



WBE certified company

# Corrosion of Buried Concrete and Steel Structures



**Brian T. Barnes, PE**  
**Senior Engineer**  
*Atlantic Testing Laboratories*

Corrosion of buried concrete and steel structures is a concern that must be addressed during the design of building, utility, and transportation structures. Deterioration of concrete and steel due to subsurface environmental factors can reduce the life expectancy and load carrying capacity of the affected structures. Consequently, corrosivity testing is typically required for structures that will be in direct contact with soil or water throughout the service life of the structure.

Corrosivity testing is typically performed in the laboratory, and sometimes in the field during the subsurface investigation phase of the project. Samples may be collected from soil borings or test pits. The results are then compared to published guidelines specified for the buried structure to evaluate corrosion potential and, if necessary, develop mitigation methods to limit effects of a corrosive environment on the structure.

ATL can perform the following tests to evaluate the corrosion potential of subsurface soil and groundwater.

- pH: Measure of hydrogen ion concentration that determines if a subsurface environment is acidic or alkaline, and potentially corrosive to the buried steel or concrete structure being considered.
- Soil Moisture Content: Measure of free and adsorbed water in a soil. Corrosion potential generally increases for buried steel and concrete structures with an increase in soil moisture content.
- Soil Resistivity/Conductivity: Measure of the electric conduction potential of a subsurface environment. The lower the soil resistivity, the higher the corrosion potential for buried steel and concrete structures.
- Sulfates/Chlorides: Measure of soluble salts in a subsurface environment. The higher the soluble salt concentration the higher the corrosion potential for buried steel and concrete structures



Corrosion of Buried Steel Structure



Corrosion of Bridge Abutment Foundation

- Organic Content: Soils with a high organic content generally have a higher corrosion potential for buried steel structures.
- Oxygen-Reduction Potential: Measure in millivolts of a soil or water to oxidize or reduce buried steel. The lower the ORP the higher the corrosion potential.



Corrosion of Buried Concrete Structure

ATL, a WBE certified company, can perform the above corrosion evaluation tests, which are used by the project design team to evaluate a site’s corrosion potential in accordance with AWWA standards for ductile iron pipe (DIP), FHWA Bridge Design Specifications for buried structures, and ACI 318 Building Code Requirements for Structural Concrete.

For more information, contact Brian Barnes, PE, at [315-735-3309](tel:315-735-3309), [info@atlantictesting.com](mailto:info@atlantictesting.com), or visit [AtlanticTesting.com](http://AtlanticTesting.com).

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