

ASCE / SEI
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TITLE: CORROSION INVESTIGATION & TESTING OF POST-TENSIONED
CABLES

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Many well documented failures of post-tensioned cables have occurred and the potential seriousness of corrosion induced failures of post-tensioned cables is well recognized and understood. This paper presents two non-destructive means for investigating the probability of corrosion and for locating breaks or section reduction in post-tensioned cables. Also discussed are methods of mitigating the corrosion and extending service life to in-situ post-tensioned cables.

The principal cause of corrosion of bonded / grouted or un-bonded / un-grouted high strength post-tensioned cables is due to the presence of moisture (high humidity) and air (oxygen). Moisture infiltration can occur from various sources, including initial construction, leakage, and the nature for cementitious grouting in particular pour quality grouting. Early identification and mitigation of corrosive environments or media can significantly reduce the costs of major repairs and reduce the risk of failure. General principals and basic assumptions of corrosion as it relates to post-tensioned cables will be presented.

The first method is used for evaluating the corrosion potential of un-bonded cables, such as found in parking and other commercial structures. It has been found that in some instances it can also be used to determine the moisture content and probability of corrosion in grouted cables or grouted cables with voids. This technology advances the state-of-the-art in identifying the corrosive environment and can be used for mitigating the corrosion and extending service life to those 15-20 year or older parking structures with cables in “push-through” or “heat-sealed” sheathes.

The second non-destructive testing technology to be discussed is for locating cable breaks in both un-bonded and grouted post-tension cables. This includes poorly grouted cables

with voids, which is a common problem with segmental bridges built prior to 2002. This method can distinguish between mild and high strength steel and can be used whether the cable has metal or plastic sheathing.

This paper is best suited for sessions on “Existing Structures”, “State-of-the-Art Research & Implementation”, or “Evaluation, Monitoring, Serviceability”.