The Fred Hartman Bridge is a twin-deck cable-stayed bridge spanning the Houston Ship Channel in Texas. Geocomp worked with Texas Department of Transportation to determine the dynamic behavior of the bridge and to establish the baseline performance of deck, stay cables, and towers.

S-lynks wireless sensing system was deployed on the bridge and the data collection was completed under normal traffic and ambient conditions and without the need for external excitation sources. A key aspect of utilizing the S-lynks system is the ability to process the collected data simultaneously with the test and provide results to get immediate insight into the structure’s dynamic behavior. Geocomp provided the complete dynamic characterization of the deck and towers including the torsional motion that is critical in terms of wind performance.

In addition, the estimation of stay cable forces, stay cable damper performance, and the interaction between stay cables and deck, plus other areas for further investigation were reported. The installation of the S-lynks system allowed for faster and more accurate results in a short window of time. Texas Department of Transportation has since decided to expand this program to get further information about the behavior of both of the structures and the cable tension.
Wind energy plays a major role in the mix of energy sources in the US. There are big plans for new wind projects being developed. One exciting opportunity for growth involves upgrading older wind farms, where some parts of the existing turbines are reused while adding new blades, turbines, or electrical equipment to increase the energy output of a wind farm.

As we think about using larger blades on older turbine structures, there’s a challenge to address. These new turbines exert larger forces on the structure, both lateral and vertical. To minimize costs, owners would prefer to keep the original foundation and support structure. However, this also means these components need to be used longer than they were originally designed for and with a larger magnitude of stress given the larger blades. How can we figure out whether the foundation and structure can handle these extra forces for a much longer time? This is a complex question that Geocomp has been assisting clients with in multiple ways:

**Subgrade and foundation evaluations.** Our team has substantial experience in site characterization and foundation analyses; we assess the performance of foundations both for static and dynamic loads. Our team has knowledge of advanced soil behavior, using state-of-the-art finite element tools and providing practical insights for foundation performance and foundation upgrades.

**Wind turbine instrumentation and structural performance monitoring.** Our experts have instrumented multiple wind turbines with specialized instruments. We have measured rotation, tilt, settlements, acceleration, and other performance measures. Our in-house proprietary best practices mitigate signal interference, measurement noise, and provide reliable and actionable data even from remote locations. All our performance measurements can be streamed in real-time, using our advanced iSiteCentral® web platform.

**Fatigue life assessment and digital twin.** Our cutting-edge fatigue life assessment uses digital twin solutions for wind turbines. Once a digital twin is developed, one can use advanced analytics and simulation techniques to meticulously forecast and optimize the lifespan of critical components. Our innovative approach not only enhances operational efficiency but also minimizes downtime, reducing maintenance costs and maximizing energy output. Our solution provides the future of wind turbine management – where real-time insights and virtual replication converge to drive sustainable success.

Geocomp has been performing these services across the country, as the trusted advisor of high-profile developers. We also work with certifying bodies to provide a certification of such work as needed to wind farm owners.
New Product Releases

**Constant Normal Stiffness (CNS)**

Geocomp’s ShearTrac-II and ShearTrac-III static and cyclic shear testing systems can now conduct Constant Normal Stiffness (CNS) tests with optional add-ons. The desired normal stiffness is automatically maintained, which is entered in stress or displacement format throughout shearing (example: kPa/mm or PSI/in). CNS is the preferred method to investigate mechanical behavior of an interface when normal stress doesn’t remain constant during shearing. An example would be the interface of a pile socketed into rock or grouted into the ground. Customers are able to add CNS or CCNS software to existing systems or purchase as a complete new unit.

**Triaxial Chambers with Submersible Load Cells & Other Internal Sensor Options**

We are now offering new standard and high-pressure triaxial chambers that allow use of internal, submersible load cells. Using submersible load cells eliminates the potential effects of piston friction (without correction) during a triaxial test and allows for higher quality results. This is particularly important for sensitive soil samples and tests like Critical State Line (CSL). Other sensors available include radial & axial displacement transducers, P&S wave measurement (bender elements), and resistivity measurement. These are great product additions to take your static and cyclic triaxial testing to the next level!

For pricing or further details, email us at products@geocomp.com

Visit Geocomp/GTX at Upcoming Events

*ASDSO Dam Safety Conference - Palm Springs, CA ~ September 17th*

*Geo-CT - Rocky Hills, CT ~ September 22nd*

*Railway Interchange - Indianapolis, IN ~ October 1st*

*GeoSaskatoon - Saskatoon, Canada ~ October 1st*

*Offshore Wind Power Conference - Boston, MA ~ October 3rd*

*Midwest Bridge Preservation Partnership (MWBP) - Deadwood, SD ~ October 17th*

*DFI Annual Conference on Deep Foundations - Seattle, WA ~ October 31st*