



Industry Constructability Review Guidelines

Purpose

This document provides guidelines on performing constructability reviews with industry representatives during the project development stages.

What is an Industry Constructability Review?

During the plan development process, unique construction and schedule items may arise. The use of industry input is valuable to quantify and assess risks associated with these items. Contractor input is typically obtained early in the project development process. Early involvement allows the opportunity to incorporate the input received into the final design.

The industry constructability review is an informal meeting between Mn/DOT and a contractor with expertise within the risk area. The meetings are conducted with each contractor individually in order to obtain maximum input. Contractors typically are more open to sharing ideas/concepts when their competitors are not in the room. Meetings can be conducted on-site or at an office.

Benefits

Benefits to the industry constructability review process include:

Lower Construction Costs

- Contractors can identify cost savings situations or alternative designs
- Contractors can help Mn/DOT identify areas of potential risk

Construction Schedule

- Contractors can provide valuable input into construction timelines/production rates.

Project Types

- Complex or large projects with staging concerns
- Project with tight construction timelines
- Projects with new methods being proposed
- Projects when contractors can add innovation

When Should it be Conducted?

- The review should take place at about the 50% design.
 - Layout should be at or near approval stage
 - Materials recommendations should be complete
 - Potential bridge types have been established
 - Drainage concepts have been identified
 - Preliminary construction limits have been developed
 - Staging concepts have been explored, but not fully developed
 - Local concerns have been identified
 - Rough quantities for major items have been computed (order of magnitude)
 - Preliminary construction schedule has completed



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How Should it Be Conducted?

The following steps should be taken to promote a fair and effective constructability review.

- Step 1 : Develop a one-page summary of the project that summarizes the issue(s) that need to be addressed (See Example in Appendix A). The issues should be limited to high risk areas that require input from the industry to improve the success of the project. Post the one-page summary to a ftp site dedicated to the constructability review.
- Step 2: Identify the types of contractors (e.g. prime, bridge, paving) that match the issues that need to be addressed. Limit to one type of contractor if possible. Develop a potential list of contractors to determine the number of one-on-one meetings needed.
- Step 3: Set-up a meeting date, time and location. If possible, provide at least three weeks from the advertisement date to the meeting. Allow approximately one hour for each meeting.
- Step 4: To provide all contractors with an equal opportunity to participate, the project needs to be advertised on Mn/DOT's bid letting website. The Office of Construction and Innovative Contracting will coordinate advertising the constructability review with the Office of Technical Support (OTS). Contact the OCIC (Innovative Contracting- Project Development Engineer) to advertise the project. A typical advertisement would read:

Notice to All Contractors (date)

{project name and SP number} - Mn/DOT will be conducting one-on-one constructability reviews with potential {contractor type – e.g. bridge contractors) interested providing input into the development of this project. Items to be discussed at the constructability review include: . The meetings will be conducted on {dates} at {location}. If interested, contact {name, phone, e-mail} to schedule a meeting.

Additional information can be found on the following website {insert link to ftp site}

- Step 5: Schedule meetings with the interested contractors. If more contractors reply than anticipated, schedule addition meetings so all relevant contractors have the same opportunity to participate. It may be acceptable to decline contractors that do not meet the target group of contractors identified in Step 2. Consult with OCIC before declining contractors.
- Step 6: Prepare for the meeting by finalizing a list of items in which industry input is being solicited. It is often beneficial to bring visual aids such as layouts, profile, soil information).
- Step 7: Conduct the meeting. Listed below are some general guidelines for the meeting:
 - a. Limited the meeting to approximately 1 hour per contractor
 - b. Limited Mn/DOT staff to 3 to 4 (invite OCIC)
 - c. Use the meeting to gain contractor insight into solving risk, not for educating the contractors about the project.



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- d. Keep the meeting Informal in nature, allow for open discussion on project risks
- e. Do not provide handouts for the contractors to take.
- f. Although the contents of the meeting are not confidential, try not to share one contractor's input with the other contractors. Contractors will be less apt to share information if they know Mn/DOT is going to provide it to their competition.

Step 8: Prepare a summary of items discussed. The summary should not identify contractors by name. Attached is a sample summary (Appendix B).

Step 9: Post the summary and all information presented (e.g. layouts, soil info) at the meetings to the ftp site.

Step 10: Contact OCIC to modify the advertisement page to reflect the results. This is required to provide all contractors with an opportunity to review the results. Listed below is a typical update:

Notice to All Contractors (date)

{project name and SP number} - Mn/DOT conducted one-on-one constructability reviews with potential {contractor type – e.g. bridge contractors} on {date}. Results of the constructability reviews can be found on the following website: {insert link to ftp site}

Other potential {type of specialty} contractors are also welcome to provide input by contacting {insert name, telephone, e-mail}.

Step 11: If additional contractors request meetings, set-up additional one-on-one meetings. Do not deviate from the items developed in Step 6. Conduct the meeting according to Step 7.

Step 12: When the project is advertised for letting, contact OCIC to remove the notice posted in Step 10.

"If value is added we should continue with similar programs in the future.....there is nothing our members like more than interacting with the customer where both parties benefit" Dave Semerad, Minnesota AGC, commenting on TH 36 Constructability Review



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APPENDIX A – SAMPLE ONE-PAGE SUMMARY

Mn/DOT is preparing plans for Hwy 36 reconstruction from 1000 ft west of McKnight to 1000 ft east of Margaret. The project is currently scheduled to be let in February of 2007 with an anticipated construction start date of April 10, 2007.

A complete closure of Hwy 36 is being considered for this project. The goal is to have Hwy 36 open to one lane in each direction as soon as possible, with 4-lanes open by the end of the 2007 construction season. Mn/DOT believes this consideration will result in a safer work zone, higher quality of work, less project costs, and faster construction time.

Since a complete closure of Hwy 36 will have significant impacts to the public, Mn/DOT is asking AGC to assist in evaluating construction staging and project times. Mn/DOT would like to request one-on-one meeting with AGC members to review the proposed concepts and provide feedback.

Mn/DOT is looking for input with regards to:

- If Hwy 36 is closed, how long would it remain closed before at least one lane each direction could be opened (including the opening of one of the bridges over McKnight)?
- Would this time frame add significant cost?
- How should construction be staged? Should the contractor prepare staging and traffic control plans?

The project consists of:

- 400,000 yards of excavation (sandy loams) 200,000 of which is below the water table.
- 200,000 yards of embankment
- 70,000 yards of select granular borrow
- 4 Bridges (two on TH 36 over McKnight, one on Margaret over TH 36, and a ped bridge near the High School)
- 8000 ft of trunk storm sewer systems
 - local system may be constructed prior to closing TH 36 along south side
 - mainline is constructed within median
- Drainage blanket on TH 36 (see typical section)
- Building demolition
- Pond construction
- Retaining walls along the north side of TH 36 (24' +/- in height)
- Hwy 36 will be bituminous pavement
- Hauling across McKnight may be permitted with a temporary signal

It is also necessary to complete McKnight before school starts in the fall of 2007.



APPENDIX B – SAMPLE SUMMARY OF ITEMS DISCUSSED

Industry Review Suggestions

To better understand construction risks on this project, Mn/DOT solicited input from several potential contractors on 8/4/08 and 8/6/08. At the time of this input, the bridge type and final alignment were not known. Contractors were asked to provide “general feedback” on how Mn/DOT should approach utility relocation, permitting, and staging needs for various bridge types.

Other potential contractors are also welcome to provide input by contacting Steve Kordosky (steve.kordosky@dot.state.mn.us)

Utility Impacts

- Move transmission towers at least 50-100' from proposed bridge drip-line to allow for cranes.
- Overhead utility line on south-side will limit tie-back options for arch construction
- Raising the utility line along the south river bank is a better option compared to burying it. The new line should be at least 65'-100' above the new deck.
- Relocate power lines at the staging area west of the bridge

Bridge Construction

- Ask the Corp of Engineers for a minimum navigation width that must be maintained during the navigation season. Allowing full 540' width during construction will severely impact construction operations.
- Need 48 to 72 hour window to set a bridge that has been floated in
- Constructing an arch in-place is not probable if barges can't be placed in the water for falsework.
- Allow for different bridge types (prestressed, steel beam) on the approaches to the main river span.
- Launching beams on the approach spans will be difficult and will add cost.
- Need permission to dredge the river (need 10' min water depth)
- Consider a 60' swing radius for cranes near buildings and other obstructions

Staging Areas

- Causeway
 - Causeway needed on NW corner to build piers. Ideal if causeway could reach north pier on main span.
 - Causeway should be built about 5' above min normal water elevation
 - Causeway should be built to accommodate parking barges on NW corner
 - Allow for rip-rap and sheeting options on the causeway
- Staging Area (west of bridge near lock and dam)
 - Allow for piling to be driven and left in-place following construction
 - Allow contractor to raise the grade of the staging area to a certain elevation (3-5' above normal pool elevation).
 - Consider contract language that addresses flooding and impact on schedule
 - Allow sheet piling wall near shore for barges to park
 - Relocate power lines
 - Allow for some more trees along the shore to be removed



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Demolition

- Demo during winter (non-navigation) season
- Major risk with dropping the bridge (i.e. blasting) next to new bridge
- Stabilizing the bridge during demo will be a challenge

Risk

- Risk on arch and cable bridges are about the same
- Box has lowest risk
- Cable bridges will require about 1-year lead time for cable delivery
- Floating in a bridge with downstream current is difficult
- Determine who is responsible for debris removal on north side
- Extradosed type bridge is a high risk design