



PROJECT PROFILE

HSHS St. John's Hospital Parking Garage

Background

Springfield Illinois' St. John's Hospital, strategically located between St. Louis, MO and Chicago, IL is a critical health care provider to the region. The main building houses over 400 beds and a helicopter served Level 1 trauma center. To accommodate the daily flow of patients, personnel, and visitors, five parking structures service the sprawling medical complex. The hospital's main parking structure is located at 600 Carpenter Street. Not only is this the busiest parking garage, but the top deck also serves as the helipad for the incoming trauma patients. Due to the critical nature of the garage's 24-hour operation; repair and maintenance work are managed and executed very carefully and as quickly as safely possible

Challenge

Towards the end of the last decade, it became clear the garage was in need of major repair. Constructed of precast concrete (PCC) double tee beams, years of heavy traffic and de-icing salts had taken their toll on the structure. Most notably, the sealants and shear connections in almost every double tee joint had failed in some manner. The failure of the shear connections through corrosion and breakage was compromising the integrity and longevity of the garage. A repair strategy that would be fast and permanent was required.

In 2020, the hospital contracted with Hanson Professional Services, Inc of Springfield, IL, a regional engineering firm with specific expertise in PCC repair and restoration. Hanson performed a thorough evaluation of the structure and confirmed that most of the existing shear connections had failed. They also determined that due to increased loading, a significant number of additional connections would be required.

Solution

Traditional methods of repairing connections and adding additional shear capacity were ruled out due to cost and most importantly repair speed. Based on extensive industry experience, Hanson specified V2 Composites TBiscuits for the repair. T-Biscuits are specifically designed to replace existing shear connections at a 1:1 ratio. Manufactured from aerospace grade carbon fiber reinforced polymer, T-Biscuits are immune from corrosion and fatigue while still carrying all the required shear and tension loads developed in the deck of a PCC parking structure. Using standard construction tools and techniques, T-Biscuits are easy and fast to install with minimal down time to structures. The Hospital contracted with Western Specialty Contractors of Springfield, IL for a comprehensive repair using V2 T-biscuits. Hanson determined, two T-biscuits would be installed for each existing steel shear connector to restore the shear capacity of the structure and to eliminate the bouncing of the PCC double Tees as traffic moved about. A key component to this contract was to minimize down time and disruption to the helipad on the top deck.

Solution

Western took advantage of using whole bays of the garage to work in and were able to install over 100 T-biscuits a day, much faster than any alternate repair methodologies. Additionally, Western was able to quickly shut down the work area in the required 20-minute window for arrival of trauma patients by helicopter. Western installed over 4,000 V2 Composites T-biscuits as part of the rehabilitation of the garage all while never disrupting critical emergency services to the hospital.

V2 Products Used

4000 CFRT T-Biscuits & 200 Biscuit Bond kits

Installation Contractors

Western Specialty Contractors of Springfield, IL

Engineering Firm

Hanson Professional Services, Inc. of Springfield, IL



V2 Composites, Inc.

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