

AWARD OF MERIT

PARKING STRUCTURES CATEGORY

Dallas City Hall Plaza Parking Garage Repairs

DALLAS, TEXAS

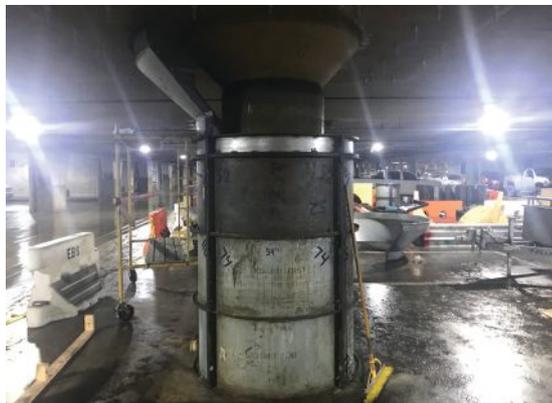
SUBMITTED BY JQ ENGINEERING, LLP

assessment was ordered for the two-level, 600,000 sq below-grade parking structure serving Dallas City Hall.

Repairs were developed to strengthen the existing slab and supporting columns and to repair cracking and delaminations in the slab and columns caused by the significantly overloaded conditions. Sequencing of the repair work was also incorporated into the design to allow for the continued operation of the parking structure as it is the sole available space for City Hall staff parking. This project and the techniques used for evaluation have provided the basis for several continuing educational courses presented to engineers across the nation.

The finished, repaired, and improved Dallas City Hall Plaza Parking Garage serves a vital role. Providing ample parking for employees of City Hall, the underground garage keeps the beautiful plaza available for pedestrian, event, and citizen use. Through thoughtful and cost-effective design and thorough testing before and throughout construction, the city can rest assured that the garage is secure for use for decades to come.

The Dallas City Hall Parking Garage sits under a large, landscaped plaza in front of an iconic I. M. Pei-designed building. The garage structure consists of bonded post-tensioned flat slabs with unreinforced drop panels supported by conventionally reinforced circular columns with conically flared capitals. The upper slab of the garage is sloped and stepped to promote drainage and address changes in surface amenities. This also results in significant variations in soil fill depths as the upper topography also varies greatly. The parking structure is overlain by two city streets and various site amenities including multiple mature trees, emergency access fire lanes, assembly areas, sculptures, and a pool with fountains. The varying depths of soil and diverse site features create large variations in the loading imposed on the garage. Based on the failure of a large section of a drop panel which became detached unexpectedly, a structural



Dallas City Hall Plaza Parking Garage Repairs

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AWARD OF MERIT

SPECIAL PROJECTS CATEGORY

Wichita Falls ISD Memorial Stadium Assessment and Repairs

WICHITA FALLS, TEXAS

SUBMITTED BY JQ ENGINEERING, LLP

After 50 years of exposure to Texas weather, the Wichita Falls Independent School District's Memorial Stadium needed major repair. The 14,500-seat stadium was constructed in the early 1970s with monolithic cast-in-place concrete treads, risers, and raker beams on concrete columns and shallow foundations. The original construction drawings provided by the District showed concrete sections and reinforcing in the structure. Over the years, water had penetrated the exposed concrete surfaces, rusted the reinforcing steel, and delaminated or spalled concrete cover in numerous locations in the elevated seating structure. Additionally, volume changes due to a wide range of Texas temperatures and expected movement of the shallow foundation system contributed to failures of spandrel beams. The District was concerned that the delaminated and spalling concrete would become a potential hazard to occupants of the stadium. As a result, the District ordered an assessment, which generated a report detailing recommended repairs.

Once the structure of the treads and risers had been repaired, cracks in the top surface of the treads and vertical faces of the risers were routed and sealed with a single-component urethane-based traffic use joint sealant. All cracks with widths greater than .0625 in (1.5875 mm) were addressed to be compatible with the



traffic coating. In addition to addressing cracking in the structure, all expansion joint materials were removed and replaced with new expansion joint seals in properly refinished and prepared joints. Spandrel beams on the ends of the seating structures had failed where the beams connected to concrete walls on the lower end of the slope. The repair required establishing a new expansion joint at the lower end of the spandrel beams to relieve thermal stresses and stresses caused by potential future foundation movements. The spandrel beams were shored, all cracked concrete was removed, reinforcing in the beams was reestablished, a new expansion joint was established between the beam and supporting wall, and the concrete was replaced. A new wall coating was applied over existing wall surfaces.

After completion of the structural repairs and application of new joint sealants and deck coating, the aging 50-year-old stadium has new life and can continue for many years to host sporting events for Wichita Falls Independent School District.



Wichita Falls ISD Memorial Stadium Assessment and Repairs

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