



SERVICE PROFILE

Bridge Engineering

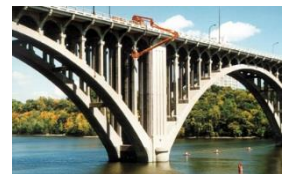


- Structural evaluation and load rating
- Fatigue and fracture studies
- Failure investigation
- Corrosion protection and durability studies
- Repair and rehabilitation design
- New construction and repair design services for movable bridges
- Balance testing and analysis
- Safety inspection and nondestructive testing
- Seismic evaluation and retrofit design
- Instrumentation and field testing
- Mechanical, electrical, and hydraulic services

Bridge structures are subject to harsh conditions and require ongoing maintenance and rehabilitation to achieve long-term performance. Through the investigation of thousands of bridges and notable bridge failures, our bridge engineers have learned that improved bridge construction and rehabilitation designs are accomplished through a better understanding of the problems. Our knowledge of bridge performance is supported by expertise in structural, electrical, and mechanical engineering as well as laboratory and field testing and instrumentation.

Our bridge engineers have extensive experience conducting field investigations of bridge deck, superstructure, and substructure problems involving a wide range of bridge materials and structure types. In addition to traditional highway and rail bridges, we have special expertise in heavy movable structures, including bascule, swing, and vertical lift bridges.

Supported by extensive laboratory facilities, nondestructive testing capabilities, and in-house expertise in our Janney Technical Center, we are routinely called upon to complete fatigue and fracture investigations, corrosion assessments, and collapse investigations. Our engineers are also experts in the design of new movable bridge systems, shop and field inspection, preparation of procedures for machinery installation, and electrical testing and construction support services.





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REPRESENTATIVE PROJECTS

- 92nd Street Bascule Bridge - Chicago, IL: Balance calculations and recommendations for interim pinion replacement
- BNSF Bridge 253.89 - Davenport, IA: Complete replacement of end lift machinery following failure of original system
- I-35W Mississippi River Bridge - Minneapolis, MN: Collapse investigation
- I-435 Missouri River Bridge - Kansas City, MO: Fracture critical examination, instrumentation, and retrofit
- IH-345 - Dallas, TX: Comprehensive condition assessment and finite element analysis
- Leonard P. Zakim Bunker Hill Memorial Bridge - Boston, MA: Peer review and safety assessment
- Liberty Bridge - Pittsburgh, PA: Fire damage investigation and repair
- Logan Creek Bridge - Glacier National Park, MT: Historic preservation study and repair design
- Mississippi Department of Transportation - Jackson, MS: Timber bridge inspections
- Oahu Bridges - Oahu, HI: Post-tensioning inspection and appraisal
- Statewide Bridge Study - CA: Inspection of 120 bridges and recommendations to mitigate alkali-silica reaction problems
- Woodrow Wilson Memorial Bridge - Alexandria, VA, and Oxon Hill, MD: New design services for construction of quadruple-double leaf trunnion bascule bridge

