

Location

MGM Grand
Las Vegas, Nevada

Client

Marnell Corrao Associates /
MGM Grand & Cirque du
Soleil

Services

Structural Design
Mechanical Design
Construction Admin.
Resident Engineering

Contract Period

2002-2004

Construction Value

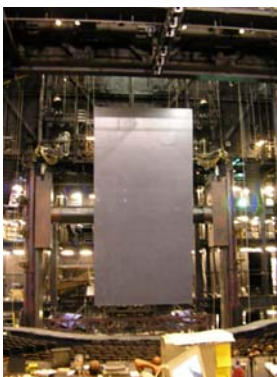
\$19,000,000

Reference

Marnell Corrao Associates
222 Via Marnell Way
Las Vegas, NV 89119
Mike Spainhour, Vice
President Construction
(702) 739-2000



Gantry Crane



Gantry Crane - Forward Tilt

Project Description

In order to prepare for the "Ka" production by Cirque du Soleil, a multi-million dollar renovation of the MGM Grand Showroom was undertaken. As well as a complete reconstruction of the audience and performance spaces, it included the construction of several of the largest custom pieces of theatrical machinery in the world.

McLaren's Role

McLaren initially developed "parametric" studies of conceptual machinery solutions that correlated a range of variables with cost, i.e., geometry, weight and speed versus horsepower. These studies proved invaluable to Cirque Du Soleil in its selection of the systems to be constructed.

McLaren provided structural and mechanical design services for the Tatami Deck and the Gantry Crane and its Sand/Cliff Deck, as well as construction and installation oversight and project coordination for the Gantry Crane assembly. The Gantry Crane supports a payload of approximately 300,000 pounds. The entire Crane travels 70' vertical from the pit to high above the audience level, while it moves its 25'x50'x6-1/2' performance platform from level to a forward tilt of 100°, and rotates infinitely in either direction combined with any tilt. The Tatami Deck presents its 30'x30' performance platform by traveling 48'-6" from its stored position to its play position using a two-stage mechanism similar to a drawer slide.

McLaren also provided engineering services for a variety of production rigging systems, house arbor guide seismic upgrades, and supports of these rigging elements.

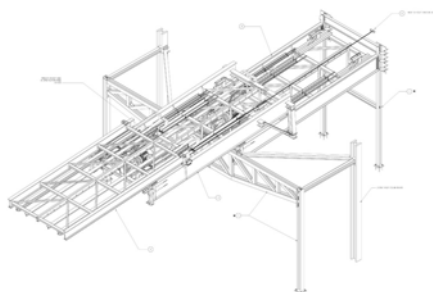
Project Challenges

The greatest challenge of the project was to design and oversee the construction and installation of prototype machinery that had to work correctly at the first rehearsal and for every performance during a 15-year expected production life. This had to be accomplished while working within the constraints of the Production's aggressive timetable and while coordinating with many other firms. The design pushed the envelope of theatrical machinery design, while adhering to acceptable measures of safety and reliability.

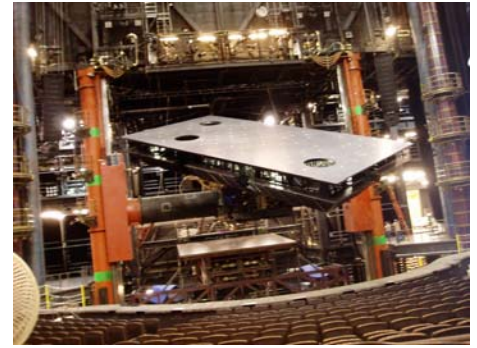
Client Benefit

Amongst the most significant benefits that the Client received from McLaren were the useful parametric study and pre-visualization graphics, experienced engineering design of innovative and practical stage equipments and the coordination that we provided. The design and construction of the Gantry Crane required the direct involvement of eight firms in

addition to the Client and Cirque du Soleil. The installation involved the coordination of five different fabricators, five different union trades, and five different divisions of Cirque du Soleil's production staff. McLaren provided assistance in coordinating all of these participants and resolving conflicts amongst them.



Tatami Deck - Extended Position



Gantry Crane - Tilted and Slew