



SCS, Inc.

Materials and NDT Specialist • 610-692-6551

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SCS's mission is to preserve and extend the service life of infrastructure, cost effectively. We partner with our clients to identify and address infrastructure problems at the right time so that owners receive the maximum benefit at the lowest cost. SCS is committed to providing high quality services on time and on budget as infrastructure owners seek to ensure or improve the safety of their structures.

The key to preservation, and therefore cost savings, is to identify and quantify problems early. To quantify problems early when the structure seems to be in good condition requires tools that allow us to look through concrete, i.e. Non-Destructive Tools (NDT). Judicious use of NDT at the critical juncture can help to identify and quantify problems. Once the extent of the problems is known, SCS can identify solutions that effectively address the problems.

- **Non-destructive Testing Methods:**
- **Ground Penetrating Radar (GPR):** Detects and locates unseen objects below the earth's surface or enclosed in other materials. Can be used to avoid unnecessary damage, quality control and assurance, provide information for coring, locating tendons, etc., measure slab thickness, detect voids, etc.
- **Impact-Echo (IE):** Locates flaws and deterioration in concrete and masonry structures. Results can be found in depths of six feet or more. Can be used to measure thickness, dimensions, to find voids, cracks, etc.
- **Bore Scope:** Identifies corrosion condition of strands in tendons with voids
- **Ultrasonic Tomography (UT):** Locates large voids in concrete and PT ducts
- **Infrared Thermography (IR):** Locates near subsurface concrete/asphalt delamination
- **Corrosion Potentials:** Identifies rebar that experience high probability of corrosion
- **Corrosion Rate Meter:** Measures the rate of corrosion of steel embedded in concrete

Laboratory Capabilities:

As a part of inspection of bridges, tunnels, parking garages, marine structures, and other similar structures, consultants are required to determine the chloride profile along the depth, the cover over rebar, the properties of concrete such as alkalinity of concrete (pH), compressive strength (CS), Freeze Thaw (FT) durability and Alkali-Silica Reactive (ASR) Aggregates that will affect the service life of structures.

Siva Corrosion Services, Inc. (SCS) has extensive experience in assisting a number of engineering consultants throughout the country. We understand that the service life of concrete structures is affected by factors such as pH, CS, FT, ASR, concrete cover, and chloride profile. We identify and quantify primary factors that affect the durability of the structure under test, and provide repair recommendations that achieve the required service life. This information has proved crucial in making data driven decision to either repair/rehabilitate/replace a structure: Our capabilities include:

- Developing testing regimen to answer owners' questions and to collect samples to calculate remaining service life.
- Collecting cores and testing cores, as appropriate, for CS, FT, ASR, and chloride profiling.
- SCS laboratory capabilities include: dry cutting chloride cores at various test depths or horizons, pulverizing the entire disk from each of the depths until all of the powder passes the 50 sieve (per AASHTO T260), accurately weighting (sealed zero balance), digesting concrete powder samples in acid to extract chlorides, titrating, and calculating chloride concentrations at various depths.
- Using chloride profiles obtained from our laboratory work, we then calculate the time to corrosion initiation or future concrete damage if chlorides at the rebar are well above the threshold.
- We perform petrographic evaluation of the concrete per ASTM C856 to determine if ASR is present, how deep is the reaction is, and if ASR would significantly affect the future durability of the structure.
- In cases where FT is suspected, we perform ASTM C457 to evaluate the air content, pore size, and pore distribution within concrete to determine if the concrete has FT resistance.