



BUILDING FOR LIFE

ASSESSMENT • REPAIR • STRENGTHENING • MAINTENANCE

INSPECTION OF CABLE-SUPPORTED STRUCTURES

Cable-stayed bridges, arch bridges, suspension bridges, and suspended roofs are structures that rely on high-tensile steel cables to ensure stability and safety. These cables can be damaged by corrosion, fatigue, vibrations, mechanical impact, fire, or other external factors. Regular inspections are essential to maintain performance and detect damage early.

UNDERSTANDING STAY-CABLE PATHOLOGY AND KEY COMPONENTS AT RISKS



WIRES & STRANDS

High-tensile steel is highly sensitive to corrosion, caused by water, oxygen, chlorides, hydrogen embrittlement, stress corrosion, or fatigue. Detecting damage early is challenging due to the complexity of the structure, and any delay can result in accelerated corrosion and costly repairs. Monitoring cable loads is vital for safety.

STAY PIPES

Stay cable pipes protect the internal strands from environmental damage. Regular inspections should look for signs of wear, cracking, or perforation. Proper sealing of joints and connections is also critical to preventing the ingress of harmful substances.

Stay cables are critical for both structural performance and safety. While the steel wires, which bear the load, are the primary focus of inspections, several other components play vital roles in protecting and supporting them. Addressing deterioration early ensures the integrity of the entire system and reduces long-term repair costs.

ANCHORAGES

Anchorages, which consist of wedges, strands, anchor heads, bearing plates, and caps, protect the stay cables at their ends and transfer the force to the supporting structure. Inspections should assess these metallic elements for corrosion and check the condition of the protective filler of the strands. Maintaining the integrity of this area is crucial for long-term durability.

DAMPERS

Dampers help control vibrations and oscillations in stay cables, enhancing both structural stability and lifespan. Inspections should check for wear, corrosion, and mechanical integrity to ensure dampers remain fully functional.



MAINTAINING STAY CABLE INTEGRITY:

A RANGE OF SPECIALIST INSPECTION TECHNIQUES

VSL has a wide global presence with local agencies ready to assist you with routine inspections as well as exceptional inspections following an accident or damage. Our extensive expertise in construction systems and technologies, combined with in-house design and manufacturing of stay cable components, makes us a trusted partner for preventive maintenance, repairs, and upgrades.

VISUAL INSPECTION

Our experts inspect anchors, anti-vandalism pipes, and dampers, to identify early signs of deterioration with the support of drones or other advanced technologies.

STAY PIPE INSPECTION ROBOT

Our self-propelled robot, equipped with a proprietary AI algorithm, inspects the entire free length of stay cable pipes at an average speed of 6 m/min. It accurately detects and classifies defects, enabling early interventions.

MAGNETIC FLUX INSPECTION

This technique detects wire breaks or wire corrosion damage. This is particularly useful for grouted stays, locked-coil, spiral strand and parallel wire systems.

ENDOSCOPIC INSPECTION

Assessing the condition of strands behind the anchorage can be challenging. However, this technique becomes essential when water is detected in the area, enabling effective inspection.

ULTRASONIC METHODS

We use ultrasound to examine the condition of wires inside the anchorage zone. This allows to detect breaks or corrosion damage. Detection thresholds depend on anchorage detailing and wire condition behind the anchorage.

VSL'S VIBRATEST TECHNOLOGY

Our technology measures vibrations and evaluates forces in each stay cable, providing insights into the cable condition, actual force and overall structure behavior.

ACOUSTIC EMISSION MONITORING

This technique provides real-time monitoring and detection of potential wire or strand breaks, addressing any concerns about the integrity of stay cables once some initial damage has occurred.

COMPREHENSIVE REPORTS

We deliver reports of on-site inspection findings and post-processed data, including recommendations for further inspection or maintenance, using customized digital tools and workflows.

VSL, YOUR TRUSTED PARTNER

QUALITY, SAFETY AND SUSTAINABILITY

Quality, safety, and environmental responsibility are at the core of VSL's methods. We are committed to low-carbon solutions and strongly believe preserving bridges is the best way to minimize the carbon footprint of our infrastructure.

IN-HOUSE TECHNOLOGIES

VSL develops proprietary products and manufactures them in its own factories, carefully selecting designs and materials that meet the highest standards of durability.

ASSESSMENT REPAIR STRENGTHENING MAINTENANCE

BESPOKE DESIGN

VSL's technical department specializes in the analysis and design of custom solutions, developing innovative approaches tailored to your project.

EXECUTION BY VSL-TRAINED TEAMS

VSL's in-house training ensures flawless project delivery. Our skilled local teams handle each project with precision, consistently providing top-quality results.

POST- COMPLETION

Our commitment extends beyond project completion. We provide ongoing support to ensure that performance, safety, and the structure's useful life continue to meet our original standards through regular monitoring.

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PROJECT!



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