Resolution of Conditionally Accepted Alternatives

presented in the

Preliminary Value Analysis Study Report

dated February 2008

Two of the alternatives identified in the Preliminary Value Analysis Study Report were conditionally accepted, pending further study. Those two alternatives were as follows:

Alternative 3.2	Construct Cast-in-Steel-Shell (CISS) Piles with Column Extension through the Existing Bridge Deck to Allow all Piling to be Constructed in One Phase
Alternative 4.0	Drive Piles (Cast-in-Steel-Shell Piles) in lieu of Drilling and Pouring Piles (Cast-in-Drilled-Hole)

We have completed a detailed evaluation of these two alternatives and hereby respond as follows:

Alternative 3.2

By constructing the piles through the existing bridge deck we can be successful in limiting the work done from the ground level, and therefore minimize construction impacts to the BNSF rail yard operations.

One of the most important features of this strategy is limiting the reach of the crane. It appears that all of the columns could be constructed from the existing bridge deck. Bent locations will have to be adjusted slightly and column locations as well. However, the framing layout of the existing bridge provides openings of adequate size to construct 6' diameter and even 8' diameter piles without having to remove the steel framing (horizontal diaphragm members must be cut).

Extending the steel shells to slightly below the cap beam level will provide advantages in eliminating guy cables and erection of formwork, and will speed construction by eliminating additional stages to construct columns.

Constructing new pile foundations through the existing bridge deck is a very good idea, and will be incorporated into our preliminary design strategy and staging details.

Alternative 4.0

CISS pile construction may be easier than CIDH construction. Steel shells will be driven in sections and therefore will be smaller and lighter sections to lift at a single time. In addition, the steel shells will provide protection from caving as the piles are advanced below the groundwater surface elevation.

The steel shells can be sealed and de-watered to provide dry concrete placements. Also, steel reinforcement does not have to extend to the pile tips, which makes the reinforcing cages lighter for the crane, and not as tall, so that smaller cranes can be used and load demands on the existing bridge deck can be minimized.

One drawback to constructing with permanent steel shells is having to field weld the steel shell sections together (at eye level from the existing bridge deck).

Constructing foundations of CISS piles instead of CIDH piles is a very good idea, and will be incorporated into our preliminary design strategy and staging details.