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1. Introduction

This document outlines the standard operating procedures for Alternate Prestressed Bent and Abutment Designs submitted by a Contractor after the project lets for construction.

The main objectives of this document:
- Describe roles and responsibilities
- Establish the procedures for submitting an Alternate Prestressed Bent or Abutment design.
- Describe the procedures for reviewing Alternate Prestressed Bent or Abutment plans.
- Describe the procedures for verifying Alternate Prestressed Bent or Abutment design calculations.
- Provide guidance for shop plan submittal of Alternate Prestressed Bent or Abutments.

Please direct any questions on the content of this document to the Bridge Division Director, Texas Department of Transportation.
2. Procedure for Submitting Prestressed Bent and/or Abutment Cap Alternate Designs

2.1. Meet with the TxDOT District Project Manager (PM) and Submit Official Request

Contractor’s Project Manager meets with the TxDOT District PM and gains District approval for their Alternate Design Concept.

Contractor must submit an official request to the TxDOT District PM for the Alternate Design Concept which includes:

- Clear indication of the structural elements that are impacted by the Alternate Design Concept
- Justification for the benefit to TxDOT that the Alternate Design Concept will provide.

2.2. Alternate Design Development

After the concept is approved by the TxDOT District PM, the Contractor develops the Alternate Design Package, consisting of alternate plans and supporting design calculations.

2.2.1. Alternate Design Plans

- Required to be signed and sealed by a licensed Engineer in the state of Texas.
- Required to be signed and sealed by a precertified consultant in work categories 5.1.1 Minor Bridge Design or 5.2.1 Major Bridge Design. See Section 4 for consultant precertification information.
- Required to be a complete design and include all of the following information:
  - Material Notes
  - Complete Reinforcing Schedule and details
  - Provide the Design Loading (typically HL93)
  - Identify the AASHTO LRFD Bridge Design Specification used for the design. This should be the same edition of the AASHTO LRFD Bridge Design Specification used in the original design. This is important so that the entire bridge is following the same design specification.
  - Construction notes (if necessary depending on particular case)
  - General Notes
  - Other necessary items depending on specific condition
- Include title blocks that are formatted similar to that of the original plans.
- Shop drawings are not acceptable as Alternate Plans.
2.2.2. Alternate Design Calculations

- Must be signed and sealed by a precertified consultant as in the Alternate Design Plans requirement in 2.2.1.
- Must follow the same edition of the AASHTO LRFD Bridge Design Specifications and edition of the TxDOT Bridge Design Manual as the original design.

2.3. Submittal to District

Next, the Contractor submits formal Alternate Design package to the TxDOT District PM.

- The TxDOT District PM verifies that the Alternate Design Consultant signing the plans and calculations is precertified in TxDOT Bridge Categories 5.1 Minor Bridge Design or 5.2 Major Bridge Design.
- If the Alternate Design Consultant is not precertified in the categories previously stated, then the TxDOT District PM notifies the Contractor that the Alternate Design package is rejected.

2.4. Review of Alternate Plans and Calculations

2.4.1. Reviewer

The TxDOT District Project Manager will send a request for approval of the alternate design to the Engineer of Record (EOR) of the original design.

- If the EOR is a Consultant, this review would be paid for under the Work Authorization Construction Phase Services.
- In cases which the EOR is a Consultant with a terminated (expired) contract or the contract doesn’t include Construction Phase Services, TxDOT District PM forwards alternate design review package to Bridge Division Design Section Director for review. Please allow up to 20-25 working days to review depending on complexity and the number of alternate designs and bridges.

2.4.2. Review of Plans

The Reviewer, as determined in 2.4.1, reviews the plans.

- Once review is complete, the reviewing party will place an official stamp on the Alternate Plans (Approved, Approved Except as Noted, or Return for Correction) and submit back to the TxDOT District PM.
- If the returned review is marked as Return for Correction, the submittal/reviewing process will cycle through until the Alternate Plans are approved.
- All official submittals and reviews must travel through the TxDOT District PM.
2.4.3. Review of Calculations

- The Reviewer, as determined in 2.4.1, will verify that the Calculations were designed according to the same AASHTO LRFD Bridge Design Specification used for the original design.
- The Calculations will then be stamped “RECEIVED” and dated.
- An email is sent to the Alternate Design Consultant, notifying them that the calculations were received and that the correct AASHTO LRFD Bridge Design Specification has been verified. The TxDOT District PM is copied on this email.
- The TxDOT District PM sends calculations to BRG_Design_Notes@txdot.gov according to the Procedure for Archiving Bridge Design Notes Memo (Dated 08-06-2014). See Appendix A for copy of memo.

2.5. Notification

If the Alternate Plans are approved, TxDOT District PM notifies Contractor PM with approved copy of Alternate Plans.

2.6. Filing of Alternate Plans

TxDOT District PM ensures that approved Alternate Plans are filed with contract plans so that the as-built plans are accurate.

2.7. Shop Plans

TxDOT District PM informs the contractor who/where to send the shop drawing submittals for review. Contractor submits shop plans according to the Guide to Electronic Shop Drawing Submittal located at http://www.txdot.gov/inside-txdot/division/bridge/specifications/shop-drawings.html. Do not submit shop plans prior to Alternate Design submittal being approved.

- TxDOT District PM or designated District shop drawing contact forwards the shop drawings to the EOR of the Alternate Design or determines the appropriate party to review the shop drawings.
- EOR of Alternate Plans for the prestressed abutment/bent reviews submitted shop plans against the approved Alternate Design Plans, which should now be in the contract plans file.
  - Once review is complete, the reviewing party will place an official stamp on the Alternate Plans (Approved, Approved Except as Noted, or Return for Correction) and submit according to reviewing office. Information for each District is located at http://ftp.dot.state.tx.us/pub/txdot-
info/library/pubs/bus/bridge/shop_plan_contacts.pdf. Make sure the TxDOT District PM is copied on the email submittal.

- If the returned review is marked as Return for Correction, the submittal/reviewing process will cycle through until the Shop Drawings are approved.

- From this point on, shop drawing submittal/review/approval process follows the typical procedure.
3. Definitions

**Alternate Design Engineer of Record (EOR)** – This is the EOR, who is licensed in the state of Texas, that works for the Alternate Design Firm that the contractor hired to design and create plans for the alternate prestressed bent and/or abutment cap.

**Bridge Division** – TxDOT Division that can assist with questions and handling of Alternate Prestressed Bent or Abutment Designs.

**District** - The TxDOT District that the project has let in that the contractor has submitted a Prestressed Bent or Abutment Alternate Design.

**Original Contract Plan Sheets** – These are the plan sheets approved by the Engineer, including true reproductions of the drawings that show the location, character, dimensions, and details of the work and are a part of the project construction Contract.

**Original Engineer of Record (EOR)** – This is the EOR, who is licensed in the state of Texas, that originally designed the bent or abutment cap that is included in the contract plans that the contractor bid on.

**TxDOT District Project Manager (PM)** – This is the primary representative for the District that serves as the main point of contact for the project. For example, this person could be the Area Engineer or designee.
4. Consultant Precertification Information

Information on becoming precertified is located at:

A. Appendix A: Procedure for Archiving Bridge Design Notes

MEMO
August 6, 2014

To: District Engineers
From: Gregg A. Freeby, P.E.
Division Director, Bridge Division
Subject: Procedure for Archiving Bridge Design Notes

In order to comply with FHWA requirements for maintaining records, the Bridge Division is implementing a procedure for archiving bridge design notes in TxDOT's bridge inspection database management system. Beginning with all designs initiated on September 1, 2014 and later, perform the following procedure when a design is complete.

Procedure for TxDOT employees:

1. Scan the notes (or convert electronic files) and gather them into a single PDF file. Create separate PDF files for each bridge. In the case of a single design done for twin structures, submit the same notes under two separate NBI numbers.
   a. Refer to Figure 6: Guidance for Calculation Retention in the Bridge Division's Quality Control and Quality Assurance Guide at http://ftp.dot.state.tx.us/pub/bdot-info/library/pubs/bus/bridge/qaqc_guide.pdf for the design elements that are required and how to assemble the PDF file.
   b. Additionally, the file should contain:
      ii. Bridge layout at the time of the original design
      iii. Communication directly related to the included elements
   c. Do not include bridge geometry runs (BGS, Geomath, spreadsheets, etc.).

2. Name the file using the following naming convention:
   a. Design notes: NBI_DN_yyy-mm, with yyy-mm being the year and month the PDF file is submitted (ex. 1234567890abcdef_DN_2015-01)
   b. Change Orders: NBI_CO_yyy-mm (ex. 1234567890abcdef_CO_2015-01)

3. Deliver the PDF file using DropBox, at https://ftp.dot.state.tx.us/dropbox/
   a. Select Drop-off.
   b. Enter Sender Information.
   c. Enter Recipient Information (use email: BRG_Design_Notes@txdot.gov)
   d. Attach the design notes PDF file.
   e. Select Drop-off the File(s).
Once the file has been uploaded, the auto-generated email will serve as notification to the Bridge Management Group (currently Tom Yarborough, Dean Loitz, and Juan Paredes) that files have been received. The Bridge Management Group is responsible for transferring the files into TxDOT’s bridge inspection database management system, where they will become part of the permanent bridge file.

Procedure for Consultant designers:

1. Follow Steps 1 and 2 shown above. Consultants are allowed to use their own cover sheet if it is similar to the Quality Control Cover Sheet from the Quality Control and Quality Assurance Guide at http://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/qa_qe_guide.pdf.

2. Send the PDF of bridge design notes to the TxDOT contract manager or the District Bridge Engineer, who will submit the notes using Step 3 shown above.

For questions or comments concerning this guidance, please contact John M. Holt, P.E., at John.Holt@txdot.gov or (512) 416-2212.

CC:  
Federal Highway Administration  
Bridge Design Consultants  
Administration  
Division and Office Directors  
Directors of Transportation Planning and Development  
District Bridge Engineers  
Bridge Division Employees