against abnormal conditions such as faults and overcurrent in the distribution system and within the substations.



*Typical Medium Voltage Circuit Breaker*



*Typical Switchgear*

During routine maintenance or capital improvement projects, the substation electricians manually rack-out circuit breakers to remove them from service. Circuit breaker racking is one of the leading reasons for electrical explosion known as arc flash, which is recognized by the Occupational Safety and Health Administration (OSHA) and National Electrical Safety Code (NESC) as a workplace hazard. Arc flash hazards present a serious risk to workers and can cause fatalities and injuries.



*Manual Racking of Circuit Breaker*



*Arc Flash Explosion*

## **DISCUSSION:**

In accordance with the NESC requirement, Riverside Public Utilities (RPU) engineering staff performed an assessment to determine the exposure level of the arc flash hazard to employees at the substations. The study revealed that the level of exposure at the substations is extensively high and that a mitigation method is required to minimize staff risk especially during high-risk activity such as circuit breaker racking.

One of the most effective mitigation methods is to increase the distance between the operator and the potential source of arc flash during circuit breaker racking by utilizing remote racking mechanisms. Remote racking allows the operator to stand up to 80-feet away from the circuit breaker during the process of removal and insertion of circuit breakers.

To improve employee safety at the substations, staff identified 85 circuit breakers housed in 12 switchgears at six substations for upgrades to accommodate remote racking mechanisms. Additionally, 114 infrared windows will be installed at these switchgears to allow employees to perform an infrared inspection of the switchgear bus without opening the protective doors or covers.



Circuit Breaker Remote Racking



Infrared Window

Bid No. RPU-7583, Multi-Substation Circuit Remote Racking Project, was posted on the City's Online Bid System on July 20, 2018 and closed September 4, 2018. Two contractors submitted bids for the specified construction. Staff evaluated the bids and deemed E.E. Electric, Inc. of Mira Loma, California to be the lowest responsive and responsible bidder.

The bid was under the engineer's estimated amount of \$520,000. The bids are summarized in the table below:

Vendors	City Location	Bid Amount	Rank
1. E.E. Electric	Mira Loma, CA	<b>\$411,011.14</b>	<b>1</b>
2. ABB, Inc.	Anaheim, CA	\$498,000.00	2
➤ Engineer's Estimate		\$520,000.00	

The project breakdown for the Multi-substation Circuit Breaker Remote Racking is proposed as follows:

Multi-substation Circuit Breaker Remote Racking Project Breakdown:	
Project Management and Design	RPU Engineering Staff
Construction Performed By:	E.E. Electric, Inc.
Inspection and QEW	RPU Substation Electrician
<b>Anticipated Start Date:</b>	<b>January 7, 2019</b>
<b>Anticipated Duration:</b>	<b>Four months</b>

The Multi-Substation Circuit Breaker Remote Racking Project breakdown of the total capital expenditure is as follows:

DESCRIPTION	AMOUNT
Design and Project Management	\$60,000
Construction Contract (RPU-7583)	\$411,011.14
Construction Inspection and QEW	\$86,400
10% Project Contingency	\$61,588.86
<b>Work Order Total</b>	<b>\$619,000</b>

The Purchasing Manager concurs that the recommended actions are in compliance with Purchasing Resolution No. 23256.

**FISCAL IMPACT:**

The total fiscal impact is \$619,000. Sufficient funds are available in Public Utilities Account No. 6130100-470616.

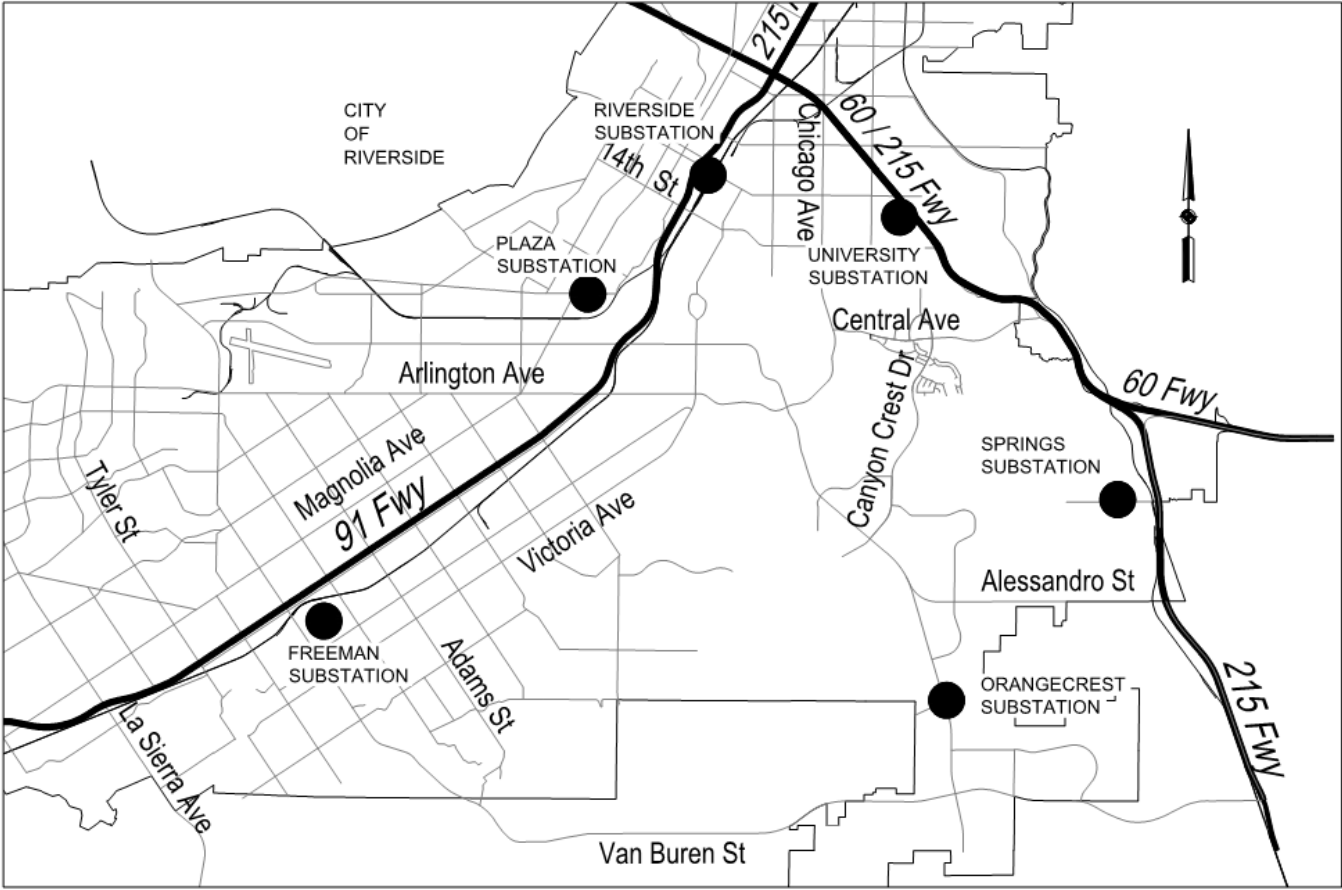
Prepared by: George R. Hanson, Utilities Assistant General Manager/Energy Delivery  
Approved by: Todd L. Jorgenson, Interim Utilities General Manager  
Approved by: Al Zelinka, FAICP, City Manager  
Approved as to form: Gary G. Geuss, City Attorney

Certifies availability  
of funds: Aileen Ma, Interim Utilities Assistant General Manager/Finance & Administration

**Attachments:**

1. Bid Award Recommendation
2. Presentation

Attachment 1: Project Site Map



● PROJECT LOCATION

MULTI-SUBSTATION REMOTE RACKING PROJECT  
SITE MAP