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DIE WELIGRÖSST FÜR INTRANSST

Spotlight on Germany

Patent O LEEA O NA review

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iewit and Bilfinger-Berger entered into a joint venture as general contractors for a major sewage tunnel project in Oregon, called the East Side Confined Sewage Overflow (CSO). Their client was the City of Portland's Bureau of Environmental Services.

NAI supplied two double girder 10 US ton cranes and two 350ft long runways for use in a concrete precast plant where the tunnel pieces would be cast. The project involves building and installing underground piping approximately six miles long to reduce sewage and storm water overflows into the Willamette River in Portland, Oregon. It is a \$425 million dollar project that will not be completed until December 2011.

The tunnel will be dug with a large boring machine. Upon completion, the machine will place large concrete panels, called segments, around the diameter to form the tunnel. Eight panels form a circle, each segment weighs about 8,000lbs and Kiewit Bilfinger-Berger needed to manufacture 48,000 of them.

The cranes, which are used almost constantly in 10-hour shifts, had to be integrated with additional equipment in the concrete plant and below the hook devices. Time was limited, space was tight, and there were multiple major parties involved.

The first crane designed was for the right hand pouring/stripping bay where it was used for stripping precast concrete panels. The crane can lift up to 10 US tons and has a 58ft 4in span.

The second, also of 10 US ton capacity, but with 47ft span, was for



Tunnel vision

North American Industries (NAI) has supplied two custom-built cranes for the construction of piping for a major six-mile tunnel project designed to reduce overflows into Oregon's Willamette River, USA The runway system, the elevated structure on which the cranes travel, was customengineered and installed to work within the given dimensional constraints

the so-called prep bay, used to position the segments after they have been stripped from the moulds, while workers perform the next steps in the process such as gluing and gasketing.

The trolleys and end trucks were designed to Class E specifications, defined by the CMAA as severe service cranes designed for 20 or more lifts per hour at or near the rated capacity.

A twin hook hoist was integrated into the custom trolley design, while the hoist was cross mounted to enhance hook coverage and allow both hooks to move closer to a turntable between the crane bays.

The cranes also met NEMA 4 specifications with motors, controls, and open gears covered to protect against blown dust and splashing water. The remote control system also incorporates controls for the vacuum lifter, preferred to chains, for example.

Runway system

The runway system, the elevated structure on which the cranes travel, was custom-engineered and installed to work



within the given dimensional constraints. The building consists of two side by side bays, sharing a common centre row of columns with three cranes and three runways in total. Two cranes and runways are in the right hand bay at different elevations, one above the other. The prep bay runway is 350ft long with a distance between supports of 29ft and a column height of 30ft.

Bases were used both parallel and perpendicular to the direction of the runways on the outboard columns. The runway for the pouring/stripping bay is 250ft long and the distance between supports is, again, 29ft.

The columns in the centre row are free-standing and must bear the weight from all three cranes. Thus, NAI installed left side haunches on the centre row of columns to support the prep area's 10 US ton crane and right side haunches to help support both cranes in the right hand bay.

The middle column line of the runway was designed to match the profile of the building column in order to avoid using more space than necessary.

Kiewit Bilfinger-Berger needed the hooks on the prep bay crane to be no more than 5ft 10in from the centre-line of the middle column so they could place the concrete moulds on their turning table. They also required the hooks on the stripping crane to be 6ft 9in from the column centre-line to the hook in order to access the same turning table.

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