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Meeting Notes

Subject:	(241) and (243) Package Constructability Review Meeting
Client:	Iowa Department of Transportation
Project:	I-29 Sioux City Segment 2 Final Design
Project No:	IM-29-6(168)146-13-97
Meeting Date:	February 11, 2014
Meeting Location:	Ames, Iowa City Council Chambers
Notes by:	David Meier

A Constructability Review meeting involving contractor and construction industry representatives, Iowa DOT staff, and the consultant design team regarding the I-29 Sioux City Project was held on Tuesday February 11, 2014 at the Ames, Iowa City Council Chambers. The scope of the constructability review was the two roadway construction packages and four bridges involved in the project segment from a ¼ mile south of the BNSF Railroad overpass to just north of the Floyd River crossing.

For simplicity in these notes, the construction packages reviewed during the meeting will be referenced as follows:

- (196) Package – Southbound (SB) I-29 Bridge over Bacon Creek
- (241) Package – SB I-29 and bridge over the Floyd River
- (243) Package – Northbound (NB) I-29 and bridges over the Floyd River and Bacon Creek

A list of participants and contact information is at the end of the meeting notes.

Topics Discussed:

1. Meeting Background

The (241) package and both the SB I-29 bridges over the Floyd River and Bacon Creek were advertised in the January letting. Based on the bidder questions received and limited bidding response, the project was not awarded.

Approximately 35 questions and comments were received during the advertising period. Comments relating to constructability are categorized as follows:

- Construction access between bridges (5)
- Constructability (4)
  - Constrained work area (Area between the southbound bridges and existing northbound bridges)
  - Temporary causeway/stream crossing size
  - Available time to construct the staged bridges
- Drilled Shafts (7)
  - Full length shaft casing and rock socket lengths
  - Payment for shaft casings
  - Crane size vs. temporary causeway size

2. Response to Bidder Questions and Changes in Project Concept

The following decisions and revisions to the construction staging for the (241) and (243) packages have been determined in response to bidder questions on the (241) package:

- The (241) package as advertised had roadway and bridge staging to keep the SB Floyd Blvd entrance ramp and NB Floyd Blvd exit ramp open as much as possible. DOT has decided to close both ramps for periods during the (241) and (243) packages construction to reduce the amount of staging required and improve constructability.
- Construction access between the Bacon Creek and Floyd River bridges has been reviewed with consideration for construction equipment deceleration, acceleration and merging with I-29 traffic.
- DOT has determined that it will accept two-lane, two-way operation (TLTWO) on I-29 for longer periods of time. The original (241) package concept minimized the duration of single lane operations in any direction of travel. DOT expects long traffic queues with TLTWO during morning and evening peak periods.

3. Revised Project Constraints and Goals

DOT has established the following project constraints and goals for the revised (241) package and the (243) package:

- Traffic must not be in TLTWO over winter periods.
- Maintain two lanes in each direction as much as possible.
- Maintain interchange ramp access as much as possible.
- The existing sanitary sewer siphon across the Floyd River is in conflict with the NB Floyd River bridge foundation. The siphon is to be relocated prior to construction of the NB I-29 lanes, the (243) package. Not all of the required permits for the siphon relocation are currently in place. The siphon relocation may not be complete until March 2015.
- Construction of the SB and NB lanes is to be limited to a single construction year for each direction.
- Conditions of the US Army Corps of Engineers (USACE) Minor section 408 approval and the Section 404 permit require minimal waterway intrusion and fill earthwork in the Floyd River channel. The projects cannot be constructed with bridge pier foundations other than drilled shafts.

Discussion:

Question (Q): Will bridge construction over the 2015-16 winter be allowed?
Response (R): Bridge construction that would restrict traffic to less than two lanes in each direction on I-29 will not be permitted over the 2015-16 winter period.

4. Review of Revised (241) and (243) Package Staging Concepts – Two Alternatives

The DOT and design consultant reviewed the following two alternatives for sequenced construction of the (241) and (243) packages:

- Build SB First: Sequence of construction – (196)/(241)/(243)
- Build NB First: Sequence of construction – (196)/(243)/(241)

For both alternatives the (196) package will be let and constructed in 2014. The target letting for the (196) package is April, with a three week advertising period.

(196) Package

- Single stage of construction
- Entire SB Bacon Creek Bridge and approach slabs included with Interim pavement connections
- Traffic Configuration will be TLTWO with temporary barrier separation on the existing NB Bacon Creek Bridge. South traffic crossover to be located about 0.4 miles south of Bacon Creek and the north crossover just north of the construction site.
- Contractor Access:
  - No NB access.
  - Inbound/outbound access at the south end of project from the SB lanes, near the crossover location.
  - Inbound/outbound access at the north end of project from the SB lanes.

"SB First" Alternative

- (241) package Stage 1 – 2015 construction
  - Construction Activity: Three SB through lanes and outside shoulder; SB Floyd Blvd entrance ramp; All Floyd River SB bridge drilled shafts and columns, most of the pier cap, most of the girder lines and the majority of bridge deck.
  - Traffic Configuration: NB and SB traffic in TLTWO on existing NB pavement; NB Floyd Blvd exit ramp open; SB Floyd Blvd entrance ramp closed.
  - Construction Access: Access at south end of project from SB lane; Deceleration lane and gap in barriers provided for SB construction traffic between the bridge sites; North end project access via closed SB Floyd Blvd entrance ramp.
- (241) Stage 2 – 2015 construction
  - Construction Activity: SB inside shoulder and median barrier; Remaining pier cap, three lines of girders, deck and inside barrier on the SB Floyd River Bridge.
  - Traffic Configuration: Single-lane NB traffic on existing pavement; Single-lane SB traffic on new SB pavement
  - Construction Access: South end of project accessible from NB I-29; SB construction access lane between bridge sites; Existing and new pavement between NB and SB traffic; North end of project accessible from SB I-29
- (243) Package – 2016 construction
  - Construction Activity: All three NB lanes and both NB shoulders; NB Floyd Blvd exit ramp; Entire Bacon Creek NB Bridge; Entire Floyd River NB Bridge.
  - Traffic Configuration: Four-lane/two-way traffic configuration with both NB and SB traffic on new SB pavement; NB Floyd Blvd exit ramp is closed.
  - Construction Access: South end of project access from the NB lanes; NB outside lane closures for construction activities; Gaps in permanent barriers for construction access between bridge sites; North end project access via closed NB Floyd Blvd exit ramp.

"NB First" Alternative

- (243) Stage 1 – 2015 construction
  - Construction Activity: NB outside two lanes and outside shoulder; Entire Bacon Creek NB Bridge; Entire Floyd River NB Bridge; NB Floyd Blvd exit ramp.
  - Traffic Configuration: TLTWO on existing SB pavement; SB Floyd Blvd entrance ramp is closed; NB Floyd Blvd exit ramp is closed.

  - Construction Access: South end of project is open to NB construction traffic; Construction access lane provided between bridge construction sites with gaps in temporary barrier for access; North end of project accessible from closed NB Floyd Blvd exit ramp.

- (243) Stage 2 – 2015 construction
  - Construction Activity: NB inside lane and inside shoulder.
  - Traffic Configuration: SB traffic on existing SB pavement; NB traffic on new NB pavement; NB Floyd Blvd exit ramp is reopened, but SB entrance ramp remains closed.
  - Contractor Access: South end of the project is open; new and existing pavements along project extents behind temporary barrier are available for access; North end of the project is accessible from SB I-29 around the end of temporary barrier.
- (241) Package – 2016 construction
  - Construction Activity: Entire SB side pavement section; SB Floyd Blvd entrance ramp; Entire Floyd River SB Bridge.
  - Traffic Configuration: Four-lane/two-way configuration on the new NB pavement; NB Floyd Blvd exit ramp is open, but SB entrance ramp remains closed.
  - Construction Access: South end of project is accessible from SB I-29; SB outside lane may be closed for construction access with gaps in proposed barrier provided for access; Access to north end of project provided from closed SB entrance ramp.

Discussion:

Q: Will lane closures be allowed only at night?
R: Lane closures will not be restricted to overnight. However, construction activity will be a requirement for approval of all lane closures.

Comment (C): Providing a deceleration lane between I-29 traffic and the construction zone is a big improvement in constructability.

C: The project is "doable" with these improvements.

Q (DOT): Do the described package staging revisions improve construction access?
R: Overall agreement that the revisions described would improve construction access.

Q (DOT): Is the SB Bacon Creek bridge construction schedule manageable, assuming a May start and December finish?
R: The 2014 proposed work will be easier to accomplish than the 2015 proposed work.

C: Completing the SB Bacon Creek Bridge prior to the 2015 construction is "huge".

C: Setting bridge girders in Stage 2 of the (241) package will be an issue.

Q: Will DOT provide guidelines on use of the new SB Floyd River Bridge by cranes to set the Stage 2 girders (i.e. constraints on crane positions, deck protection)? Guidelines will be needed at bid time.
R: DOT will have its consultant look at potential guidelines or requirements regarding setting the Stage 2 girders. Should a 100-ton crane be assumed for consideration?
C: Anticipate a 100-ton crane at each end of the girder.
C: Suggest 180,000 lb/crane with 30 to 35-ft reach.

C: Redesign the SB Floyd River Bridge to accommodate anticipated crane loads.

Q: Will a 12-inch timber mat alleviate punching concerns on the new bridge deck?
R: Yes.

Note: See Section 6 of these notes – Post-Constructability Review Decisions

C: Twenty-minute duration lane closures for picking and setting bridge girders is inadequate.
C: Nighttime work can address the lane closure duration issue.

C: Contractors will have equipment issues with the 20-ft wide construction platforms shown parallel to the piers in the temporary causeway layout in the (241) package. A 30-ft wide platform is needed to accommodate 100-ton cranes with outriggers set.
C: A thirty foot wide platform is an absolute minimum.
C: Bench the area from abutment to abutment at a flat elevation.

C: The south Bacon Creek bank has eroded and is not as shown on the plans.

C: At Bacon Creek, the contractor may need to get some of the girders across the temporary stream crossing to pick and set them from the outside. The top of the temporary stream crossing must be no less than 30 feet wide.

Q (DOT): Will drilled shaft contractors set the reinforcing cages for the shafts themselves?
R: It depends on the whether the General Contractor has equipment capable of handling the cages. If the shaft contractor needs to set the reinforcing cages, it will add cost to the bid.
C: Normally, reinforcing steel cages are placed in two pieces and spliced while the upper cage is held by a crane. With the instrumentation required, the cage for the test shaft must be one piece.

Q (DOT: Is there enough flow in the Floyd River to construct the drilled shafts from a barge?
R: No, at least not when the shafts would be under construction.

Q: Will a load test be conducted on the Floyd River test shaft only?
R: DOT will add a load test to the Bacon Creek test shaft.

Q/C: Why abandon the test shafts? Load test shafts are commonly incorporated in production shafts by other agencies, including the Nebraska Department of Roads.
C: The Bacon Creek shafts are simpler than those at the Floyd River, smaller diameter, smaller size reinforcing steel and without mechanical splicers.
C: Separate site test shafts are typically addressed in a separate, early construction package.
R: DOT wants the Bacon Creek test shaft at a separate location. The load test/test shaft is a non-production shaft because the DOT prefers to load the shaft to failure to provide design data for future drilled shaft designs.

C: The two-week time period between the test shaft load test and the determination of final rock socket lengths is excessive.
R: DOT will consider cutting the review period in half to one week.

C (DOT): Potential construction access to the NB lanes and bridges from Lafayette Street is in discussion with the City of Sioux City.

C (DOT): DOT is considering a tie between the (241) and (243) packages and all bridges except the SB Bacon Creek to achieve better control over the construction site over the 2015-16 winter. If the packages are not tied, the (243) package will probably be let in June for construction beginning the following year.
C: Keep the packages together. They are too intertwined to be separate.
C: A tied package will remove some contractors from bidding.

Q: If the packages are not tied, what happens if the 1st contractor does not complete the work on time?
R: Other project packages are currently scheduled for FY 2016 lettings, including NB lanes segments from the Floyd River to Wesley Pkwy and from Wesley Pkwy to Hamilton Blvd. The sequencing of those packages is under review.

Q: Will 1"=10' scale versions of the "J" sheets be available at time of letting?
R: The scrolls used for today's Constructability Review are 1"=50' scale.

C: 1"=50' scale would be OK.
R: DOT will take it under advisement to make 1"=50' scale scrolls of the "J" sheets available when the packages are advertise for letting.

Q: What type of traffic control will be used to keep public traffic out of the contractor access lane shown on the staging scrolls?
R: Traffic cones are anticipated.

Q: The SB Floyd Blvd entrance ramp is planned to be closed for two construction seasons?
R: Yes. Part of the reason DOT is willing to close Floyd Blvd ramps for longer durations during construction of the (241) and (243) packages is that by 2015 the Gordon Drive package will be constructed.

Q: For the NB 1st alternative, how will drainage be handled?
R: For this staging alternative, drainage design would need to be revisited. An additional trunk line may be necessary and boring certain pipes is likely.

Q: Would lane drops be allowed during the day during the SB lanes construction in the NB 1st alternative?
R: Yes.

Q: Is completion of the sanitary sewer siphon relocation a risk for the NB 1st alternative?
R: Yes. Railroad clearance for the sanitary sewer under crossing of the spurs to Nutra-Flo is still needed. Additional design effort will also be needed if the NB 1st alternative is selected.

C: It sounds as though the DOT does not prefer the NB 1st alternative.

C: Shift the Stage 2 bridge construction from the (241) package to the (243) package for the SB 1st alternative.

Q: What is the benefit of tying the (241) and (243) packages?
R: Expected benefits from tying the packages are continuity of construction activity and limiting the impact to the DOT construction program by committing dollars for both packages in 2015.

Q (DOT): If the packages are tied and incentives provided, could the contractor reduce impacts to traffic operations?
C: The use of lane rental is OK, but the contractor must be working every day.
Q (DOT): Are there other options that should be considered?
No response comments noted.

Q (DOT): Which staging alternative is preferred by contractors, SB 1st or NB 1st?
Several comments favoring the SB 1st alternative.

5. Drilled Shaft Discussion

The DOT Office of Bridges and Structures provided information regarding the drilled shaft foundations for the Floyd River and Bacon Creek bridges to Ron Otto of AGC/Iowa. The following discussion pertains to issues regarding the shafts that were noted by contractors during the (241) package bidding period:

C (DOT): A load test will be added to the Bacon Creek test shaft.

Q: Will full-depth shaft casing be a contractor option?
R: No, full-depth casing will be required to eliminate risk.
Q: Will full-depth casing be required for the load test shafts also?
R: Yes.
C: Requiring full-depth casings will add a lot of cost to the project.
Q: Are full-depth casings being required because of the drilled shaft design?

R: No, the shaft designs will need to be revised to reflect reduced skin friction capacity due to full-depth casings.
C: Installing full-depth casings will not be a problem, but will require additional time.
C: Use of full-depth casing should be a contractor option, if not required by design

Q: Is full-depth casing allowed in the current drilled shaft design?
R: Yes, however the rock socket length is impacted by the length of casing.

Q (DOT): Would contractors prefer to bid the shaft length with incidental costs included?
R: Yes.
C: If full-depth casing is not required, then no bid item for casing is needed. If casing is required, then a casing bid item should be included.

Q (DOT): Is optional casing preferred?
Opinions differed among drilled shaft contractors present.
C: Drilling fluids in use do not soak in and impact friction along the length of the shaft.

Q (DOT): Is the granular layer shown in the Floyd River crossing borings a concern?
C: If a shaft wall partially collapses, drilling that shaft will have to start over.

C (DOT): The objective is to have everyone bidding the same thing.
C: With the opportunity for value engineering, contractors are not necessarily bidding the same thing.

Q: Will drilled shaft contractors be prequalified for bidding? Neighboring states such as Wisconsin do so.
R: DOT will consider prequalification of drilled shaft contractors.

C: DOT should use the load test shaft to determine if the 24-hour requirement for drilling the rock socket, air-lifting the shaft, and setting the reinforcing cage is feasible. Don't think those tasks are possible in a 24-hour period.
C: DOT should request information from slurry providers regarding potential impacts to the shale from the slurry.

Q (DOT): Is high water a concern at the Floyd River for construction of the drilled shafts?
C: Drilled shafts are the only way to go because they remove the risk associated with variable water level in the Missouri River.
C: The shafts require a lot of reinforcing steel (significant cost).
Q: Is the USACE more receptive to pile foundations if constructed during low flow periods?
R (DOT): Winter bridge construction would impact I-29 traffic during Stage 1 (TLTWO traffic) which is not an option the DOT will allow.
C: H-piles, cofferdams, and winter construction would save a lot of construction cost.
Q (DOT): How will contractors control the high water risk?
R: Leave the top of the permanent casing long and torch-cut the casing to the finish elevation.
C: The top of causeway elevations should be the determinant for when high water prevents work.

C (DOT): Constructability Review Meeting notes and the staging alternatives scrolls will be placed on the DOT website for contractors.

6. Post-Constructability Review Decisions

A post-Constructability Review meeting was conducted at the Iowa DOT headquarters, involving DOT management, staff and design consultant team. The decisions listed below were made by DOT. These decisions are based on design information and construction staging concepts as of February 11, 2014 and may not be reflected in revised final plans:

- ***The SB 1st Alternative was selected - SB I-29 lanes will be constructed following the SB Bacon Creek Bridge and prior to the NB lanes (243) package.***
- ***The (241) and (243) packages will be merged into a single construction package that will be identified as the (241) package.***
- ***Setting girders for Stage 2 of the SB Floyd River Bridge construction from the portion of the bridge completed in Stage 1 will not be permitted. DOT does not want loads greater than legal highway loads on the new SB Bridge. The staging plans will be developed to allow the option of setting the girders from the existing NB Floyd River Bridge deck or from the ground following demolition of the existing NB Bridge.***
- ***Use of full-depth, permanent casing for the drilled shafts will be at Contractor's discretion.***
- ***Load test shafts shall be constructed in the same manner as the Contractor plans to construct the production shafts (including the use and length of permanent casing).***
- ***Bid Items for the drilled shafts will remain the shafts and reinforcing steel.***
- ***Final rock socket lengths will be determined from the test shaft results (which could be either longer or shorter than the design length).***
- ***Payment for the shafts will be made on measured quantities in the field - resulting in savings if rock socket depths can be reduced.***
- ***All bids will use the same quantities based on drilled shaft lengths without full-depth casings.***
- ***A tabulation of design rock socket depths for full-depth casing will be provided.***
- ***Cores obtained by the Iowa DOT for the SB Bacon Creek Bridge project will be available for viewing at the Iowa DOT's central complex located at 800 Lincoln Way in Ames on April 9 and 10, 2014. Cores may be viewed between the hours of 10:00 AM and 2:00 PM each day. Interested parties must obtain a visitor's pass at the main entrance on the east side of the complex, and wear appropriate Personal Protective Equipment (PPE) provided by the Iowa DOT while in the viewing area. The cores will be displayed in an area near the materials lab loading dock.***

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