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Trio of Surgecretes Utilized in the Repair of Tampa Reservoir

Kiewit C.W. Bill Young Reservoir

Job Report

The C.W. Bill Young Regional Reservoir in Tampa, Florida first began operating in 2005. At 15.5 billion gallons the reservoir serves as an above-ground storage facility during the wet season. During the dry months, the reservoir is drawn down. Water is then sent to the regional treatment plant and distributed to 2.3 million people served by Tampa Bay Water. Soon after being constructed, large cracks (see below left) began to form in the facility's soil cement erosion control lining, eventually forming in over 70 percent of the interior face.

After extensive studies and numerous law suits it was determined that the old system had failed to allow water to drain from the soil wedge between the flat plate soil cement layer and the pvc membrane. When the reservoir was lowered the water in the soil wedge created a pressure difference between the layers and large cracks formed in the soil cement. Tampa Bay Water awarded a $129 million contract to Kiewit Infrastructure South Co to remove the existing liner, and install a new geomembrane, better engineered drainage system, and thicker soil cement.

Kiewit turned to Maxon Industries of Milwaukee, Wisconsin and RCC Conveyors (RCCC) of Volo, Illinois to provide an engineered system of equipment to assist in placing the new aggregate drainage system and the 700,000 yds^3 of soil cement that make up the new interior face of the reservoir. Maxon and RCCC supplied a specialized trailer mounted delivery system with a $15yd^3$ Maxon Surgecrete being towed by a 150' Crawler Placer conveyor system. In addition, Maxon custom built two Surgecrete hoppers mounted to two Gomaco 9500 placers to assist in placing the soil cement in the lower 25' of the reservoir walls.

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Material Delivery System Key to Rapid Placement

Kiewit, in collaboration with Maxon and RCCC, selected equipment that could not only rapidly place the new aggregate drainage layer, but also the stair-stepped soil cement layer. With goals of placing as much as 3,000 to 5,000 cubic yards of material per day, Kiewit needed units that had a large surge capacity to keep up with the soil cement production from the pugmills while continuosly placing the material on the slopped walls.

To place aggregate and soil cement on the high walls, Kiewit selected a RCCC Crawler Placer CP150 with a 150" triple telescoping boom towing a 15 cubic yard Maxon Surgecrete on a trailer around the inside perimeter of the reservoir. The trailer (from a previous Kiewit project) provided a perfect mobile platform on which to place the Surgecrete. The Surgecrete would then utilize its 36" x 25' conveyor to feed the Crawler Placer's 24" belt.

36" belt on the Surgecrete keeps production flying along at rates of over 3,000 yds^3 /day

Maxon Surgecrete

To reach the ambition placing rates the system needed to be able to keep pace with the twin soil cement pugmills. A continuous stream of 24 yard Cat Ejecto Bodies ran soil cement to the placing trailer (see page 4 for details on aggregate placement with the system). The Ejecto bodies discharged into a 8 yard Cat front end loader, that then dumped the soil cement into the Maxon Surgecrete. Kiewit estimated that the Maxon Surgecrete and the RCCC CP150 will place and travel nearly 500 miles before the project is complete.

Crawler Placer

(Right) The RCCC Crawler Placer CP150 includes a 150' long triple telescoping boom with a 24" belt system. Belt speeds of up to 900 ft. per minute provide for placing rates up to 10 cubic yards per minute. The RCCC CP150 incorporates a Caterpillar Excavator Chassis that allows the conveyor to move and place simultaneously. In the picture to the right, the RCCC CP150 feeds soil cement to the upper regions of the stair-stepped walls. A dozer with a front mount form box creates the slip formed 6"lifts. The soil cement is then compacted to create the interior face of the reservoir.

TAMPA RESERVOIR

Placing the Lower 20' of Soil Cement Layer

To place soil cement for the lower steps of the walls, Kiewit used two modified Gomaco 9500 placers. The existing hopper on the 9500's included a 12" screw designed to handle concrete. In initial trials with the 9500 placers the soil cement material would bridge in the hopper, slowing production.

Kiewit turned to Maxon yet again. In short order, Maxon engineered and delivered two custom low profile Surgecrete hoppers to replace the existing 9500 hoppers. These 12 cubic yard Surgecretes utilized Maxon's standard 24" diameter screw that provided a jam free solution for the 9500 placers. "We have not seen the bridging and repetitive stops (that we saw previously)", remarked Randall Starkey, equipment superintendent for Kiewit.

Surgecrete Fed Directly From Dump Trucks

To feed soil cement to the Maxon Surgecrete hopper on the 9500's, Cat dump trucks with Ejecto bodies backed slowly into place in front of Surgecrete hopper and the truck was placed in neutral. The Surgecrete Hopper on the 9500 was equipped with two push rods that allowed the 9500 to push the dump trucks while simultaneously placing soil cement to the lower portion of the stair-stepped walls. Once the Ejecto bodies on the dump truck were empty, the driver placed the truck back in drive and departed. At the end of each shift, the hydraulically operated door on the Surgecrete tailgate raised to assist in final cleanout of the hopper.

Above: Cat Ejecto Bodies feeds soil cement directly to low profile Surgecrete

Kiewit had a very tight placing window (maximum 90 minutes allowed from pugmill to placement to maintain proper moisture in the soil cement) the system needed to run extremely efficiently. When there would be lags from one truck to the next, the Surgecrete ensured a continuous stream of materials to the placer.

Left: Paving of the lower 20' of stair step soil cement was placed with two Gomaco 9500's, each equipped with a low profile Maxon Surgecrete. The Surgecretes are simultaneously loaded by the Cat dumps while discharging soil cement onto the 9500 placing conveyor. Similar to the crawler placer, the 9500 inched along continuously feeding the soil cement to the dozer forming the next lift.

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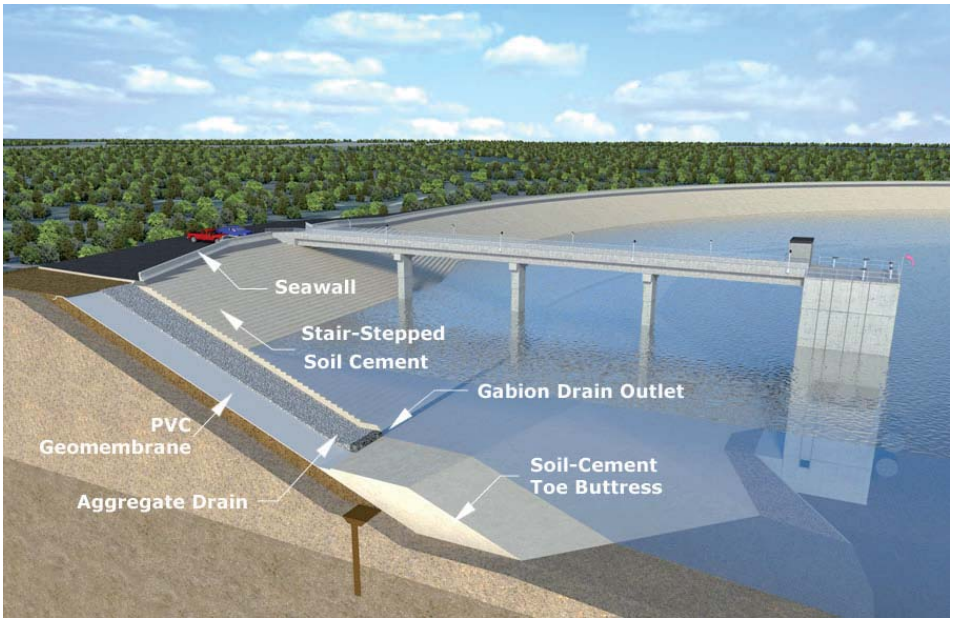
tampa reservoir

Aggregate Placing

Prior to placing the soil cement, Kiewit placed the aggregate/drainage layer on top of the new geomembrane. During warm days when the soil cement operation were idle, Kiewit utilized RCCC's Crawler Placer to place aggregate in the upper regions of the walls from down on the Reservoir floor.



Left: Drawing depicts the cross section of Kiewit's newly designed Reservoir walls. Kiewit's design includes new aggregate drainage layer that will alleviate the pressure the caused the cracks in the old Soil cement layer. Three Maxon Surgecretes were instrumental in rapid deliver of aggregate and stair-stepped soil cement layers around the 5 mile perimeter of the Reservoir.

To learn more about Maxon's complete line of concrete mixing/transportation and placing equipment, please visit our website at www.maxon.com or contact us directly at the numbers provided below.

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