

Erection 1500 Te Goliath Crane

Client: Hyundai Heavy Industries, Ulsan, South Korea



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The worlds largest 1500 Te Goliath Crane which was taken down and transported from Malmo, Sweden, by Fagioli PSC was re-erected in four phases using a combination of computer control and manual systems at the Hyundai Heavy Industries (HHI) Offshore yard in Ulsan, South Korea.

Several Fagioli PSC computerized remote control systems, working in stand alone mode and also network mode, were used for all aspects of the following operations.

Phase One - Shear Leg (920 Te/120metres tall) and Pier Leg (1550 te/120metres tall) Roll-Up.

A temporary tower (85 metres tall) was constructed between the two legs; this was guyed using four L50 jacks and two L180 jacks placed behind the tower to counteract the higher weight of the pier leg. The legs were laid horizontal with their bases each mounted in two roll up trunnions. Eight L600 jacks mounted in tension frames, four for each leg, were positioned at the top of the temporary tower and affixed pad eyes located on both legs.

The Pier Leg was initially rolled-up to an angle of 26 degrees with the assistance of HHI cranes. Both legs were then rolled-up simultaneously in varying increments until ~ 85 degree angle was achieved while in coordination of the survey monitoring team the temporary tower guys were re configured to ensure the tower remained in a vertical position. The use of the L600 jacks was then suspended and the roll-up continued using four leg wind stability guys (each one L180 jack) on each leg. These were arranged to allow two jacks either side of each leg, two jacks lifting and two jacks lowering, thereby continuing the roll-up to 90 degrees and ensuring that the legs did not topple over. This also allowed the L600 jack cables to detension as the roll-up progressed.

Phase Two + Three - Shear Leg + Pier Leg Lifts Allowing Positioning of Two Bogies Beneath Each Leg.

Four temporary towers were positioned at the corners of the base of each leg. Each tower had an L600 jack attached by anchor to a pad eye located on the leg. The leg was lifted in increments of roughly 50mm. In conjunction with the theodolite monitoring team the four leg guys and four L50 jacks attached to the sill beam were paid out to maintain the verticality of the leg. Each leg was lifted 8.5 meters from the roll up trunion and held until the bogies were inserted. The legs were then lowered about 1.7 meters so that the legs then rested in their final position on a pin located on each bogie. The leg wind guys and sill beam guys were paid in the same manner as the lift to ensure the verticality of the leg.

Phase Four - Main Girder Lift (165 meters length, 14.5 meters deep and 11.2 meters wide, total weight 3,850 Te)

Four L600 jacks were placed on top of each leg were used to lift the main girder. The jacks sat on a formation of four Fagioli PSC cantilever beams and stools which were tied back to a combination of four L180 jacks on the Shear Leg and two L300 jacks at the Pier Leg end. The lifting jacks were connected to the beam using L600 fixed anchors housed in a twin fabrication and connected by pin to a specially constructed ring frame in the main girder.

For storm wind stability, four L600 jacks, one positioned laterally at each corner of the Main Girder, and four L180 jacks for longitudinal stability were deployed. These also gave the capability for movement of the beam, in conjunction with the lifting jacks, during final fit up.

The beam was lifted a total of 115 meters to its final position for welding out to the legs.

