Structural Evaluations:
Providing Respected Analyses Across A Broad Spectrum of Disciplines

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Freese and Nichols, Inc.  
(FNI) was founded in 1894 in Fort Worth as one of the first independent consulting engineering firms in Texas. From those humble beginnings, we have grown to establish 13 offices throughout the state and have developed an accomplished staff dedicated to the same vision:  
**Be the firm of choice for clients and employees.**  
With nearly 500 employees in Texas, we have evolved through the years to the multi-disciplined architecture, planning, engineering, environmental science and construction services firm we are today.

**Experienced Team**

Our structural department is integral to the broad range of services provided by FNI, and the industry experience of its members exceeds 130 years combined. We have been providing professional structural evaluations since before structural engineering was designated a specialty.

Providing structural design support for a wide variety of engineering needs – from building design, bridges and dams to industrial facilities, energy and transportation – requires that we maintain capabilities in the design of a wide range of construction types. Steel, concrete, wood and aluminum are all materials that our structural team is regularly called upon to analyze.

**Customized Testing**

Depending on our clients’ needs, structural evaluations can range from visual examinations assessing quality to advanced quantitative structural analyses using finite element methods (FEM) based on observations and material testing. Non-destructive testing (NDT) is often needed to evaluate material properties or structural configurations not apparent by visual observation. FNI has been called upon many times to employ NDT methods, such as ultra-sonic testing, x-ray, ground-penetrating radar and concrete coring. Given the wide variety of structure types, FNI is accustomed to using a diverse assortment of specialized tools to collect necessary information, including video cameras, SCUBA divers, robots, cranes and rope-climbers.

Many assessments are dedicated projects with a sole purpose of determining the structural condition of the facility. Quite often aging buildings are evaluated to determine the remaining useful life or the ability to safely carry a certain load. Similarly, bridges are typically required to undergo periodic inspections to identify deterioration. FNI has performed numerous such assessments for highway, aircraft and industrial bridges.

Years of storing de-icing salt for roads and bridges under this City of Dallas bridge had caused heavy deterioration of the concrete columns. The steel reinforcement was severely corroded and had expanded to the extent that the concrete was breaking off. FNI developed repair options ranging from patch and repair to full section replacement. All concrete was recommended to receive a penetrating rust inhibitor.
Structural Assessments

It is common in the water and waste-water treatment industry to obtain a structural assessment of a facility’s infrastructure prior to a system upgrade. For treatment plants, damage is typically chemical in nature due to contamination by chemicals and gases necessarily associated with the process. Structures exposed to the flow of raw sewage are often susceptible to the aggressive attack of hydrogen sulfide gas. FNI is often called upon to assess the structural condition of steel or concrete storage tanks, either above or below ground, to recommend remedial actions.

On occasion, FNI utilizes microbiological testing, pH testing and examination of chemical exposure to structures. By using available technologies to get to the root of the problem, clients are able to take corrective steps to remediate the source of the situation and minimize future structural decline.

Moisture Control Study - Lockheed-Martin Aeronautics

FNI was engaged by Lockheed-Martin Aeronautics to investigate the existing conditions within one of its aircraft paint facilities. The water problems originated at the mezzanine level, which houses the air handling units that provide air conditioning for the facility, makeup for the paint booth exhaust systems and heating for the painted-parts bake cycle. The water was percolating down through the mezzanine and into other areas of the building. The leakage had damaged structural steel and concrete elements of the building, as well as the equipment. The recommended remedial options included mezzanine floor repair, mezzanine floor sealing, repair of leaking mechanical components and modifications to the mechanical systems.

Modlin Parking Garage Improvements - University of North Texas

This facility was originally built for the former Texas Osteopathic Medical School before being purchased by the University of North Texas Health Science Center. It sat unused for approximately six years and was in a general state of disrepair. The owner was under a tight deadline to get the facilities operational prior to the grand opening of a new building, which this parking garage would serve. FNI provided a comprehensive evaluation of the facility, including architectural, handicap accessibility, structural, plumbing and electrical disciplines. FNI was able to provide the evaluation and a subsequent repair package on an accelerated schedule, meeting the owner’s deadline. The repair package focused primarily on steel corrosion damage and concrete spalling due to water infiltration.
Understanding Our Clients’ Unique Needs

We understand that business must go on, regardless of a need to evaluate and analyze facilities. FNI diligently works at finding creative solutions to minimize any impact on clients’ businesses. It is in these types of circumstances that our broad range of experience becomes advantageous to our clients.

For example, FNI was called upon by the Texas Utilities Generating Company to evaluate a deteriorating timber bridge (see below). This private bridge was the only access to a small island where a conference center was located. FNI investigated the support system and recommended repairing and strengthening the six most deteriorated timbers using a fiberglass/epoxy composite wrap system. The repairs took about one week to complete, and the bridge remained open to traffic.

In another case, FNI was asked to evaluate a 2-million-gallon city water tank at Lockheed-Martin Aeronautics. Recognizing the importance of leaving a city water tank online, FNI performed its investigation with the concrete tank full of water by working with a certified underwater tank inspection company that used self-contained underwater breathing apparatus (SCUBA) gear.

Bringing Value to Our Clients

Confronted with aging infrastructure and shrinking budgets, many organizations work proactively to prioritize system renewal with a risk-based approach. FNI helps clients act as stewards of their facilities and their budgets by providing fiscally responsible rehabilitation options. We deliver services that help our clients fulfill their missions in these ways:

- Focus on project objectives
- Develop strategies to meet current and anticipate future needs
- Provide quality, timely advice
- Build mutual trust
- Set priorities to meet client needs

Customer service is a top priority for FNI, and it is our attention to meeting clients’ needs that has resulted in a high percentage of our current workload coming from repeat clients.

Freese and Nichols is pleased to count these respected institutions among our clients

City of Beaumont
City of Dallas
City of Fort Worth
City of Irving
City of Killeen
D/FW International Airport
General Services Administration
Lockheed-Martin Aeronautics
Texas Building and Procurement Commission
Texas Parks and Wildlife
Texas Utilities Generating Company
Trinity River Authority
University of North Texas
Our Guiding Principles
We are ethical
We deliver quality
We are responsive
We add value
We improve continuously
We are innovative
We develop professionally
We respect others
We give back to our communities

Our Client Commitment
Freese and Nichols’ commitment to client service led to our receipt of the 2010 Malcolm Baldrige National Quality Award recognizing excellence in leadership and customer focus.

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