

PROJECT DESCRIPTION

MSE Wall Evaluation & Corrosion Monitoring for NDOT



Location:
Las Vegas, Nevada
I-515/Flamingo Road

Client:
Nevada Department of
Transportation
Materials Division
1263 Stewart Street
Carson City, NV 89712

Client Contact:
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MSEW at I-515/Flamingo Road Viaduct, Las Vegas, NV

In 2004, as part of a highway improvement program, the Nevada Department of Transportation (NDOT) began constructing sound walls along the edge of the I-515. A shallow excavation for this sound wall foundation, near the I-515/Flamingo Road viaduct, exposed reinforcements near the top of a 20-year old metallically stabilized earth (MSE) wall, and elevated levels of corrosion were observed. The NDOT retained McMahon & Mann Consulting Engineers, P.C. (MMCE) to evaluate the factors contributing to elevated levels of corrosion, estimate the remaining service life, and recommend retrofit or replacement of existing facilities as necessary.

MMCE evaluated backfill characteristics, made direct measurements of metal loss on exhumed samples of steel reinforcements, and monitored corrosion rate on in service reinforcements using nondestructive tests. MMCE concluded that elevated levels of corrosion are attributed to the aggressiveness of the backfill, which had characteristics typical of soil and aggregates native to an arid environment. If the aggressiveness of the backfill is recognized, the observed corrosion rate is predictable and consistent with estimates of metal loss from mathematical models of service life, and observations available in the literature describing the performance of plain steel reinforcements at other sites. A reasonable comparison between direct physical observation and corrosion monitoring with nondestructive testing (NDT) using the linear polarization resistance (LPR) technique was observed, demonstrating that nondestructive testing with LPR provides a means to evaluate the condition of MSE walls and observe elevated levels of corrosion. Thus, NDT may be used to evaluate reinforcement condition at other sites.