

ATWATER VILLAGE CABLE STAYED EQUESTRIAN BRIDGE

Authors: Dan FITZWILLIAM¹

Affiliation: ¹ Senior Bridge Engineer, T.Y. Lin International, San Diego, California, USA – dan.fitzwilliam@tylin.com

Summary

This will be the first cable stayed bridge in the city of Los Angeles and possibly the first cable stayed equestrian bridge in the world. With a very slender, light-weight deck and relatively heavy equestrian live loads, the bridge's dynamic behavior was a major design consideration. In order to mitigate the potential for resonant vibrations during passage of groups of equestrians, a system of tuned mass dampers was designed for the bridge. Traditional girder bridges typically have a span to depth of 20:1 or 25:1. Cable stayed bridges might push that ratio to 100:1. Innovative design and the use of tuned mass damping of the superstructure allow this bridge to use a span to depth ratio 130:1. The deck is divided into two pathways: a twelve foot wide pedestrian side with a hardwood deck and stainless steel mesh railings; and a twelve foot wide equestrian side topped with horse friendly rubber paves and a less transparent wooden picket railing system.

The cable-stayed bridge type is also the first of its kind in Los Angeles. High-stressed cables are incrementally attached to the 38-meter tall mast and configured in a fan pattern, creating a distinctive element in an otherwise homogenous landscape. To residents in the area, the bridge is a welcome enhancement to the amenities they already know exist. However, its visibility to drivers on Interstate 5 stokes the curiosity of commuters in neighboring communities and cities to come see the bridge, enhancing the opportunity for non-vehicular recreation and outdoor activity. As the first completed symbol of renewal and revitalization, the North Atwater Non-motorized Multimodal Bridge is a champion of community identity and civic pride.

Keywords: Cable stay; equestrian; dynamics; vibration response; damping; wood; LA River.