

History

In 1976 The Department's Standard Specifications (these are for contracts for new construction) were revised to include requirement for the partial removal of formwork as deemed necessary for inspector access.

With time the Department determined the partial removal was inadequate so in 1991 the Department revised the Bridge Design Manual requiring designers of any new box girders to include requirements for appropriate inspector access and formwork removal in the bridge construction plans.

In 1991 the Department revised its Standard Special Provisions, and in 1996 the Standard Specification book, to require all formwork to be removed from boxes with internal access and for the boxes to be vacuumed clean—again in new construction contracts. This did not address the removal of formwork in existing bridges. None of the bridges the Department has identified as currently needing formwork removal were built after 1991.

In August of 2008 the Departments Bridge Branch and Region 6 began working towards a project that would remove the forms from 12 older box girder bridges in the Denver area. At this time, it was noted that it was not urgent but something that should be done over the next year.

Approximately 81 bridges with internally accessible box girders were built before the changes made to design and construction requirements in 1991. Of these, approximately 17 have been identified as needing formwork removal.

These approximately 17 bridges that need formwork removal make up only 14% of the approximately 118 box girder bridges with internal access; and, less than a half percent of the approximately 3,406 total CDOT bridges.

The State's bridges have many needs that due to funding limitations cannot all be addressed at once, from replacement, to repair, widening and preventative maintenance. The Department has to prioritize these needs and work on those that are most critical to public safety and structure service life.

The majority of the older boxes with internal access and remaining formwork are generally among the bridges that are in the best condition. Only 5 of the 17 bridges identified as needing formwork removal have a sufficiency rating less than 75 (sufficiency rating is a scale from 1 to 100 with 100 being the best condition). To compare, the I-25 bridge over Broadway that was replaced a few years ago was rated a 2. These bridges are in very good condition comparatively. It should be noted that as these bridges get older, the removal of existing formwork will become a higher priority though as they deteriorate.

Where safe and practical access to the inside of box girders can be provided, the Department does so to enhance inspector and future rehabilitation operations. However internal access is not practical for most box girders and it is not available. For example, most box girders are too small to allow for inspector access. Satisfactory inspector and structure appraisals activities of box girders can and are conducted with external observation. Of course it's ideal to be able to fully inspect a bridge inside and out, however, we also rely on many other tools and inspection techniques to determine if there are issues related to bridges.

CDOT has approximately 395 bridges with box girders. Approximately only 118, or 30%, have internal access. That is, 70% of the box girder bridges are evaluated and maintained with only external access.

The McIntyre Street over SH58 Avenue Bridge and whether the formwork contributed to the deterioration of the bridge deck. I looked into (McIntyre Street over SH58 Avenue Bridge) and whether the formwork contributed to the deterioration of the bridge deck. CDOT has approximately 445 bridges