

RIVERSIDE PUBLIC UTILITIES

Board Memorandum

BOARD OF PUBLIC UTILITIES

DATE: JULY 25, 2016

ITEM NO: 3

SUBJECT: CABLE REJUVENATION PILOT PROJECT TO TEST THE TREATMENT OF UNDERGROUND ELECTRIC CABLE TO EXTEND ITS USEFUL LIFE – WORK ORDER NO. 1525067 FOR \$449,000

ISSUE:

The issue for Board of Public Utilities consideration is to approve a capital expenditure in the amount of \$449,000 for Work Order No. 1525067 for a Cable Rejuvenation Pilot Project to test the treatment of underground electric cable to extend its useful life.

RECOMMENDATION:

That the Board of Public Utilities approve a capital expenditure of \$449,000 for Work Order No. 1525067 which includes all design, construction, contract administration, and inspection costs for the Cable Rejuvenation Pilot Project.

BACKGROUND:

The Riverside Public Utilities (RPU) system includes approximately 252 miles of high voltage 12kV (kilo-Volt) primary Cable in Conduit (CIC) which was installed in the 1970's. Underground cable failures are the source of some of the longest electric service interruptions. As the cable ages and deteriorates, replacement must be considered and planned. Typical replacement costs for this system are high, often over \$1,000,000 per mile, due to the trenching required to install a new conduit system for this cable into developed areas. This type of construction is time consuming and has a large customer impact. Last fiscal year, RPU completed the replacement of approximately two miles of CIC.

The purpose of this cable rejuvenation pilot project is to test a high technology treatment for aged cable. The proprietary process injects a special fluid into the cable to strengthen weak points and achieve service life extension. The process rejuvenates underground distribution cable by filling voids in the cable's insulation layer and eliminating water contamination. This alternative method complements RPU's on-going cable replacement effort. The average cost for cable testing and rejuvenation treatment is \$13 per foot compared to over \$200 per foot for conventional conduit and cable replacement.

The process has gained industry acceptance and is being used successfully at neighboring utilities including Southern California Edison, San Diego Gas & Electric, and Los Angeles Department of Water and Power. When applied to suitable cable, this process improves reliability, and defers cable replacement for twenty additional years. Deferring the invasive civil construction needed to replace CIC systems saves both time and money, dramatically reducing customer impact.

The integrity of the cable is tested as part of the process to assure it is a good candidate for the rejuvenation injection process. Cables with severely deteriorated conductors or insulation may not be suitable for treatment. Cables determined to be unsuitable for treatment will be prioritized for conventional cable replacement at a later date.

This pilot project will test and treat approximately 8,500 cable feet of cable on circuit 1505. The construction work impacts 14 existing underground structures and related equipment. Nine deteriorated structures will be repaired or replaced. Eleven deteriorated transformers will also be replaced. All new equipment will be upgraded to RPU's current standards. This pilot will test the rejuvenation injection process on RPU's equipment and determine a complete set of criteria to be used for application of this process in the future.

All construction work will be performed by contractors from the Energy Delivery Contractors' Panel. Novinium, Kent WA, will perform training, testing, and the proprietary treatment as a subcontractor. Structural repair or replacement work will be inspected by Public Works and Energy Delivery construction inspectors. The cable testing, treatment, and equipment replacement will be inspected by qualified personnel assigned from the Electric Field forces. The work will require multiple planned service interruptions which will be scheduled at least 48 hours in advance with impacted customers. Planned outages will be limited to four hours and are not permitted when temperatures are projected to exceed 90 degrees.

Staff coordinated with Public Works regarding the allowable working hours for the project. The work will occur during normal daytime working hours between 8:30 AM and 3:30 PM.

The project breakdown is as follows:

Project Breakdown	
Engineering Performed By:	RPU Engineering staff
Civil Construction Performed By:	Contractors' Panel
Electrical Work Performed By:	Contractors' Panel
Inspection Work Performed By:	RPU Field Forces
Anticipated Start Date:	August 2016
Anticipated Duration:	30 Days
Coordination Required With:	• Contract Administration • Public Works • RPU Field Forces
Reimbursements:	None

The Work Order breakdown is as follows:

Work Order Breakdown	Sub-total	Percent of Total
Design, Construction Management	\$45,000	10%
Inspection	\$68,000	15%
Construction Contract	\$336,000	75%
Work Order Total	\$449,000	100%

FISCAL IMPACT:

Sufficient funds are available in Public Utilities' Cable Replacement Account No. 6130000-470635. If the Cable Rejuvenation Pilot proves to be a cost effective means for extending the life of primary cable, the Cable Replacement Program will be expanded to treat rather than replace deteriorated cable where conditions are suitable for this approach. Deteriorated cable tested and found to be unsuitable for treatment will continue to be replaced using conventional methods.

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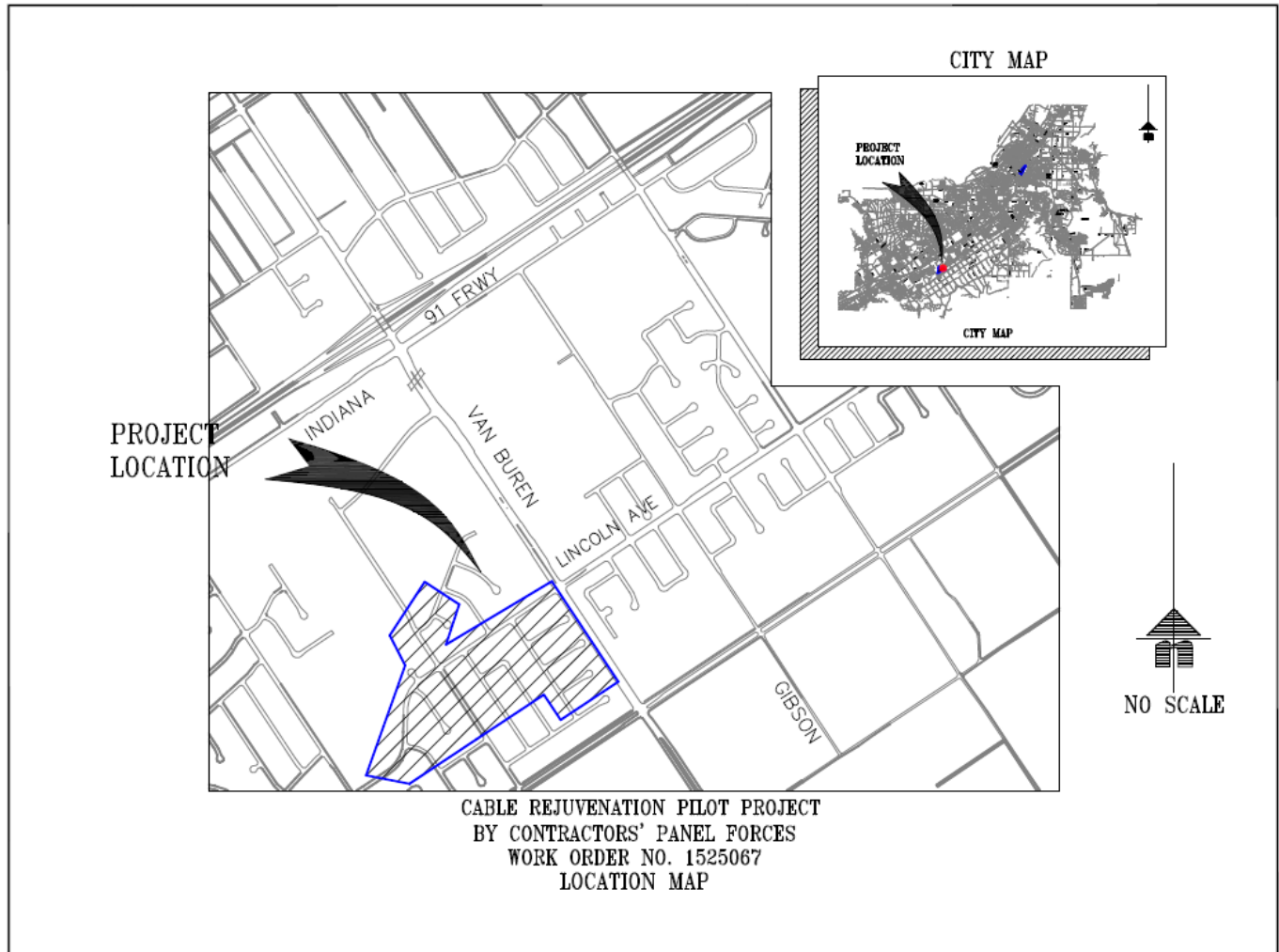


Figure 1- Location Map