

## Olmsted Dam Major Equipment Super Gantry Crane

### Operational functions and details

The Super Gantry Crane can lift a maximum of 5,100 tons, and is required on this project to lift and carry the large precast concrete shells that will be set in the river to construct the Olmsted Dam. The gantry crane is wheel mounted, and travels on steel rails. It will be used to lift and carry various lifting frames as well as positioning them for installation on the precast shells. This crane has the capability to move the lifting frames perpendicular to the crane rails. The Olmsted Dam gantry crane is the largest gantry crane of its kind in the world.

The gantry crane is a self-contained piece of machinery, operating off generator power. The top of the gantry crane supports twelve strand jacks, the primary lifting mechanism to raise and lower concrete shells. The crane is designed such that the two upper most beams, known as strand jack beams, can be hydraulically adjusted to conform to various lifting frame configurations.



**View of Super Gantry Crane with Strand Jack System installed.**

### Facts & Figures

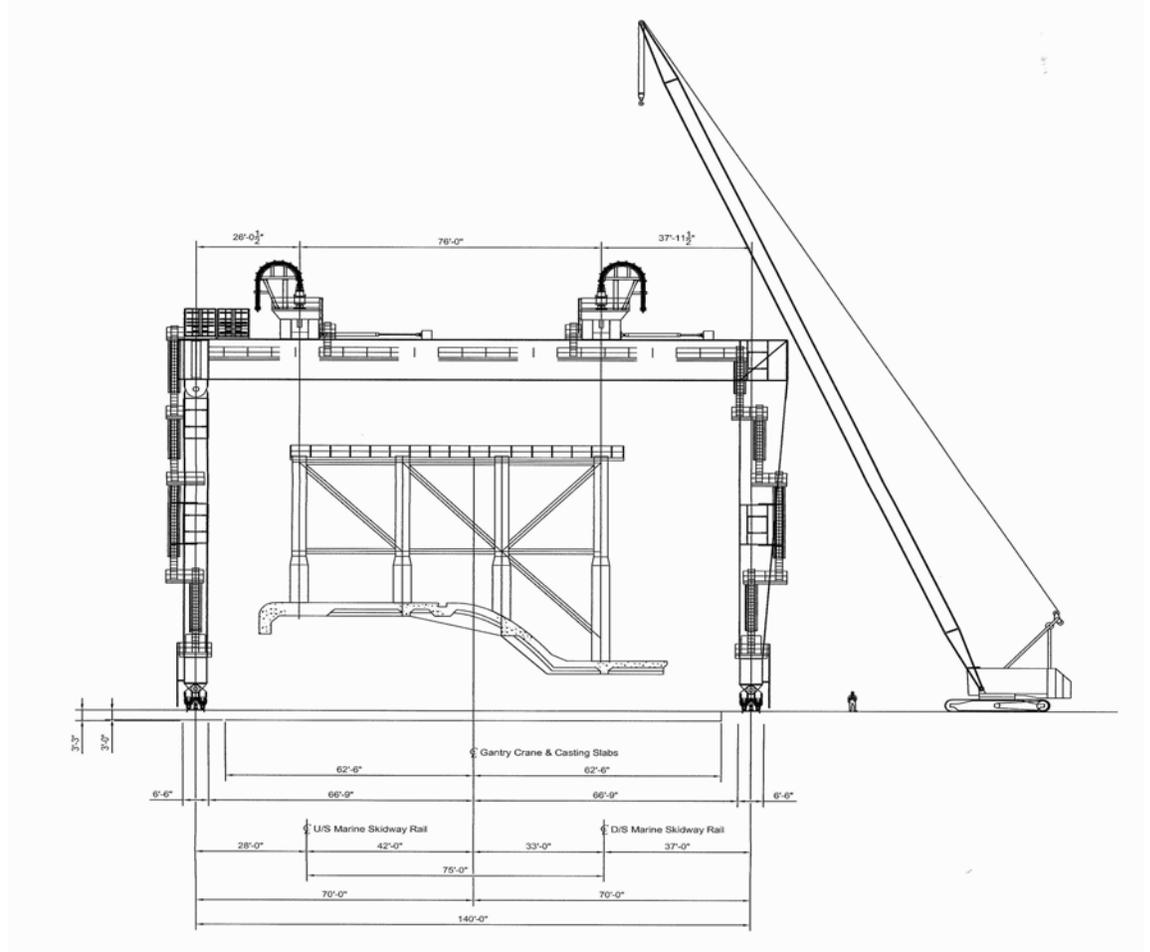
- **Cost:** \$9.5 million (for crane alone, does not include assembly, foundations or lifting equipment)
- **Major Components:** The major structural components of the gantry crane are eight travel truck assemblies, eight vertical legs, twelve box beams, four girders, and two strand jack beams. Approximately 5,000 bolts and extensive welding holds these components together to comprise the gantry crane.
- **Power Source:** The gantry cranes operates off a crane mounted 300 KW Caterpillar diesel generator
- **Drive Motors:** The gantry crane is powered by twelve each, seven horsepower electric motors
- **Lifting Capacity:** The crane is designed to lift 5,100 tons. By itself the crane can lift nothing without the separate Strand Jack System described in the following section.

- **Travel Speed:** In an unloaded condition, the gantry crane will travel at 20 feet per minute. In a loaded condition, the gantry crane will travel at 10 feet per minute.
- **Travel Wheels:** Sixty four, 36" diameter steel wheels are utilized for the movement of the gantry crane. There are four rails, two per side, the crane travels along. Total runway length is 1,200 feet.
- **Crane Dimensions:** Overall dimensions of the crane are 100' long from travel truck #1 to #4, 160' wide from outside of leg to outside of leg, and 140' high from ground level to top of strand jacks.

- **Clearance**  
**Dimensions:** The clearance or interior dimensions of the gantry crane are 100' vertically and 130' horizontally.

- **Designer / Vendor:** The gantry crane was designed and supplied by Ederer LLC, a division of PAR Systems, Seattle, WA.

- **Erection of the Gantry Crane:** Washington Group / Alberici was responsible for the erection of the crane. Pre-erection on the ground of the girders, beams, and leg assemblies took approximately one year. Lifting and erection of main structural members took two months to



**Drawing of Super Gantry Crane with lifting frame and shell.**

complete. Two Manitowoc 4600 crawler cranes were utilized to lift and place these components. The heaviest lift in this process was #1 girder, weighing 428,268 lbs which put each of the crawler cranes at 95% of their maximum capacity.

- **Gantry Crane Foundation:** Each side of the gantry crane travels on rails running the 1,200 foot length of the precast yard. There are two rails per side, which are mounted on top a reinforced concrete grade beam. Under the concrete grade is a staggered configuration of 12" steel H-piles. Reinforced concrete grade beams 6.5' wide x 3.25' thick, with 2,000 each, 12" steel H-Pile supporting the grade beams

### Lift System Facts & Figures

Mounted on top of the two strand jack beams are twelve strand jack platforms that support the 1100+ ton Strand Jacks capable of lifting at a rate of 20 feet per hour. The lift system is the same for both the Super Gantry Crane and Catamaran Barge. (See separate flyer on this topic.)

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