



PROJECT

Celtic Manor
M4 Overbridge
Newport, South Wales

CLIENT

Celtic Manor
International Convention Centre

MAIN CONTRACTOR

Alun Griffiths (Contractors) Ltd





Overnight installation of box beam bridge completed ahead of schedule with minimal disruption to motorway traffic and hotel guests.

Requirement

The five-star Celtic Manor Resort secured funding to construct a new £83m, 5,000-delegate International Convention Centre within its extensive parkland. The existing single-lane bridge over the M4 used to access the site would be inadequate for the increased volume of traffic that would need to access the new convention centre. A new bridge needed to be built over the M4 ahead of the opening date for the new centre.

Solution

Abergavenny-based main contractor Alun Griffiths chose Cleveland Bridge to fabricate, supply and install a new bridge, to be built immediately east of the existing motorway bridge. The two bridges will each provide one-way access for traffic either entering or exiting the resort and convention centre.

Alun Griffiths chose Cleveland Bridge having worked with the company on similar successful bridge-building projects in recent years. The contractor had complete confidence in Cleveland Bridge's ability to work efficiently within strict road closure timeframes and to complete major works on schedule to the highest standard.

The 150-tonne bridge was constructed from 2.3m-wide weathering steel box girders measuring 50.5m long. Box girders were chosen over traditional 'I' beams for their reduced weight and improved aesthetics. Cantilevered beams for the bridge parapets were fitted in the factory, extending the beam width to 3.5m and reducing formwork installation once the beams were on site.

Project Scope

Cleveland Bridge fabricated the box girders and parapet beams and delivered them to site well ahead of the installation date. They were delivered to a holding area adjacent to the M4 where Alun Griffiths could fit the GRP deck formwork at ground level. This not only reduced the work required during the M4 closure for installation, but also reduced the amount of working at height required on the project. The single-span girders were lifted into place onto concrete abutments during a single overnight closure of the M4.

Challenges

The biggest challenges were the proximity of the bridge site to an extremely busy stretch of the M4 and a major interchange roundabout, and the proximity to the world-class Celtic Manor venue, which had to remain open and accessible to visitors throughout the works.

To minimise disruption to road users and hotel guests, the installation had to be completed as quickly as possible within a single overnight road closure during. That meant installing as much formwork as possible at ground level prior to the installation date. On the night of the closure, the crane was configured on the westbound carriageway, from where it could complete all lifting operations, enabling the eastbound carriageway to remain open for an additional four hours – reducing disruption to road users.

"I would like to say a huge thank you to Cleveland Bridge for your help, professionalism, hard work and persistence in ensuring the installation of the box beams went as successfully as it did."

*Russell Phillips
VP Facilities & Development
Celtic Manor Resort and ICC
Wales*

Outcomes

The lifting and installation went without a hitch, enabling the road to be handed back at 6:30am on Monday – ahead of the planned 8am reopening. This meant rush hour traffic could use the road sooner than expected.

Despite such a major infrastructure project being carried out so close to this prestigious hotel resort, there was no disruption to guests or staff. Russell Phillips, Vice President of Facilities and Development at Celtic Manor complimented Cleveland Bridge on this achievement, saying: "It's a huge testament to the planning and thought that went into last night's operation that we had no complaints whatsoever from Celtic Manor's guests or local residents."

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