

Indiana Bridge

STRUCTURE



September '09

The Indiana Bridge, made from both concrete and steel, is the longest structure on the West Rail Line with an overall length of 1,531 feet 6 inches.

There are a total of 11 spans – five concrete spans on the northwest side, three steel spans over 6th Avenue, and three concrete spans on the southeast side.

The bridge is constructed in three independent frames. The first and third frames use a post-tensioned concrete box girder system to carry the track. The middle frame uses three steel plate girders.

The concrete box girder is rectangular in shape measuring 7 feet deep and 15 feet wide.

The span over the intersection of 6th Avenue and Indiana Street is the longest span on the corridor at 270 feet.

The tallest columns are over 40 feet tall, raising the track high enough to allow for future construction of a ramp between 6th Avenue and I-70.

The steel in the frame weighs over 890,000 pounds.

The type of high-strength steel used for the steel plate girders is 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 height of the plate girders varies from 6 feet 2 inches, at the shorter spans, to 8 feet 7 inches for the middle span.

To make the bridge lighter, the rails are attached to the bridge deck and the ballast and ties are eliminated.

The bridge is not designed for pedestrian or bike access.

Although the bridge is only 20 feet wide, carrying one track, trains will travel both eastbound and westbound intermittently.



October '09



December '09



February '10

CONSTRUCTION

To build the concrete box girders for both frames, it took over 48,000 cubic feet of concrete (weighing of 7.2 million pounds) and 128,000 feet of steel post-tensioning strand.

The concrete sections were completed first using temporary forms (made of wood and steel) until the concrete was strong enough to post-tension the steel strands.

Each steel post-tensioning strand was pulled with a force of about 44,000 pounds to put the concrete into compression after it hardened.

Two of the steel plate girder sections were bolted together on the ground before they were lifted into place by large cranes. The third girder section was lifted adjacent to the other two and attached to this original pair.

6th Avenue was closed for two consecutive nights (from 9 p.m. to 5:30 a.m.) to install the final steel girder section over the 6th Avenue freeway.



May '10

OVERVIEW

Total weight of bridge	6 million pounds
Length of bridge	1532 feet
Number of spans	11
	(90', 125', 140', 140', 126', 144', 290', 122', 154', 120', 88')

The Indiana Bridge is part of the RTD FasTracks West Rail Line.

Designed by Tammy Heffron, Bridge Section Manager, HDR Engineering, Inc, sub-consultant to David Evans & Associates

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