

NIV5

UNDERGROUND TRANSMISSION



SYCAMORE TO PEÑASQUITOS 230KV TRANSMISSION LINE

SAN DIEGO, CA | SAN DIEGO GAS & ELECTRIC

The SX-PQ 230kV transmission line project consisted of approximately 12 miles of underground cable that traverses developed residential and commercial areas, congested city streets, undeveloped high fire-risk areas, and a 16-lane major interstate to reliably serve the areas where most of San Diego County's 3.6 million residents live. The project helped offset the retirement of 3 power plants, ensuring the area can meet the forecast for energy demand as the region grows, and brings increasing amounts of renewable energy safely and reliably to regional load centers.

NV5 was integral to every phase of the project –from concept to construction, with work that included engineering, design, permitting, surveying, and construction support for the underground system. NV5 performed preliminary route studies and planning, engineering, design and construction support on 12 miles of 230kV underground. NV5 worked with 12 local agencies and stakeholder groups to assist with community outreach, permitting, and developing a traffic management plan, designed traffic control plans, and obtained traffic control permits for the projects. NV5 worked with the project cable manufacturer to ensure cable design would meet project specifics, type testing and ampacity requirements. NV5 also performed construction staking, as built surveying and provided material testing and construction inspection services.

SEGMENT A – Construction of approximately 0.75 miles of new 230kV underground transmission line and relocated 138kV power line on new tubular steel poles and steel H-frame structures all within SDG&E's existing right-of-way located between the Sycamore Canyon Substation and a trail starting at Stonebridge Parkway. It also involved construction of a new cable pole at the transition point from overhead to underground.

SEGMENT B – Construction of approximately 11.5 miles of 230kV underground transmission line under existing roads and bridges.

SEGMENT C – Construction of approximately 2.2 miles of new 230kV transmission line and communication cable on existing 230kV tubular steel poles within SDG&E's existing right-of-way from Scranton Road to the Peñasquitos Substation. Construction of a new cable pole at the transition point from underground to overhead.

NV5's innovative approaches, flexibility, and diligence enabled successful project delivery, despite extraordinarily complex challenges, and helped SDG&E meet its goals. From a design perspective, crossing the 16-lane Interstate 15 was the most complicated challenge. The only feasible underground alternative was to bore a 1,000-foot tunnel up to 45-feet deep. Burial at that depth required innovation to properly manage heat buildup in the cables and avoid ampacity loss. Engineering and construction had to be incredibly precise and frequently monitored because the tunnel-bore machine used to dig under I-15 had the potential to cause settling damage to the freeway. Once across the freeway, the trench alignment passed through city streets containing 50 years' worth of utilities that created another challenge.



SERVICES

UG Transmission Design

Route Studies / Planning

Civil Engineering

Land Surveying

Permitting

Construction Support
& Inspection

Traffic Management Plan

Community Outreach

AWARDS

2019 ENR Regional Best
Projects Award (California /
Hawaii)

2019 ACEC California
Engineering Excellence Honor
Award

2019 ASCE San Diego
Outstanding Project

2019 APWA San Diego Project
of the Year