



COUNTY OF FRESNO

DEPARTMENT OF PUBLIC WORKS & PLANNING
STEVEN E. WHITE, DIRECTOR

2021 Local Streets & Roads Award Nomination

SUPPORTING DOCUMENTATION

Category:
**Efficient and Sustainable Bridge Maintenance,
Construction & Reconstruction Projects**

**Outside Canal Bridge Replacement Project
on Russell Avenue**



The Outside Canal Bridge on Russell Avenue is located in northwestern Fresno County, approximately 11 miles northwest of the town of Firebaugh (See Attachment A). The surrounding area is largely rural and agricultural, and Russell Avenue is a major connector to I-5 in the region. A 2011 Caltrans Bridge Inspection Report (BIR) indicated that the replaced structure was a 91' long CIP/RC slab bridge that was built in 1954 and later widened in 1971.



Before: Russell Avenue bridge in a 2006 photo.



Before: Outside Canal looking west at the east side of the Russell Avenue bridge.

The western San Joaquin Valley has experienced extensive subsidence due to depletion of the underground aquifer over decades of groundwater pumping and periods of severe drought. Subsidence is an unfortunate reality for the

western San Joaquin Valley as very little can be done to halt it, even if groundwater pumping were to cease immediately. The State of California passed the Sustainable Groundwater Management Act (SGMA) in 2014; however, farmers are not required to fully comply until 2040.

While the original bridge was built several meters above the water's surface, subsidence caused the bridge to sink up to 11 feet from its original design elevation. As a result, the bridge superstructure frequently became submerged below water



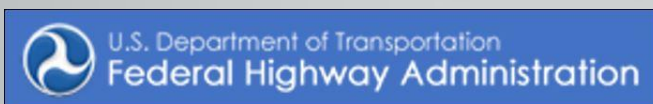
Before: Southward view of the west side of the bridge, which had become submerged.

causing road closures and long detours. This constant saturation had caused extensive deterioration and restricted water flow, and the bridge urgently needed to be replaced.



Before: Northward view of the east side of the bridge, showing the effects of subsidence.

The responsibility to repair damaged road and bridge structures falls upon local agencies, who must apply for Federal and State grant funding to facilitate subsidence-related repairs. Federal Highway Bridge Program funding was obtained to aid in the replacement costs.





The lead design firm for the project was Cornerstone Structural Engineering Group and the construction contractor was Agee Construction, Inc.



The canal is owned and maintained by Central California Irrigation District (CCID), who partnered with Fresno County and contributed half of the

agency's local match for the project. CCID also played a major role in facilitating the County's construction efforts by agreeing to restrict flows in the channel during construction.

Reinforced concrete pipe installation in February of 2020.





Due to seasonal flow requirements, CCID advised the County that the work in the channel had to be completed by April 1, 2020 and Russell Ave. be opened to traffic on May 1, 2020. A number of delays occurred after the award of the project on October 22, 2019 which caused a two month delay.

Agee Construction received their Notice to Proceed on December 2, 2019, upon which they accelerated their delivery. Their employees worked six 10-hour days per week to facilitate the accelerated schedule.

Agee also significantly reduced the project costs by eliminating the \$500,000 on-site detour in the original project plans, which was intended to maintain traffic

on Russell Avenue during construction. In lieu of the planned detour, Agee proposed closing the road to traffic and diverting the traffic to nearby parallel connecting roads. This proved to be more cost effective and successful for the construction efforts and did not create a hardship for the community.

Road closure signs seen in place throughout the project.





After: East side view of the new double box culvert at high water levels.

The replacement structure is a cast-in-place, reinforced concrete double box culvert approximately 100' long, 40' wide. The road profile was raised approximately 4 feet which required retaining walls on both sides of the roadway. Also, several irrigation pipes were replaced with pre-cast concrete pipes as part of the project. The structure headwalls are stepped to allow for the wall heights to be increased in the future to accommodate additional subsidence.



After: East side view of the new double box culvert at low water levels.

After: West side view of the new double box culvert at high water levels.



After: West side view of the new double box culvert at low water levels.



After: Southward view of the stepped west wall.





After: Russell Avenue looking south over the bridge, showing retained visibility for drivers.



The County of Fresno Department of Public Works and Planning takes pride in delivering quality projects to the community while ensuring safety and delivery in a timely manner at a reasonable cost.

Despite the timing challenges and numerous change orders, the project was completed on time and opened to traffic on schedule and under budget!

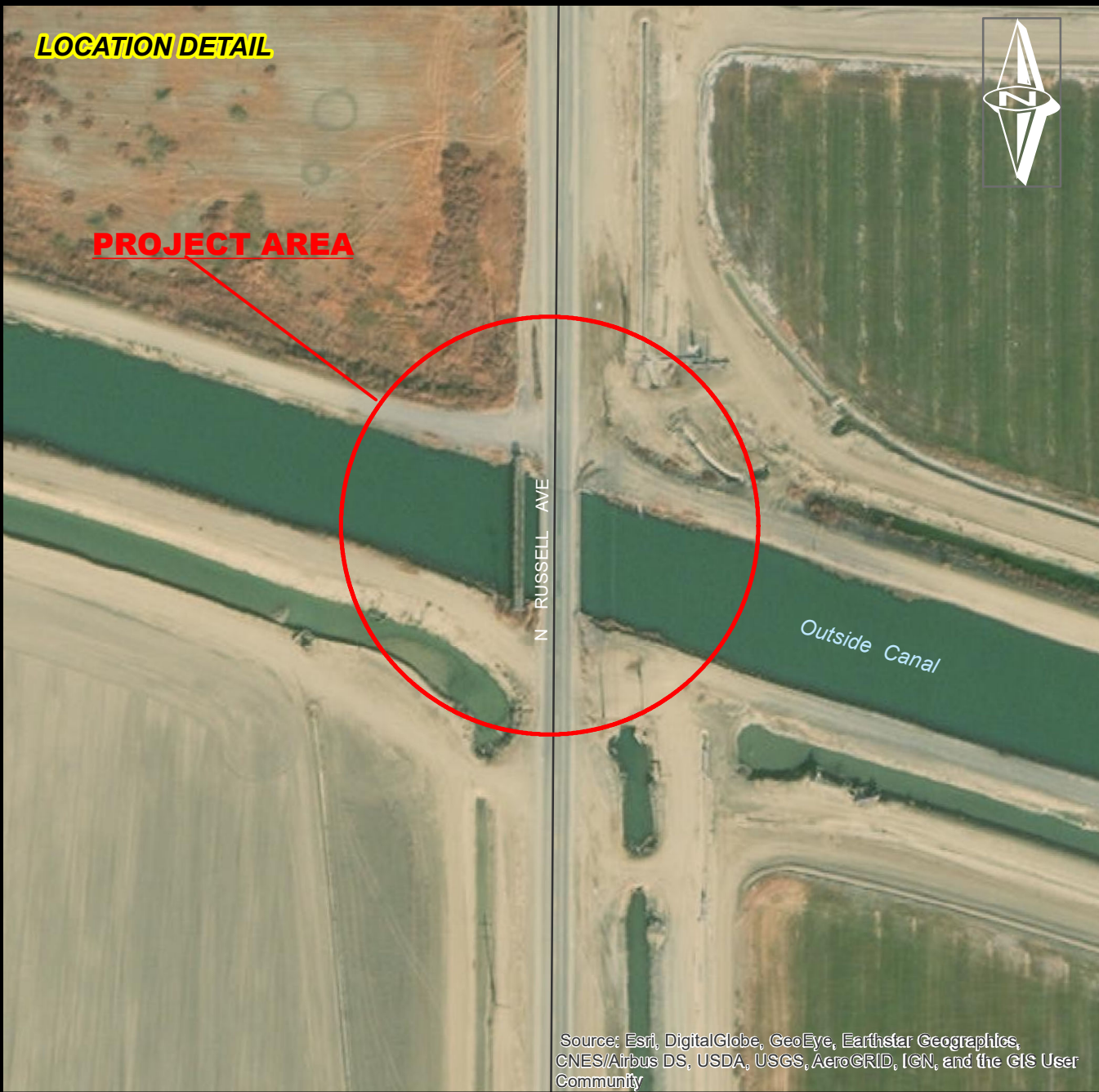
Original Engineer's Estimate: \$3,484,495

Original bid from Agee: \$3,810,616

Final construction cost: \$3,436,119

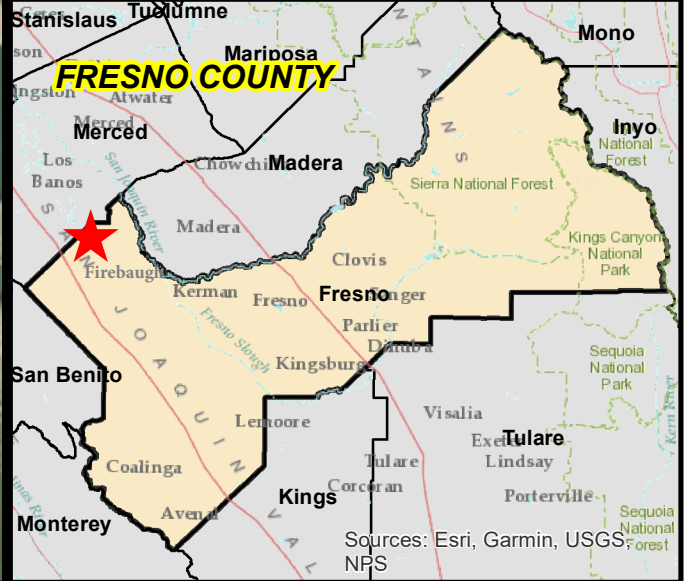
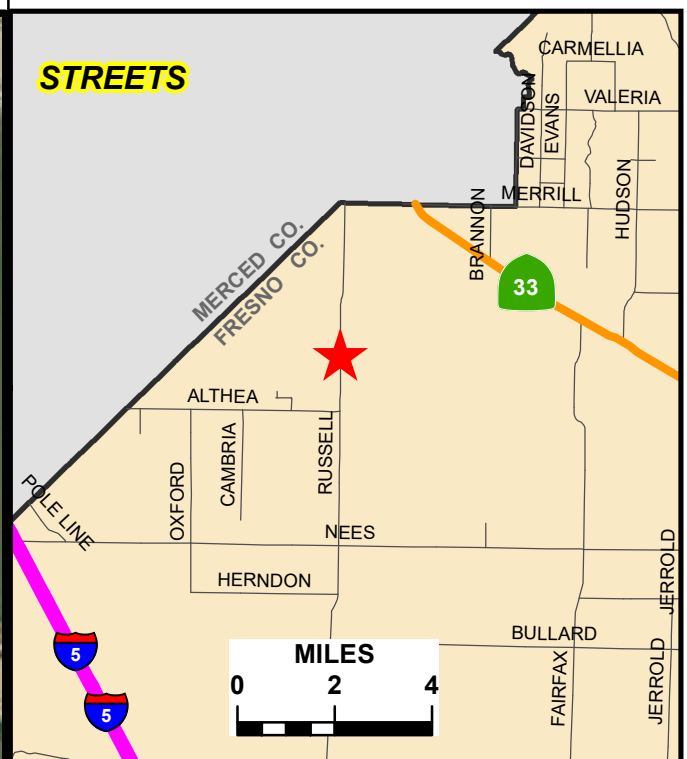
LOCATION DETAIL

PROJECT AREA



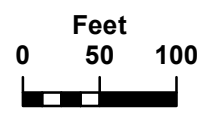
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

STREETS



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 Date: 12/21/2020
 Agency: County of Fresno
 Department: Public Works & Planning
 Division: Design/Transportation Planning

SCALE IN FEET



DEPARTMENT OF PUBLIC WORKS & PLANNING

**ATTACHMENT A
 OUTSIDE CANAL BRIDGE REPLACEMENT
 ON RUSSELL AVENUE**

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