



RIVERSIDE PUBLIC UTILITIES

Board Memorandum

BOARD OF PUBLIC UTILITIES

DATE: NOVEMBER 14, 2022

SUBJECT: AWARD BID NO. RPU-7927 FOR FURNISHING AND DELIVERING TWO SUBSTATION POWER TRANSFORMERS TO VIRGINIA TRANSFORMER CORPORATION, OF ROANOKE, VIRGINIA, IN THE AMOUNT OF \$2,986,263 PLUS 10% CONTINGENCY IN THE AMOUNT OF \$298,000; WORK ORDER NO. 2219619 IN THE AMOUNT OF \$1,995,000 FOR UNIVERSITY SUBSTATION TRANSFORMER NO. 4 REPLACEMENT PROJECT, AND WORK ORDER NO. 2202776 IN THE AMOUNT OF \$2,500,000 FOR LA COLINA SUBSTATION IMPROVEMENT PROJECT

ISSUES:

Consider awarding Bid RPU-7927 for furnishing and delivering two substation power transformers to Virginia Transformer Corporation, of Roanoke, Virginia, in the amount of \$2,986,263 plus 10% contingency in the amount of \$298,000; and approve the capital expenditures for Work Order No. 2219619 in the amount of \$1,995,000 for University Substation Transformer No. 4 Replacement Project, and Work Order No. 2202776 in the amount of \$2,500,000 for La Colina Substation Improvement Project.

RECOMMENDATIONS:

That the Board of Public Utilities:

1. Award Bid RPU-7927 for furnishing and delivering two substation power transformers to Virginia Transformer Corporation, of Roanoke, Virginia, in the amount of \$2,986,263 plus 10% contingency in the amount of \$298,000;
2. Approve the capital expenditure for Work Order No. 2219619 in the amount of \$1,995,000 for University Substation Transformer No. 4 Replacement Project, which includes all design, construction, equipment purchase, construction support, contract administration, and inspection;
3. Approve the capital expenditure for Work Order No. 2202776 in the amount of \$2,500,000 for La Colina Substation Improvement Project, which includes all design, construction, equipment purchase, construction support, contract administration, and inspection; and
4. Authorize the City Manager, or designee, to execute any documents necessary to effectuate the project described herein, as well as the ability to make minor and non-substantive changes in alignment with all purchasing policies.

BACKGROUND:

Substation power transformers (transformers) are essential components of the electrical power grid, and are critical to the reliability and optimum operation of the electric grid. On average, a single substation transformer serves over 3,000 customers. Substation power transformers are among the most expensive components used in the electric distribution system. This is due to their design and the complexity of the manufacturing process. As such, substation power transformers are critical assets in Riverside Public Utilities' (RPU) electric system and play a key role in providing reliable electric service.

The average expected life of a substation power transformer is approximately 40 years. The age of a transformer is a significant factor in electric system reliability, safety, and maintenance costs. A transformer's loading capability declines as it ages because it reduces its ability to handle electrical and mechanical stresses encountered during normal operation. Several of the substation transformers in RPU's system have exceeded or are reaching the end of their design life.



Typical Substation Power Transformer

A single unit's failure can significantly impact the electric system's reliability and the safety of employees and the general public. Replacement of a substation power transformer due to a catastrophic failure is costly, and replacement units are not readily available due to their long

manufacturing lead time. Planned replacement of deteriorating transformers is prudent and responsible for minimizing the risk of prolonged power outages due to transformer failures.

DISCUSSION:

RPU is committed to providing safe and reliable electric service to all customers. As part of RPU's effort to identify and replace aging infrastructure, RPU plans to replace transformer no. 2 at the La Colina substation (La Colina T2) and transformer no. 4 at the University substation (University T4).

University T4 is a 30-year-old transformer that experienced an internal fault and field assessment and testing revealed that the transformer catastrophically failed and cannot return back to service. Currently, the customer load is being temporarily served by mobile substation transformer no. 2 until a new transformer is procured and installed.

La Colina T2 is a 55-year-old transformer that reached the end of its design life. In addition to the transformer's age, Dissolved Gas Analysis (DGA) and electrical testing results were evaluated and considered. Oil samples are extracted from the transformer's main tank and tested at a laboratory for specific gas signature traces. DGA testing results provide a reliable indication of a transformer's internal health and are considered the best industry standard to diagnose incipient faults in transformers. La Colina T2's DGA values indicated significant deterioration of the unit, further bolstering the recommendation to replace the unit before a costly transformer failure in service.

Bid No. RPU-7927 was posted on the City's Online Bid System on June 14, 2022, and closed on August 2, 2022. Five vendors submitted bids for the specified transformers. Staff evaluated the bids and deemed Virginia Transformer Corporation, Roanoke, Virginia, to be the lowest responsive and responsible bidder. The bid was within the engineer's estimated amount of \$3,360,000. The Purchasing Manager deemed the other three submitted bids non-responsive because bidders provided incomplete bid forms, and took exceptions to the terms and conditions and equipment delivery schedule. The final bid amounts were evaluated by considering the proposal base amount, transformer operating costs, spare parts, and compliance with specifications pursuant to Bid No. RPU-7927. The bids are summarized in the table below.

Vendors	City Location	Bid Amount	Rank
Virginia Transformer Corporation	Roanoke, VA	\$2,986,263	1
WEG Transformers USA	Washington, MO	\$4,868,910	2
OTC Services Inc. (Equipment Marketing & Listing Service Inc.)	Louisville, OH	\$3,362,915	(non-responsive)
Delta Star Inc. (HighPoint Power Systems)	San Carlos, CA	\$4,281,219	(non-responsive)
Hitachi Energy (Pacific Utilities)	Crystal Springs, MS	\$5,281,453	(non-responsive)
➤ <i>Engineer's Estimate</i>		\$3,360,000	

The replacement of the substation transformers will include the removal and disposal of the existing transformers and the installation of the new units. The proposed work also includes demolition, installation of new foundations, and related electrical and underground work. RPU field forces will perform the civil and electrical work, construction, and equipment testing. The electrical and physical design will be performed by RPU engineering staff. A consultant firm will

perform structural engineering design and analysis. A consultant firm will perform the transformer design review and the factory acceptance testing.

The breakdown for University Substation Transformer No. 4 Replacement Project total capital expenditure Work Order No. 2202776 is as follows:

Project and Fiscal Breakdown		
Work Type	Performed By:	Amount (\$)
Project Management and Engineering Design	RPU Engineering Staff	\$67,000
Structure Analysis and Design	Consultant	\$45,000
Factory Acceptance Testing and Transformer Design Review	Consultant	\$48,000
Construction, Testing and Commissioning	RPU Field Forces	\$147,000
Virginia Transformer Corporation		\$1,310,177
Contingency (10% of Transformer Cost)		\$131,000
Construction Material		\$246,823
Work Order Total:		\$1,955,000
Anticipated Start Date:		March 2023
Anticipated Duration:		15 months

The breakdown for La Colina Substation Improvement Project total capital expenditure Work Order No. 2219619 is as follows:

Project and Fiscal Breakdown		
Work Type	Performed By:	Amount (\$)
Project Management and Engineering Design	RPU Engineering Staff	\$82,000
Structure Analysis and Design	Consultant	\$45,000
Factory Acceptance Testing and Transformer Design Review	Consultant	\$48,000
Construction, Testing and Commissioning	RPU Field Forces	\$222,000
Virginia Transformer Corporation		\$1,676,085
Contingency (10% of Transformer Cost)		\$167,000
Construction Material		\$259,915
Work Order Total:		\$2,500,000
Anticipated Start Date:		January 2023
Anticipated Duration:		15 months

The Purchasing Manager concurs that the recommended actions are in compliance with Purchasing Resolution No. 23812.

STRATEGIC PLAN ALIGNMENT:

This item contributes to **Strategic Priority 6 - Infrastructure, Mobility and Connectivity** and **Goal 6.2** – Maintain, protect, and improve assets and infrastructure within the City's built environment to ensure and enhance reliability, resiliency, sustainability, and facilitate connectivity.

This item aligns with each of the five Cross-Cutting Threads as follows:

1. **Community Trust** – Planned replacement of deteriorating infrastructure with equipment that complies with current standards will improve safety and reliability of the electric system is a prudent and responsible action that helps build community trust and results in the greater public good.
2. **Equity** – The replacement of the substation transformers has been established based on engineering planning and operational criteria, with equitable distribution of services to ensure every member of the community has equal access to share the benefits of community progress.
3. **Fiscal Responsibility** – This item represents fiscal responsibility by identifying and replacing aging infrastructure, providing optimal electrical system reliability, safety, and efficiency, and reducing potential equipment and system failures and overall operational costs. The lowest price for the replacement units and thereby the best value for RPU's customers was ensured through a competitive bidding process.
4. **Innovation** – RPU is committed to identifying creative solutions to meet the needs of our community members, effectively and efficiently by providing innovative infrastructure improvements. A collaborative and efficient approach has been used to replace the aging electric infrastructure to minimize potential disruptions to our customers in the future.
5. **Sustainability & Resiliency** – This project ensures that new substation transformers and related system upgrades provide grid modernization and reliability that is expected to last well into the future.

FISCAL IMPACT:

The total fiscal impact is \$4,495,000. Sufficient funds are available in Public Utilities Substation Transformer Upgrade Capital Account No. 6130100-470632.

Prepared by: Daniel Honeyfield, Utilities Assistant General Manager/Energy Delivery
Approved by: Todd M. Corbin, Utilities General Manager
Approved by: Kris Martinez, Assistant City Manager
Approved as to form: Phaedra A. Norton, City Attorney

Certifies availability of funds: Edward Enriquez, Interim Assistant City Manager/Chief Financial Officer/City Treasurer

Attachments:

1. Project Site Map

2. Bid Award Recommendation
3. Presentation