



PROJECT CASE STUDY

Integrated Stay Cable and SHM Solution for a Landmark Infrastructure Project

- ▶ 644m long cable-stayed bridge in Satu Mare, Romania.
- ▶ 56 stay cables in harp arrangement supporting 18,000+ tons.
- ▶ 98 Monitoring sensors continuously measuring critical structure data.
- ▶ Integrated Structural Health Monitoring.

How we helped our customer

Summary

The Transilvania Bridge in Satu Mare represents the city's largest infrastructure investment in more than 40 years and is one of the most significant infrastructure developments in Northern Romania. Delivered through close collaboration between STRABAG, the bridge designer, and DYWIDAG, the project has created a new landmark crossing while helping to alleviate inner-city traffic congestion and preserve natural floodplain areas.

As the trusted supplier of both the stay cable system and an integrated Structural Health Monitoring (SHM) solution, DYWIDAG played a key role in ensuring the bridge's long-term safety, performance, and durability.

- **Location** Satu Mare, Romania
- **Owner** Satu Mare Municipality Town Hall
- **Partners** Contractors: STRABAG – ARL Cluj
Consultant: MV Consult SRL
- **Products & Services** Design, Supply & Installation services
Stay Cable System
SHM System: Single strand load cells, Bridge monitoring system (BMS) Vibrating Wire Strain Gauges, Tiltmeters, Laser Distance Sesnors, GNSS Monitoring Stations, Data Acquisition System.

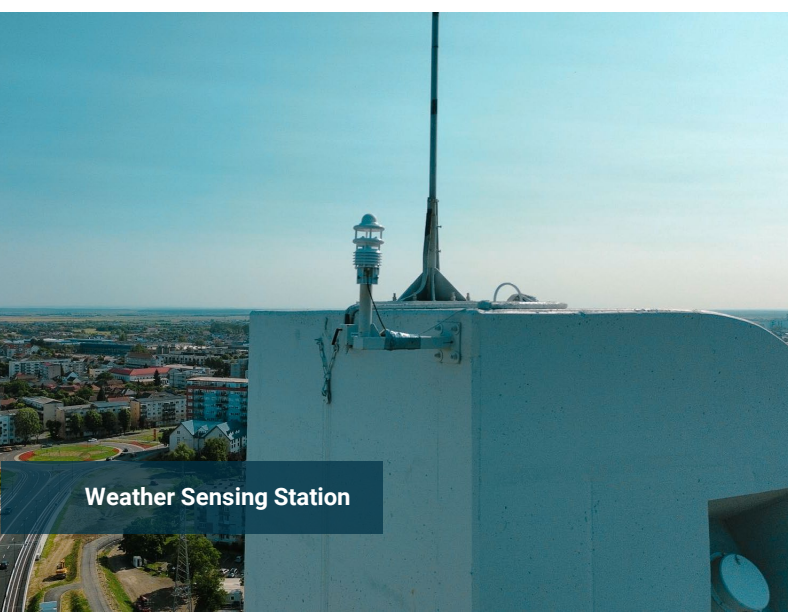
Project wins

Reduced Project Complexity: Integrated cable and monitoring systems from a single supplier.

Smarter Asset Management: Real-time data enables informed operational decisions.

Enhanced Infrastructure Safety: Continuous monitoring provides ongoing visibility into structural performance.

Protected Infrastructure Investment: Long-term monitoring supports performance throughout the bridge lifecycle.



Weather Sensing Station



GNSS Monitoring Station

The Challenge

The project required the integration of a sophisticated monitoring system within a complex cable-stayed bridge structure. Installation presented several challenges, including:

- Tight scheduling windows for pylon access
- Difficult access to segmental girders
- Precise sensor installation and calibration requirements
- Coordination between multiple project stakeholders

The DYWIDAG Solution

Combining expertise in both stay cable technology and bridge monitoring, DYWIDAG delivered a fully integrated Structural Health Monitoring solution designed to provide continuous insight into the bridge's behaviour from the start of service.

Structural Health Monitoring System

The system includes:

- 24 single-strand load cells
- 48 vibrating wire strain gauges
- 16 tiltmeters
- 4 laser distance sensors
- 6 GNSS stations
- Complete data acquisition system

The monitoring system continuously measures :Strain Displacement Settlement Cable forces Deck movement Vibration Weather conditions. To ensure efficient installation and long-term reliability, DYWIDAG implemented strategic collaboration with STRABAG and the bridge designer, detailed planning of sensor layout, routing, and calibration, a modular, plug-and-play monitoring system architecture and specialist expertise in stay cable installation and bridge monitoring



The Result

The result is a high-performance cable-stayed bridge with embedded monitoring capabilities, delivered on schedule and designed for long-term service.

By providing continuous measurement of key structural parameters, the DYWIDAG Bridge Monitoring System delivers valuable insight into the bridge's condition throughout its life cycle. The system provides real-time threshold-based alerting and automated reporting, enabling performance monitoring and supporting informed operational decision-making.

For asset owners and operators, the monitoring solution enables: Predictive maintenance strategies, Reduced lifecycle costs, Improved safety, Support for regulatory compliance, Data-driven operational decisions, and Long-term protection of infrastructure investment.

Long-Term Value

The Transilvania Bridge demonstrates how integrated stay cable and structural monitoring solutions can be incorporated from day one to support both construction and long-term operation. Through the combination of advanced cable technology and continuous performance monitoring, DYWIDAG helped deliver a landmark structure built for lasting performance and smarter infrastructure management.



Creating safer, stronger, and smarter structures

Want to know more?

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