Hampton Road Bridge Assessment and Repair (DPW12137)
City of Dallas, Public Works and Transportation

- Storage of de-icing salt under the bridge had caused severe damage
- Steel reinforcement in the concrete columns was severely corroded
- Expanding of the steel had caused concrete covering to spall off
- Freese and Nichols, Inc. (FNI) developed repair options ranging from patch and repair to full section replacement
- All concrete was recommended to receive a penetrating rust inhibitor

Aircraft Paint Facility Moisture Control Study (LMT03377)
Lockheed-Martin Aeronautics

- Water was percolating down through the mezzanine level and into other areas of the building
- FNI investigated the existing conditions to determine the source of the problem
- Problems were associated with the area that housed 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
- Water had damaged structural steel and concrete elements of the building, as well as the equipment
- FNI recommended remedial options, including mezzanine floor repair and sealing, repair of leaking mechanical components and mechanical systems modifications

Modlin Parking Garage Improvements (UNT09362)
University of North Texas Health Science Center

- Parking facility sat unused for about six years during a change in ownership and was in a general state of disrepair
- Owner needed to get the facilities operational on an accelerated schedule, due to the grand opening of a neighboring building, which this facility would serve
- FNI provided a comprehensive evaluation of the facility, including architectural, handicap accessibility, structural, plumbing and electrical disciplines.
- FNI provided the evaluation and subsequent repair package on an accelerated schedule, meeting the owner’s timetable
- Repairs focused primarily on steel corrosion damage and concrete spalling due to water infiltration

Waste Transfer Station Fire Damage Evaluation (KIL11303)
City of Killeen

- City of Killeen’s waste transfer station was damaged in a fire
- FNI was called in to evaluate structural and electrical component conditions
- FNI observed considerable damage in the building lateral system
- Evaluation included structural analysis of the lateral system in the damaged condition to minimize the extent of the required repairs
- FNI provided design of various structural repairs associated with the fire damage, as well as several facility upgrades not associated with the fire damage
Miscellaneous Bridge and Parking Garage Inspections (DFW06297)

D/FW International Airport

- FNI provided structural inspection, analysis and forensic engineering services for all bridges at DFW International Airport under a five-year indefinite delivery contract
- Rehabilitation, repair and safety improvements included BRINSAP inspections of more than 120 concrete and steel bridges and the design and inspection of their repairs
- FNI also provided inspection of 11 large multi-story parking garages at all of the terminals and at the rental car facility
- Evaluation included structural inspections, recommended repairs and cost estimates; long-term maintenance and monitoring recommendations were included

Coolant Return Troughs Upgrade (LMT04251)

Lockheed-Martin Aeronautics

- Approximately 1,100 linear feet of coolant troughs needed rehabilitation
- Troughs moved fresh coolant to milling machines via pressurized piping and returned used coolant and cutting chips back to the central coolant collection system via open-channel flow
- The troughs’ steel liner was badly corroded in some locations, which allowed coolant to leak through defects in the concrete structure and into the soil below
- Primary objective was to replace/repair the steel liner troughs in areas where corrosion undermined the liner’s integrity
- FNI documented site conditions and advised abandoning piping within the troughs
- FNI teamed with a corrosion subconsultant and determined that an acid-producing and sulfate reducing bacteria were present in the slime within the troughs, which contributed to a dramatic increase in the rate of corrosion
- To prevent corrosion, the team recommended the use of carbon steel sides coated with a coating designed to resist microbiological attack

Hackberry and Northgate Pump Station Improvements (IRV09281)

City of Irving

- Pump station was experiencing significant structural and mechanical problems shortly after construction
- FNI performed a multidiscipline site inspection and design review of the facility
- Movement associated with the very expansive soils at this site was determined to be the cause
- FNI provided recommendations for modifications to mitigate the distress due to the soil movements

Parking Garage J Structural Repair (TBC02354)

Texas Building and Procurement Commission

- Parking garage was damaged due to water infiltration and inadequate coating maintenance
- Rain, as well as underground water at the below-grade walls, was cause of the water infiltration
- FNI performed an assessment of all of the structural components
- Improvements were made to the below-grade water barrier
- Corrosion-damaged steel floor framing supports were replaced with a continuous concrete ledge
Concrete Ramp Repairs, Federal Parking Garage G in Fort Worth, Texas (GSA02200)
General Services Administration
- Parking garage had undergone deterioration primarily due to water infiltration and de-icing salt application
- FNI performed site investigations to assess the extent of the damage
- Based on this assessment repair, recommendations and construction cost estimates were produced

Solids Dewatering Improvements at Central Plant, Grand Prairie, Texas (TRA98331)
Trinity River Authority
- Concrete beams, slabs and columns had suffered extensive damage due to chemical attack at the belt press structure in the Solids Dewatering Building
- FNI was engaged to prepare a conditions assessment
- It was determined that waste spilling from the belt presses, which compress the sludge product, caused damage to the supporting structure
- In addition, cleaning products used at the facility had also caused structural damage
- FNI prepared plans to mitigate the structural damage

Lake Creek SES – Structural Investigation of Bridge near Waco, Texas (TUG96473)
Texas Utilities Generating Company
- TU sought recommendations on how to keep a 76-foot-long by 14-foot-wide simple trestle bridge with deteriorating support piles in service
- FNI conducted a detailed structural investigation and produced a report, which included a bridge description, evaluation, three recommendations for repair/replacement, an opinion of probable construction cost and detailed repair drawings
- 12 timber piles had different degrees of deterioration, with one showing as much as a 50-60% loss of section
- FNI advised repairing/strengthening the most deteriorated piles using a fiberglass/epoxy composite wrap system developed by Delta Pavement Technology, Inc.
- A standard glass wrap system was used out of the water and a carbon wrap system was used below the water
- FNI made one site visit during the construction repair phase as the owner’s representative
- Repairs took about one week to complete, and the bridge remained open to traffic

2-Million-Gallon City Water Tank Rehabilitation and Pipeline Reroute (LMT01495)
Lockheed-Martin Aeronautics
- FNI performed a site investigation and provided a report of the interior condition of a 2-million-gallon city water tank located at Air Force Plant #4 for Lockheed-Martin Aeronautics Company in Fort Worth, Texas
- FNI engaged a certified underwater tank inspection company to perform the investigation underwater by using self-contained underwater breathing apparatus
- Cracks and pipe connections were examined for leakage through the release of colored dye
- A report was prepared of the tank interior condition, which included recommendations for repair and associated costs
- FNI prepared construction documents for the accepted tank repair recommendations
Texas Parks and Wildlife Department

- Walls of a large public display fish tank at the Freshwater Fisheries Center were leaning and settling by up to four inches
- FNI performed a forensic geotechnical and structural investigation to determine the cause and solutions
- FNI designed the tank repairs using vertical and angled compaction grout columns under the tank
- The floor slab around the tank was mudjacked to raise and level the slab
- In addition, repairs were made to the fiber-reinforced plastic grating walkway and supports

Surface Water Treatment Plant Improvements – Phase I (BMT05253)

City of Beaumont

- Upgrades to a chemical feed facility at the water treatment plant required rehabilitation of the chemical feed and chlorine storage building
- Repairs were made to the building’s concrete floor slab, which had exhibited deterioration due to leakage
- Three large existing pulsator structures were also rehabilitated due to extensive concrete deterioration caused by the water’s pH level
- A high-performance protective coating was applied on all wetted concrete surfaces in the pulsator structures
- Concrete repair and rehabilitation included surface preparation, pressure injecting cracks with high strength epoxy adhesive, applying high strength repair mortar to level the substrate and repair spalled areas, and applying an epoxy protective coating
- Two test sections using different manufacturer’s products were put in place on the pulsator walls early in the design phase, enabling the owner to select the best-performing material

Rolling Hills Water Treatment Plant Phase 5 Chemical Facilities Improvements (CMD00507)

City of Fort Worth

- The City sought to convert an existing dry chemical storage structure that was not in use into a new chemical feed building and a new dry chemical storage area
- FNI performed a site investigation and researched existing construction drawings to determine if converting the existing dry chemical storage structure to an enclosed chemical feed building was possible
- A concrete pan joist system was used for the roof of the new building; existing concrete walls supported the new concrete roof
- Areas of the existing concrete slab within the new chemical feed building were repaired due to deterioration, and existing metal stairs and platforms were replaced due to corrosion
- In the existing dry chemical storage area, which is in use, a concrete pipe trench needed concrete and grating support repairs due to deterioration and corrosion
- Modifications were also made to the existing chemical building