

6th Avenue Bridge

STRUCTURE



December '09

- The bridge contains approximately 1.2 million pounds (600 tons) of structural steel and approximately 55,000 high-strength structural bolts.
- The arches and the cables provide the majority of the structural support of the bridge.
- The maximum width of the bridge is 43 feet and it will carry two light rail tracks.
- The height of the bridge from the top of the crown to the bottom floor beam is 65 feet.
- The bridge is built with high-strength steel called "weathering steel". It will naturally rust to a dark purple-brown color and form a protective oxide coating, eliminating the need and expense of painting, now or in the future.
- The tracks and ballast crossing the bridge weigh more than all of the structural steel in the bridge.
- Each of the main pier columns is designed to support 2.7 million pounds of weight and the structure can withstand a sustained hurricane force wind of 100 mph.
- The substructure supporting the span contains 10,686 cubic feet of concrete and weighs 1.6 million pounds.

ARCHES

- The arches angle inward making the width of the arches at the ends of the bridge 43 feet and the width at the crown is 16 feet.
- Each arch is designed to withstand a compressive force of nearly three (3) million pounds. From extreme cold to extreme hot, the arch span will elongate approximately 3.5 inches.
- The hollow arches have full interior access to facilitate construction, future inspection, and maintenance.
- The steel arch span is supported on its own bearings on the two piers adjacent to 6th Avenue and is not directly attached to the approach spans. There are expansion joints at each end of the arch span (to accommodate temperature movements).
- The shape of the arch is defined by a mathematical equation which emulates the equation used to describe the force of gravity.



February '10



March '10



May '10

CABLES

- There are a total of 44 cables on the bridge, approximately 1,950 feet total.
- Each cable is 2 3/8 inches in diameter and has a breaking force of 688,000 pounds (344 tons). If one cable breaks, which is very unlikely, the bridge can still support itself.
- The cables will be lit with white LED lights, which have a lifespan of 100,000 hours, or about 11 years.

CONSTRUCTION

- The arch bridge was constructed and fully assembled at the manufacturer's site in Oregon. It was then disassembled and transported to Colorado in 34 truck shipments.
- The bridge was rolled across 6th Avenue on Saturday, May 1, 2010. All lanes of 6th Avenue were closed between Kipling and Simms/Union in Lakewood from Friday night, April 30 to Monday morning, May 3, 2010. The bridge moved across all lanes of 6th Avenue in approximately 14 hours.
- Transporters that guided the bridge across the highway consisted of two 35 foot transport platforms with 8 axles each. Both of these transport trailers contain hydraulic rams used to keep the platform level.
- The southern end of the arch traveled on guided rollers pushed by hydraulic rams, which were the main driving force.
- This was the first time in the U.S. that a basket-handled tied arch bridge was 'rolled out' using this method.



May '10

OVERVIEW

Total weight of bridge	3 million pounds
Length of bridge	610 feet
Number of spans	5 (81', 81', 286', 81', 81')

The 6th Avenue Bridge is part of the RTD FasTracks West Rail Line.

Designed by Kip Coulter, David Evans & Associates.

Constructed by Edward Kraemer & Sons, sub-contractor to Denver Transit Construction Group.