



INTEROFFICE MEMO

TECHNICAL SERVICES
Bridge Engineering Section
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DATE: April 20, 2014

TO: Craig Shike
Bridge Standards Managing Engineer

FROM: Scott Liesinger Phone#: 503-986-4324
Bridge Design Managing Engineer
ODOT

SUBJECT: Proposed Revision to Bridge Design & Drafting Manual

RE: BDDM Section 3.3 – Bridge Design Process Overview

Problem Statement:

At the BDDM presentations to the Bridge Design personnel edits were identified that would clarify or improve the Bridge Design Process section.

Proposal:

Modify Section 3.3 as follows

3.3 Bridge Design Process (Design-Bid-Build), Overview

Outline:

[3.3.1 Scoping](#)

[3.3.2 Project Initiation \(Kick-Off\)](#)

[3.3.3 50% ~~Preliminary Design Phase~~TS&L \(Proof of Concept Plans\)](#)

[3.3.4 TS&L Report](#)

[3.3.5 Design Acceptance Plans Package](#)

[3.3.6 Preliminary Plans Package Milestone](#)

[3.3.7 Advance Plans Package Milestone](#)

[3.3.8 Final Plans Package Milestone](#)

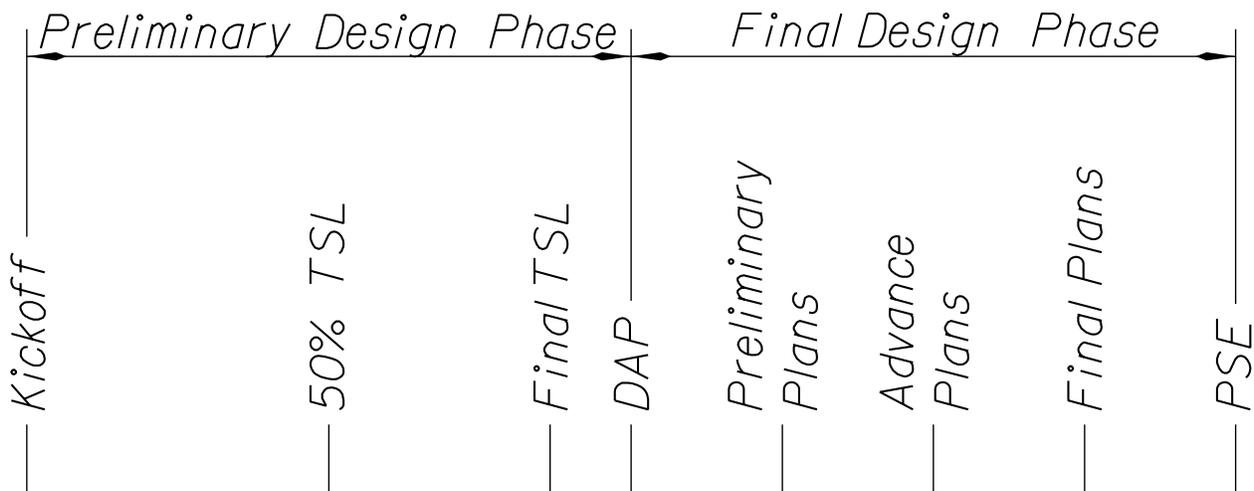
[3.3.98 PS&E Milestone](#)

[3.3.109 Bridge Design Close-Out](#)

3.3.1 Scoping

The Project – Scoping involves a reconnaissance level look at one or more alternatives for a project. It involves more planning, conceptual design, and description than the project-level design performed after STIP programming. This level of planning assists in securing funding levels and determining ‘Level of Effort’ required by the various work units. Site constraints are identified, and assumed or known design exceptions or deviations are noted, as well as anticipated outsourcing of work.

Bridge Design – Potential Bridge Program projects are initiated by the Bridge Program Unit from queries run on the State’s Bridge Data. A ‘Desk Scope’ is completed, and a Bridge Scope Memo drafted (See [Appendix Section 3.3](#)). This information is then sent to the Region for ‘Field Scoping’. After the Region Scoping Team has performed the ‘Field Scope’, it is sent back to the Bridge Program Unit for review and reconciliation, and the final Bridge Scope Memo prepared. The final Bridge Scope Memo is then sent back to the Region Area Manager for assignment to a Project Leader after STIP programming, and eventually Project Initiation. Also see [Highway Division Directive DES 01](#).



3.3.2 Project Initiation (Kick-Off)

The Project – Project Initiation is the point in time in which the project is ‘kicked off’ by the Project Leader. Final refinements to the scope, schedule and budget should occur at the ‘Kick off’ Project Team meeting.

Bridge Design – A few weeks prior to a project’s kick-off, the Reviewer, Designer and Checker assignments are verified by the Bridge Design Manager. The Reviewer then meets with the Bridge Designer to review the Bridge Scope Memo; the project’s scope, schedule and budget; and to prepare for the Project Kick-Off Meeting. The Bridge portion of the Region Quality Plan is also reviewed at this time, and supplemented to cover any project specific needs. Also see [PDLT Operational Notice PD-02](#).

3.3.3 50% Preliminary Design Phase TS&L (Proof of Concept Plans)

The Project – Concept Plans consists of enough detail to “proof” the project concept that has been put forth. Site constraints are identified, and alignments should be close to final. Consider permanent and temporary traffic control, and note specialty specification items. Cost estimates should include many of the bid items.

Other work that should be complete at this stage include: survey control established, survey topography gathered, survey base map produced, existing right of way determined, environmental base map produced, Area of Potential Impact (API) identified, draft utility conflicts identified, horizontal and vertical alignments calculated, bridge bent locations set, retaining wall locations set.

Bridge Design – The Alternatives Study and a rough draft of the TS&L Narrative should be complete and ready to review with the Reviewer. Perform a Bridge Design Standards Assessment and create a list of design deviations for each alternative. The Engineer’s Estimate @ TS&L should include the “significant cost” bid items. A draft TS&L Plan Sheet may be prepared to include with the other project Concept Plans; coordinate need with the Project Team.

3.3.4 TS&L Report

The Project – Is nearing the Design Acceptance Plans (DAP) milestone.

Bridge Design – The TS&L Report (consisting of the Alternatives Study, TS&L Memo or Narrative, TS&L Plan Sheet, Engineer’s Estimates, and Design Deviations/Exceptions) is complete, has been reviewed and approved by the Bridge Reviewer, and is ready to publish in the DAP. Submit TS&L Report to the Project Leader.

3.3.54 Design Acceptance Plans Package

The Project – Design Acceptance Plans (DAP) provide sufficient detail of project elements and staging to identify right of way and utility impacts, utility relocation needs, and to allow application for permits. Staging should be complete except for minor details. Write specialty specs with enough detail to give reviewers an idea of the work and pay items involved. Cost estimates should include most of the bid items, although quantities will not be accurately calculated at this time.

At this milestone, alignments are final and the project ‘footprint’ is set; right of way, utility and environmental impacts are known. Changes after this stage has been completed should be seldom needed, and the work after this stage is adding detail and refining the design. Each project team member should review others’ DAP deliverables to ensure the work is compatible between disciplines, and there are no discrepancies.

Roadway will often take the lead on common products, such as distributing the DAP and compiling a complete cost estimate. Roadway may produce a Design Narrative that incorporates all sections’ commentaries. Reference may be made to other complete documents, such as the Bridge TS&L Report, providing only minimal data in the Design Narrative for such sections.

Some items that should be done at or just after the DAP milestone include:

- Bridge: Alternatives Study, TS&L Report, Approved Design Deviations, Information for permits
- Roadway: Approved Design Exceptions, Project Narrative, DAP Cost Estimate
- Geotechnical: Preliminary Geotechnical recommendations documented
- Hydraulics: Hydraulic recommendations and plans

Bridge Design – The TS&L Report (consisting of the Alternatives Study, TS&L Memo or Narrative, TS&L Plan Sheet, Engineer’s Estimates, and Design Deviations/Exceptions) is complete, has been reviewed and approved by the Bridge Reviewer, and is ready to publish in the DAP. Submit TS&L Report to the Project Leader. Respond to any needs identified by the Project Leader. Attend the Design Acceptance Workshop (DAW), if scheduled.

3.3.65 Preliminary Plans Package Milestone

The Project – Preliminary Plans incorporate adjustments that are needed due to further refinement with right of way, utility, and permitting negotiations that have occurred. Decisions affecting the footprint of the project should be made by this time. All plan sheets should be started and included in the review package. Include boilerplate special provisions (i.e., compilation of boilerplate special provisions straight from the ODOT webpage; without “refining” work). Cost estimates are to include all bid items with a rough-calculated quantity. Each project team member should review others’ Preliminary Plans deliverables to ensure the work is compatible between disciplines, and there are no discrepancies.

Some items that should be done at or just after the Preliminary Plans milestone include:

- Bridge: Progress Plans, Cost Estimate, List of anticipated special provisions
- Roadway: Progress Plans, Bid Summary/Cost Estimate
- Geotechnical: Draft Geotechnical Report
- Hydraulics: Draft Hydraulics Report, Storm Water Management Plan
- Environmental: Obtaining permits is continuing during this phase
- Utilities: Work with utility companies to establish utility relocations

Bridge Design – Start structural analysis calculations and prepare “preliminary” construction plans. All plan sheets should be started and prepared to approximately 50% complete, showing the basic geometry of all major elements. Identify boilerplate special provisions to include in the Preliminary Plans Package using SPLIST. Complete the Engineer’s Estimate @ Preliminary Plans including all bid items with a rough-calculated quantity. Provide bridge deliverables to the Project Leader for inclusion in the Preliminary Plans review package.

3.3.76 Advance Plans Package Milestone

The Project – Advance Plans include all items necessary to bid and build the project. Complete special provisions, including specialty special provisions. Complete cost estimates, including a complete itemized list of bid items and calculated quantities. Each project team member should review others’ Advance Plans deliverables to ensure the work is compatible between disciplines; and review the entire plan set for clarity and consistency.

Some items that should be done at or just after the Advance Plans milestone include:

- Bridge: Advance Plans, Cost Estimate, Special Provisions, Construction Schedule
- Roadway: Advance Plans, Cost Estimate, Special Provisions, Construction Schedule
- Geotechnical: Stamped Geotechnical/Foundations Report
- Hydraulics: Stamped Hydraulics Report, stamped Storm Water Management Plan
- Environmental: Obtaining permits may be continuing during this phase

Bridge Design – Complete structural analysis calculations and prepare “advance” construction plans. Prepare plan sheets to approximately 95% complete, including all geometry and details necessary for bidding and construction. Complete draft special provisions, and Engineer’s Estimate @ Advance Plans, including accurately calculated quantities. Complete the Engineer’s Estimate of Probable Construction Schedule. Provide bridge deliverables to the Project Leader for inclusion in the Advance Plans review package. Provide bridge deliverables to the Bridge Checker for detailed structural QC check.

3.3.87 Final Plans Package Milestone

The Project – Final Plans consist of printing and signing final prints of the design work and finalizing the PS&E package.

Some items that should be done at or just after the Final Plans milestone include:

- Bridge: Final Plans, Cost Estimate, Final Special Provisions, Final Construction Schedule

- Roadway: Final Plans, Cost Estimate, Final Special Provisions, Final Construction Schedule
- Environmental: Approved permits

Bridge Design – Address comments from the detailed structural QC check and other reviews. Finalize structural analysis calculations and prepare “final” construction plans. Complete plan sheets (100%). Complete final special provisions, final Engineer’s Estimate of Probable Construction Schedule, and Engineer’s Estimate @ Final Plans. Provide bridge deliverables to the Project Leader for inclusion in the Final Plans package. Also see [PDLT Operational Notice PD-02](#) and [Final PS&E Submittal Checklist](#), and ensure the Bridge-related aspects of this Notice are complete.

3.3.98 PS&E Milestone

The Project – PS&E is the point in time of the project in which all the contract documents prepared by the Project Team are submitted to the Office of Project Letting by the Project Leader to begin the process of advertising and bid letting.

Bridge Design – Complete (to this point in time) the structural analysis calculation book(s). Make a pdf of the calculation book and submit to Reviewer. Assist the Project Leader to address any PS&E Package deficiencies before Advertising; and to address any RFIs and Addendum Letters during Advertising. Prepare bridge load rating.

3.3.109 Bridge Design Close Out

Bridge Design – Within 60 days after Award, complete ‘Bridge Design Close-Out’ documents, and ensure all Bridge Quality documents are received and retained in the Bridge project file system.

Analysis / Research / Other Supporting Data:

- None
- Attached:
 - [name of attachment]
 - [name of attachment]

[and/or enter text here]

Bridge Engineering Section Response:

<input type="checkbox"/> Accepted for consideration as submitted		
<input type="checkbox"/> Accepted for consideration as noted		
<input type="checkbox"/> Proposal tabled, see Remarks		
<input type="checkbox"/> Proposal not accepted, see Remarks		
Remarks:		
[name of reviewer] Bridge Design Standards Reviewer		Date
Craig Shike Bridge Standards Managing Engineer		Date

Cc: file