



Concrete Structure Failure Investigation





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Envista Forensics' concrete specialists use the most current technology and methods to determine the root cause of a failure or mal-performance. Our experienced team of structural engineers have consulted on projects around the globe. Their extensive knowledge spans all types of structures, from commercial to residential, industrial, institutional, and municipal, and includes repair design and construction drawings. Concrete failures take on many forms. Our job is to determine and find all symptoms of failure and then analyze and verify the cause.

Syptoms of concrete problems typically include:

- Spalling, cracking, scaling
- Collapse, settlement
- Moisture ingress
- Corrosion, deterioration
- Discoloration, staining
- Deflection, racking



CAUSES OF FAILURE MOISTURE INGRESS

Corrosion of steel embedded in concrete and deterioration of the concrete is the most common cause of failure of concrete structures. Moisture ingress can also lead to interior moisture damage.

What we do: Envista can help identify the causes and extent of corrosion and moisture ingress damage, and can recommend the necessary procedures to ensure long lasting repairs.

DEFICIENT DESIGN, CONSTRUCTION, MAINTENANCE, AND MISUSE

Design defects, construction defects, and a lack of maintenance can cause cracking or even collapse during normal operation. Misuse of the structure can also lead to collapse.

What we do: Our experts collect and process evidence, while using detailed analytical modeling of failure scenarios to determine the root cause.



IMPACT OR EXPLOSION

The effects of both impact and explosion on a concrete structure are complex. These effects can manifest damage to not only the concrete surface but also deeper within the structure, such as at the bond of the concrete with steel reinforcement.

What we do: Envista uses current research and standards to calculate the magnitude of force on the structure, coupled with dynamic modeling scenarios, to predict the locations and extent of damage, and then employs tests to verify and confirm this.

HEAT/FIRE

Concrete cannot actually burn, and cannot be set on fire. But that doesn't mean fires do not cause concrete damage—both visible and hidden.

What we do: Envista employs the most current testing techniques and technologies to identify the extent of such damage, whether the damage can be seen or not.



NATURAL DISASTER SUCH AS WIND, EARTHQUAKE OR STORM SURGE

Having detailed knowledge of the forces and effects of high wind, earthquakes, and storm surges on concrete structures is critical to properly predicting the potential damage from these forces.

What we do: Envista's engineers are well versed on the design and detailing requirements for such forces and conditions, and can correctly identify the extent of damage and the root cause, whether from a natural disaster or from a pre-existing condition.



SERVICES

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- Civil Grading and Utilities

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For over 25 years, Envista Forensics has been at the forefront of servicing the insurance industry, legal professionals and corporations successfully assisting clients, understand the cause of loss and determining responsibility following all types of equipment failures.

With extensive operations across North America, Latin America, EMEA and Asia-Pacific, Envista Forensics is uniquely positioned to deliver scientific expertise and court presentation experience to their clients, no matter where in the world these services are required.



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