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THE JOHN V. TUNNEY BRIDGE: A NEW COURTYARD CONNECTION FOR THE HAMMER MUSEUM

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Summary

The John V. Tunney Bridge was completed in 2015 inside the interior courtyard of the Hammer Museum in Los Angeles, California. It is the result of a successful collaboration between Michael Maltzan Architecture, Guy Nordenson and Associates, John A Martin & Associates Inc, the contractor and the museum. Although the span is modest (11m), the bridge is an elegant response to multiple design challenges including the difficult task of adding a footbridge to a twenty-five-year-old existing building on a constrained site, in a highly seismic area with minimal disruption to the museum operations.

The bridge design takes advantage of the geometry of the existing courtyard, and uses curved members both in plan and in elevation to hug the existing rectilinear building smoothly, creating a seamless connection between galleries. The primary steel structure, which is exposed, consists of steel wide flange beams supporting a slab on deck. Seen from below it appears to hover above the courtyard on invisible supports. The bridge's contemporary architectural expression provides a highly-refined pedestrian connection that compliments the original building's aesthetic and creates an exciting focal point for the museum.

The merits of the design given the different challenges encountered are discussed in detail in this paper. Its success is attributed to a well-planned process and an effective collaboration between all parties involved.

Keywords: bent steel; perforated steel plate; museum; aesthetics; dynamics; existing building addition; seismic hazard; collaborative design; constrained site

1. Introduction

Located inside the courtyard of an existing museum, the bridge distinguishes itself by its elegant design in this unusual and challenging site. In Los Angeles, due to the high seismic hazard, this kind of intervention requires that special care be taken in the design of the bridge itself, but also at a larger scale, in considering the impact of the addition on the existing building's lateral system. Other challenges included the necessity to develop an erection sequence in a constrained site, with minimal disruption to the museum operations.

The team assembled to take this project to completion included Michael Maltzan Architecture (MMA) as the Architect, Guy Nordenson and Associates (GNA) as structural engineering consultant, John A. Martin & Associates (JAMA) as the Engineer of Record, and MATT Construction for both pre-construction services during the design phases and as Construction Manager during the Construction Administration (CA) phase.

2. Project Description



Fig. 1. and 2. The John V Tunney Bridge at the Hammer Museum (Photos by MMA)

3. Challenges Encountered

The merits of this pedestrian bridge design include its elegantly curved geometry both in plan and in elevation, as well as the surgical intervention to the existing structure, which resulted in almost invisible connections. The new bridge not only fits perfectly within the shape of the existing courtyard, but also it seems to be hovering between the exterior walkways. The bridge supports were designed to be invisible and to limit the impact of the bridge addition on the existing building's structure in the event of an earthquake.

3.1 Support Connection Design in the Context of an Existing Building

A combination of sliding and fixed supports enables control of the distribution of seismic forces into the existing building diaphragm, as well as of human induced vibrations.

3.2 Constrained site and schedule

The structural pieces had to be hoisted over the building from a crane positioned on the street. It was clear that the bridge structure should be pre-assembled in the shop as much as possible to limit the amount of site work to a minimum. Since the museum was to remain operational during the CA phase, and also to limit traffic disruptions, most of the erection sequence was completed over two different nights: the bridge primary structure was erected during the night of 7 November 2014, and the guardrail was installed during the night of 20 November 2014.

The design took place over six months including some review periods to confirm approval by the Owner in the early stages, monitor the cost along the way and finally obtain approval from the Building Department of Los Angeles. Design and construction combined took a little over 12 months.

4. Discussion: The Result of Successful Collaborations

Given the complex geometry of the bridge and guardrail designs, close coordination and careful 3D modelling were at the heart of the design process. The communication within the design team during the design phases took place over regular conference calls, involving screen sharing and live sketching, as well as in-person meetings in Los Angeles. The contractor was on board for pre-construction services, which allowed the design team to incorporate changes related to the erection sequence early in the process. During the construction phase, the design and construction teams were well acquainted and the relationships that were established in the design phases continued to develop. The project was built both on schedule and within the allocated budget (US\$900,000).

5. Conclusions

The success of the design can clearly be traced to the team that was assembled and the open and productive design dialog that occurred between the team members during both the Design and the Construction Phases.