

New, prominent signage
for one of Las Vegas' premiere
hotel-casinos serves as a lighthouse
of sorts in a city of lights.

Boulevard Beacon

BY JACK LESTER

WHEN CITY CENTER OPENED in Las Vegas in late 2009, it was one of the largest private industry development projects in the world.

A mixed-use urban complex in the heart of the Strip, it included four individual hotels/condominium buildings, a casino and a vast shopping, dining and entertainment center. The development was even large enough to have its own on-site fire station.

However, it eventually became apparent to the owner that the signage wasn't up to par in terms of providing clear directions to the casino at one of the City Center hotels, ARIA Resort and Casino. Upgrades and additions to existing signage were called for, including a new pylon sign adjacent to Las Vegas Boulevard.

This two-legged pylon is impossible to miss, even smack-dab in the middle of a landscape of constantly glittering lights. Extending 260 ft above the sidewalk, it is 65 ft wide and varies in thickness from 9 ft, 6 in. at the ends to 16 ft, 9 in. at the center. Most of the north and south faces of the sign are populated with 25mm LEDs totaling 26,300 sq. ft, with the remaining 17,000 sq. ft covered with a composite aluminum skin. The total sign weight is 644 tons, including 435 tons of structural steel.

Long Tall Signage

When it comes to steel framing systems, signs are very different from typical building and bridge projects. Where these structures are generally assembled and erected on-site, with the floors and mechanical systems following the framing, signs tend to be pre-assembled—mechanical systems, painting, skin, catwalks, ladders and everything else—then shipped to the site as plug-and-play elements, with the individual shipping modules match-assembled (stacked) to ensure alignment prior to shipping to the site.

Such was the case with the ARIA sign. There are six fabricated steel sections for each of the sign's two legs. Each section consists of four vertical wide-flange members with square HSS diagonal and horizontal truss sections. The column truss sections were designed as trapezoids to maximize the strength in the available space between the north and south curved faces of the pylon. The weight of these 12 shipping sections varied from 42.5 tons for the bottom sections to 9.5 tons for the top. The total weight of both leg sections was 312 tons.

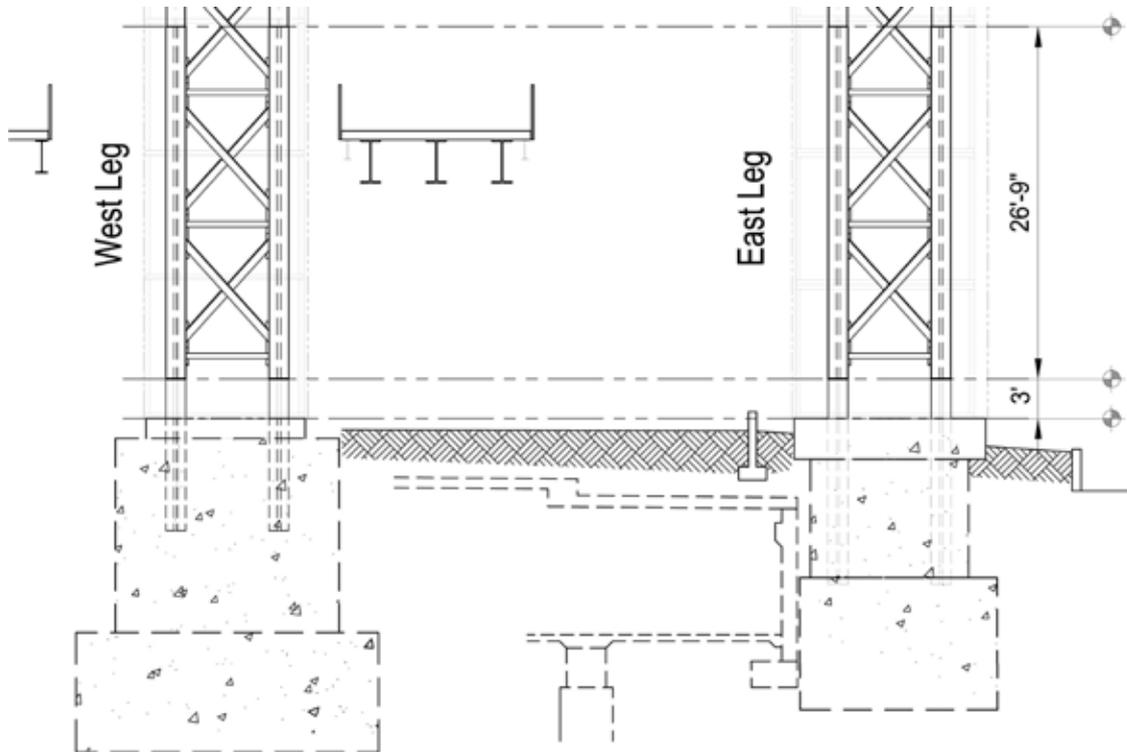
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- ▶ ARIA's new sign rises 260 ft above Las Vegas Boulevard.
- ▶ The sign uses 435 tons of structural steel.

Images courtesy of YESCO





▼ Framing for the east leg of the sign.

▲ The framing system for both legs.



There are nine individual LED cabinets, most of which (excluding the lower pole covers) were 65 ft long by 16 ft, 9 in. wide by 10 ft tall. The heaviest was the top cabinet, at 23.5 tons, and the roofing provides drainage through the sign as well as davits that give access to the exterior of the sign for periodic washing of the faces. Most of the electrical components can be maintained from the inside, with each cabinet level having 750 sq. ft of interior floor space.

One of the most significant challenges of the project was that the western leg of the sign needed to fit through an existing opening of the elevated walkway for pedestrians crossing both Las Vegas Boulevard South and Harmon Avenue. The clearance from the sign leg to the opening was about 8 in. on two opposing sides. This same leg then extended down through an existing flower bed, then through a steel-supported concrete garage roof, and continued down to a new footing at the garage floor. This footing would eventually use some existing piles in addition to new piles (drilled reinforced concrete piles) that needed to be drilled in a horizontally and vertically restricted space. The eastern leg of the sign was sandwiched between a number of utilities, including a long storm water

catch basin adjacent to Las Vegas Boulevard and the existing basement wall of the parking garage.

Another challenge was finding an appropriate crane. It would have to accommodate the proximity of existing buildings and ever-busy Las Vegas Boulevard while also meeting the lift requirements of 42 tons and a vertical reach requirement of 300 ft (in order to accommodate the sign's height). The construction team ended up selecting a 300-ton Liebherr LR-1300 with ample reach and weight capacity: 368 ft of boom and 138 tons of counterweight. The crane pad was placed atop (or adjacent to) the catch basin for which a cover had to be designed to support the crane's weight. In addition, the walls of the basement had to be braced against the crane surcharge.

The project was finished on time with no disruption to pedestrian or vehicular traffic—and now stands as a prominent traffic beacon to guide that traffic to the heart of City Center.

MSC

Owner

ARIA Resort and Casino, Las Vegas

Structural Engineer

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