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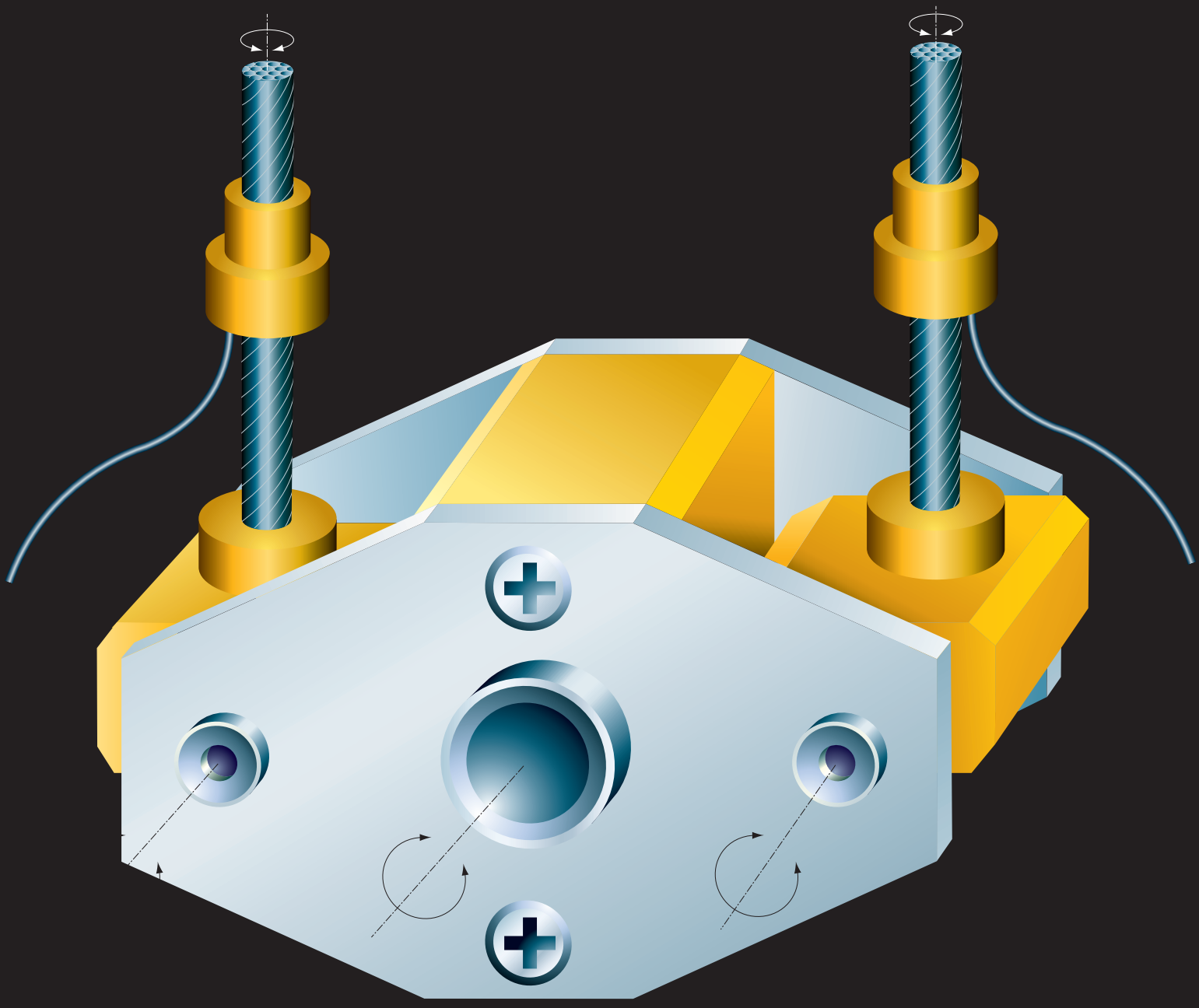

Manufacturing made easy

Overload devices • On site • LEEA

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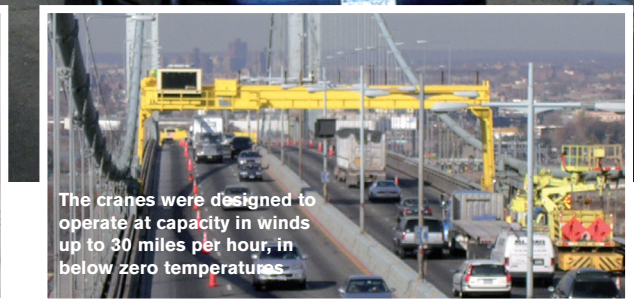

The cranes were designed to operate at capacity in winds up to 30 miles per hour, in below zero temperatures

Bridge work for

North American Industries supplied four 30 US ton gantry cranes for a spectacular redecking project on the Bronx Whitestone Bridge in New York where high wind was just one obstacle they had to overcome

Perini Corporation and O&G Industries teamed-up with North American Industries, Inc. (NAI) to design and manufacture four gantry cranes to provide all the lifting requirements on the 7,000ft long bridge (including the approaches) - one of three major bridges connecting New York City to surrounding boroughs.

Perini Corporation is one of the biggest contractors in the US, while O&G is a private construction services company headquartered in the the north east of the States. The two companies were responsible for the redecking project, while NAI designed the cranes.

Excluding the approaches, the bridge has a length of 3,770ft. The longest span is 701.4m (2,300ft), while the total length is 1,149.10m (3,770ft).

The 30 US ton gantry cranes primarily tackled the task of moving equipment from one side of the bridge to the other. They were designed to accommodate flexing of the

North American Industries has also recently custom-designed and installed a radio remote controlled 5 US ton pivoting circular crane, with a 53ft span, for the Institute for Advanced Vehicle Systems (IAVS) building at the University of Michigan, Dearborn. The university was established in 1959 with a donation of 196 acres (793,000 square metres) from the Ford Motor Company. Today, more than 8,500 students attend the university, which employees about 500 faculty members.

The IAVS building now houses the crane to lift and manoeuver vehicle parts and equipment on which faculty and students conduct research.

JM Olson Corporation was the general contractor for the IAVS building expansion project, and Lord, Aeck & Sargent was the architectural firm that designed the two-story, 46,000 square foot addition.

The crane travels 360 degrees around the main room and operates in the centre of the facility with one side riding on a rail around a centre pole and the other side running on a runway attached to the outer circular wall that forms the structural shape of the building.

The inner and outer rails were bent to form the appropriate circular path for the end trucks. The end trucks align with the curved rail. The inner end truck is built with two idler wheels and four pairs of side guide rollers to keep the inner end truck in position riding on the rail around the building's centre column. The hoist can manoeuver about 7,600 square feet, including the hook approaches. Although the crane moves in a circular path like a jib crane, it also shares similarities with a bridge crane in that it operates by riding on a runway.

The 30 US ton gantry cranes primarily tackled the task of moving equipment from one side of the bridge to the other

bridge cranes

bridge which even changed depending on the weight of traffic in a certain direction.

The cranes removed the original concrete filled steel grid deck - which was 4.5 inches thick - and installed new lightweight, orthotropic steel deck. They also had 3 US ton auxiliary hoists used to move traffic barriers.

The cranes worked both the length of the bridge and across it. Two gantries had runway lengths of 1,100ft, and two had runway lengths of 800ft so they could move forward and backward covering the length of the bridge. The crane's girder (on which the hoist and trolley moved right and left) had a 70ft span crossing above the six lanes of the bridge. Traffic could flow under the cranes to avoid closure during construction.

In addition, the cranes were designed to negotiate the longitudinal slope of the bridge. The end truck motors were sized to allow the cranes to travel up and down a maximum slope of 4%, at full capacity. Full length catwalks were also built on each crane for easy access above active travel lanes.

Other obstacles were environmental; while designing, NAI had to consider the effects of wind, rain, snow and even ice. These were overcome with weatherproof removable covers over all motors and open gears. There were also heaters in all motors and panels to eliminate the threat of condensation build-up.

The cranes were designed to operate at capacity in winds up to 30 miles per hour, in below zero temperatures. Given that the cranes had to work successfully in outdoor conditions without a convenient power source, the cranes were self contained by incorporating a diesel generator mounted on each crane.

Overhead Cranes

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