

# Consolidated Mainline Bridge

## STRUCTURE

- The double track, light rail Consolidated Mainline (CML) Bridge spans a length of 770 feet, crossing over the Union Pacific and Burlington Northern freight tracks, as well as Umatilla Street.
- There are five spans, the longest reaching 180 feet. The bridge width is 35 feet 4 inches.
- The bridge is made up of four girders. These welded plate steel girders are spaced at 7 feet 3 inches with a depth of more than 6 feet. Each of the main pier columns is designed to support 4.15 million pounds.
- The bridge is built on a very tight curve, with a 300 foot radius. This requires the light rail trains to slow down to a maximum speed of 20 mph. Curved bridges want to “twist” between supports as the trains pass over. In order to reduce this twisting action, a system of stout cross frames and bottom-flange lateral bracing was used to stiffen the bridge and help transfer loads.
- 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.
- The bridge required 60,000 cubic feet of concrete and 400,000 pounds of reinforcing steel.

## CONSTRUCTION

- Due to constrained accessibility, some work on this bridge was done at night or on weekends.
- During construction over the railroad tracks, railroad safety flaggers were required to coordinate train movements with construction work.

## OVERVIEW

Total weight of bridge 9.4 million pounds  
 Length of bridge 767 feet  
 Number of spans 5 (154"-180"-180"-150"-100")

*The Consolidated Mainline Bridge is part of the RTD FasTracks West Rail Line.*

*Designed by Tammy Heffron, HDR Inc., sub-consultant to David Evans & Associates.*

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



June '10



June '10



September '10



April '11