RIGGING
$150,000
to
$750,000

OXBO MEGA TRANSPORT

Oxbo lifted and installed a 300-foot pedestrian bridge using two complicated lift and move systems.

Trestle wrestle

The new Grand Avenue Park Bridge in Everett, WA was a win-win situation for the Puget Sound-area community. The $20 million project involved the placement of new stormwater and sewer pipes that will prevent flooding, and the new truss is also a pedestrian bridge that provides convenient access from across Grand Avenue Park to the waterfront.

Oxbo Mega Transport Solutions was contracted to lift and install the 300-foot-long pedestrian bridge that weighs almost a million pounds. There were many challenges to installing the steel structure including an extremely tight jobsite with high voltage power lines, installation of the bridge over live Burlington Northern-Santa Fe Railroad tracks and ground conditions that required analysis and remediation. Other challenges included a nearby restaurant building in close proximity to the jobsite and the seawall location.

Placing the 500-ton bridge that is about the length of a football field in a harbor area required a comprehensive plan that started with ground and soil assessments to assure stable ground conditions for the stand jack lifting towers and the SPMT systems that would be used to position the bridge and lift it into place, on one end a foundation built into the hillside and the bridge tower support on the other end. Planning started in July of 2018 and the project was completed in October of 2019.

Ground stabilization included dredging and filling with road fill and fine-grained sand. The groundwater level also had to be assessed and recent rains delayed the start of the bridge installation for a couple of weeks. A cribbing system was designed to be placed under the four strand jack lifting towers. The cribbing system included steel plates, railroad ties and additional wooden cribbing. Ground contact pressure had to be assessed and monitored.

Oxbo's crew worked with the contractor team to develop a plan for picking up the bridge, loading it onto a sophisticated 176-tire SPMT system, moving it to the lifting towers where it would be lifted to a height of 36 feet, building a cribbing system on a reformatted SPMT system underneath the bridge, lashing the bridge back to the cribbing and SPMT system and then moving and rotating the bridge again to be installed on its foundation on either side of the roadway.

On the weekend before the move, Oxbo crews began constructing the cribbing and the strand jack lifting tower systems. Two beams between each set of towers were designed to hoist the bridge structure up to the designated height.

Complicated lashing

The SPMT was driven underneath the steel bridge that was sitting on jacks on the west side of the roadway. The truss was lashed to the transporter using lashing chain, shackles, turnbuckles and binders and nylon steel slings. The SPMT drove the transporter to the middle of the road so that the lift towers could be constructed. The lifting beams were placed between the two southern and northern towers. The SPMT then positioned the bridge between the two lift tower beams where it was lifted up 36 feet. The SPMT system below the bridge was then reconfigured and a lift stack cribbing system was built to support the lifted bridge.

The Goldhofer PST-SLE SPMT system was rigged with an Oxbo lift stack, or truss crib stack. Lift caps consisting of additional cribbing were at the top of the lift stack. The bridge was lashed to the top caps on the two-file SPMTs. Once the bridge was fully placed on the lift stack on the SPMT, the south strand jack tower was disassembled.

The bridge was then painstakingly rotated to a 90-degree angle to the highway, a very tedious process due to the tight jobsite conditions, power lines and the railroad below. There was also a restaurant building that needed to be avoided.

The SPMT system then continued the bridge's journey to the east, at last placing the eastern end of the bridge on its foundation that had been built into the hillside. It was then bolted and lashed to the foundation. Next, the southern end of the bridge was lifted and secured on the bridge tower.

Bearings that were built into the bottom of each bridge end section were slid and locked into place on the hillside location and on the bridge tower support. The truss was then bolted into place.

The project was firm fixed price and Oxbo was subcontracted to Interwest Construction. Oxbo subcontracted part of the equipment rental, engineering and labor to Nordholm Companies.

There were no recordable injuries or illnesses. ■