



CASE STUDY

Railway Utilities Replacement

DESCRIPTION

E&E was awarded the contract to decommission two failed nine-way duct banks running along the Metro Blue Line near Long Beach California. Over time, the broken-down, modular, plastic ducts had shifted and separated. The separation created a path for rainwater runoff. The runoff caused silts and soils to travel to separations, ultimately leading to the formation of sinkholes.

MAIN TASKS

- Use subterranean video to locate points of failure along the length of the 18 ducts.
- Develop a grouting methodology that could be employed on subsequent stretches of the Blue Line.
- Excavate a parallel trench, core drill into the sides of the existing access vaults and tie in the new ducts.
- Install pull lines for Metro to install new cabling into the new ducts.
- Backfill new duct bank with 3500 psi slurry.
- Resurface and seed to restore to natural condition while improving natural drainage.

CHALLENGES

Health and Safety – Much of the work was completed within fifteen feet of the active railway with overhead power. E&E worked closely with Metro's Division of Safety and Security to ensure the protection of the workers and safeguard the integrity of the railway.

Health and Safety – A portion of the old ducts were positioned beneath the railway tracks ballast. Special care was taken to identify evidence of daylighting or potential compromise to the railway line itself.

Engineering – Using meticulous volumetric calculation in conjunction with thorough video investigation, E&E determined the correct amount of slurry to achieve backfill of all voids to Metro's precise standards.

INTERESTING POINTS

Due to the design of the old duct banks, E&E had to develop a custom pressure grouting methodology. The newly designed methodology consisted of two fabricated steel plates, each comprising six-ball valves. The assemblies were installed at each end of the ducts. By starting at the lowest point, with the lowest valves closed, grout was injected with the air expelling through the open valves until grout was detected at each, at which point they were closed until all voids were filled. Any surface daylighting was monitored and logged.



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