

## SOUTHERN CALIFORNIA CHAPTER

Association of Environmental & Engineering Geologists

# APRIL 2022

# DINNER MEETING

# ANNOUNCEMENT

**Matt Pendleton**  
Chairperson

**Dean Francuch**  
Vice-Chair

**Alison Franco**  
Treasurer

**Topher Amador-French**  
Secretary

**Marissa Meredith**  
Social Media Outreach Manager

DATE: Tuesday, April 5, 2022

SPEAKER: **Dean Francuch**, PG, CEG  
Senior Associate  
Shannon & Wilson, Inc.

Over the past 35 years, Dean has been actively conducting and managing projects involving geotechnical engineering and engineering geology for engineered facilities ranging from landfills, mines, transportation corridors, as well as residential and commercial developments. For the last 12 years, Dean's professional experience has had a greater focus on railroad-related geologic and geotechnical problems in the western U.S., working on locations in southern and northern California, Nevada, Montana, Arizona, and Colorado. Dean also previously worked part-time as a licensed

locomotive engineer for the Fillmore & Western Railway in Ventura County, which allowed him to use his railroad operations knowledge to help develop effective geotechnical solutions for mainline railroad operations. Dean earned his B.S. in Geology from Cal State Northridge in 1987, and attended graduate classes at Cal State Los Angeles, San Diego State, Cal Poly Pomona, and University of Nevada, Reno.



TOPIC: **BNSF Railway Southern "Transcon" Mainline Dual Track Bridge Replacement over the Mojave River, Victorville, California**

See following page for abstract.

PLACE: Victorio's Ristorante  
10901 Victory Blvd  
North Hollywood, CA 91606

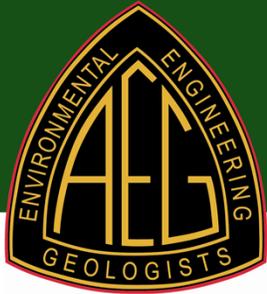
TIME: 5:45 – Social Hour  
6:45 – Dinner  
7:30 – AEG Business  
7:45 – Speaker

COST: \$40 – AEG Members  
\$45 – Non-Members  
\$20 – Students

REGISTER: <https://aegsocial.brownpapertickets.com/>

**ABOUT YOUR CHAPTER:** The SoCal Chapter of the AEG has played a significant role in the development of the environmental & engineering geology profession since the early 1980's and continues to provide networking opportunities at local technical seminars by leading experts.

**ATTENTION!** PLEASE REGISTER BY 11.00am, MONDAY, APRIL 4. REGISTERING WILL ALLOW US TO GIVE THE RESTAURANT AN ACCURATE HEADCOUNT. IF THE ESTIMATE IS WRONG, THE SECTION WILL EITHER PAY FOR DINNERS NOT CONSUMED OR SOME MEMBERS WON'T EAT.



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**BNSF Railway Southern “Transcon” Mainline Dual Track Bridge Replacement over the Mojave River,  
Victorville, California**

Dean Francuch, P.G., C.E.G.,  
Shannon & Wilson, Inc., 100 N. 1st Street, Burbank, CA 91502

**ABSTRACT**

The Burlington Northern Santa Fe (BNSF) Railway needed to replace two aging steel truss bridges on their southern “Transcon” mainline. The bridges, built in 1886 and 1923, which carry approximately 80 trains a day, required upgrading to handle heavier and more frequent loads. They were also plagued with static electricity discharge from low-hanging high-tension wires from Los Angeles Department Water and Power electrical transmission lines. The static electricity affected maintenance on the bridge, as railway workers would receive electrical shocks while working on the bridge superstructure. The new bridge would be a two track at-grade combination concrete and steel structure, with foundations and abutments designed to carry a future 3rd track. Additionally, approximately 2000 feet of track would need to be realigned, which required 700 linear feet of new cuts up to 40 feet high, in granitic bedrock.

Geologic and environmental conditions for the bridge included foundation excavation into shallow granitic bedrock, subsurface delineation between granitic boulders vs. in-place bedrock, and exploration constrained by frequent train traffic and access to either side of the bridge over the Mojave River, which has year-round water flow in this location due to the shallow bedrock. Exploration techniques included both continuous core drilling in the abutment areas, and test pits within the river alluvium. For the cut slopes, a detailed mapping program was completed to determine potential daylighted joints.

Starting in November 2019, construction of the new railroad bridge required erection of a temporary access span on the west side of the existing railroad bridge for cranes and equipment used to build the new bridge as well as disassemble the existing bridges. Access road construction to the temporary bridge required the stabilization of the existing tracks, building a 10-foot-high retaining wall with a series of rock bolts drilled below the existing tracks while trains were running. The new bridge required a central pier founded in the granitic bedrock below the river channel alluvium. Because of the uncertainty of the alluvium-bedrock contact, specialized drilling techniques, as well as full-time geologic observation were required to assure that the pier was founded in bedrock and not on alluvial boulders. Explosives were used to create the new cuts in granite on the east side of the new alignment. Careful planning was required during blasting to ensure that the adjacent active track was undisturbed. The new bridge was completed and opened to train traffic in March 2021.

