

CPR – REBUILT TO LAST

Salt Lake City Concrete Pavement Restoration

>>> PATCHING, DIAMOND GRINDING & JOINT RESEALING

LOCATED CLOSE TO DOWNTOWN Salt Lake City, Industrial Road at California Avenue needed some well deserved repair. Industrial Road is a critical concrete pavement thoroughfare for industrial traffic and heavy duty trucking in the area as it is located adjacent to a major truck stop and trucker fuel depot. The majority of the concrete pavement was structurally sound but, due in part to sub-grade softening caused by surface water intrusion through the joints, the pavement exhibited differential settlement between the slabs measuring up to 1.5-inches. The combination of constant heavy truck traffic and the presence of water in the sub-grade facilitated continued erosion beneath the slabs.

Although the owner, the Salt Lake City Corporation, considered replacing all concrete slabs. They opted instead to preserve the existing concrete. After all, only 10 percent of the slabs showed cracking. The methods chosen for repair were soil foundation stabilization, slabjacking, slab replacement, stitch-in-time crack repair, dowel bar retrofit (DBR), diamond grinding and joint resealing. A total of 326 dowels were retrofitted on the 1,461 square-yard project. A series of 5/8 inch holes were drilled through the slabs to facilitate the injection of high density expansive polymers into the sub-grade soil to a depth of 3.5 feet. With the deep injection process complete, the same polymers were then injected at the slab/sub-grade interface through the same 5/8-inch holes to fill fissures and voids as well as to lift each concrete slab to match the elevation of adjacent slabs. This process minimized the differential settlement between the slabs. Additional lifting was then employed beneath the slabs to create a 1.5 percent drainage slope from the crown of the road to the curb to facilitate better drainage and safety.

This design engineer decided to test an innovative new crack stitching procedure utilizing polyurethane material and fiberglass panels. The



Uretek Stitch-In-Time process was selected and used beneath five slabs that contained minor cracks. Following the slab stabilization and lifting operations, the Stitch-in-Time process required the placement of ½ inch fiberglass panels (stitches) within saw cuts made perpendicular to the slab crack. The cuts were then filled with clean pea gravel and an acrylic bonding material was poured into each cut. Four stitches were placed in each candidate slab.

Following the stabilization, lifting and stitching operations, the retrofit dowel bars were installed in the slabs, severely cracked slabs were removed and new concrete was placed in the necessary areas. Once the concrete was fully cured, the entire area was diamond ground to remove remaining surface defects, increase smoothness and provide a safe, high friction wearing surface. The joints between the slabs were then cleaned and resealed to prevent the intrusion of water and incompressible materials. As a final step, a sealing compound was applied to the concrete surface to provide additional protection.

Another challenge was slab cutting at the joints prior to the lifting process. The summer heat caused slab expansion, which can bind the saw blades and restrict a slab's upward movement. To prevent this occurrence, a chisel-shaped device was inserted into the saw cut adjacent to the trapped blade and pressure was applied to spread the cut sufficiently to allow the blade to be extracted.

TEAM MEMBERS

- Salt Lake City Corporation (Owner)
- Concrete Stabilization Technologies, Inc. (Prime contractor, slab stabilization, slabjacking, stitch-in time)
- SLC Engineering (Design engineer)
- Multiple Concrete Enterprises (Sub contractor, full depth repair, dowel bar retrofit, and diamond grinding)
- Utah Barricade (Traffic control and project signing)
- Geneva (Ready mix supplier)

The project was scheduled for 90 days but was completed in a mere 62 days and was under budget. As a result of this successful project, the owner has chosen to use concrete pavement preservation on future projects within the city. The combination of using high density expansive polymers in conjunction with other concrete pavement preservation techniques including dowel bar retrofit and diamond grinding should extend the life of this pavement for approximately 15-20 years.

According to Mike Kendell of SLC Engineering, "Ride quality was greatly improved and Salt Lake City is satisfied with the results."