

Section 10.10

BRIDGE CONSTRUCTION ISSUES THAT MUST INVOLVE OFFICE OF CONSTRUCTION STAFF

10.10.1 Purpose

The purpose of this section is to make Construction Engineering and Inspection (CEI) personnel aware of the bridge construction project issues that must be addressed or resolved with the involvement of the State Construction Office (SCO) State Construction Structures Engineer (SCSE) and to present procedures that prescribe that involvement.

10.10.2 Authority

Section 20.23 (3) (a), Florida Statutes

Section 344.048 (3), Florida Statutes

10.10.3 Reference

FHWA Approved: March 18, 2009

Section 336.045, Florida Statutes

10.10.4 General

To ensure quality bridge construction, there are times at which the SCO must be involved with resolution of complex issues. This procedure describes the types of bridge issues that require SCO involvement as well as how SCO involvement shall take place.

10.10.5 DEFINITIONS:

Design Category 1 (C1) – All bridge member designs that are not defined below as C2 and that in general are common and routine designs for bridges that have uncomplicated structural members. For a detailed definition of C1, see *Florida Department of Transportation, Plans Preparation Manual Volume 1, Section 26.3.1*.

Design Category 2 (C2) – C2 bridge are those with designs that have the complicated or unique structural members that follow: steel box girders, curved steel plate girders, continuous straight steel plate girders with span lengths equal to or greater than 170 feet, cast-in-place concrete box girders, concrete segmental box girders, continuous post-tensioned spliced concrete beams with or without pretensioning, steel truss members, cable stayed structures, movable span members, post-tensioned substructure members, vessel collision designs and any members with design concepts, components, details or construction techniques with a history of less than five (5) years of use in Florida. The C2 definition also appears in the FDOT *Plans Preparation Manual Volume 1, Section 26.3.2*.

10.10.6 Design Category 1 Members

Involvement by the SCSE is not usually required for C1 bridge construction issues or issues that are covered by *CPAM Sections 10.10.7.1 thru 10.10.7.3*. When these issues arise on a project, the CEI staff shall consult with the Engineer of Record (EOR) for design issues and bridge engineers in the following District offices, whether design or construction issues, as appropriate: District Construction, District Structures Design, District Materials and District Structures Maintenance. The District Structures Design Engineer must be given the option of reviewing any EOR recommendation, by an EOR established deadline, prior to finalizing any response back to the Contractor and CEI staff must verify that this takes place. The District Structures Design Engineer's failure to concur on or before the deadline, unless an extension is requested, shall signify that the District Structures Design Engineer chooses not to review. If engineers in these District offices are unable to address or resolve an issue then CEI staff should contact the SCSE for assistance and the procedures that prescribe SCSE involvement shall be the same as for C2 members as set forth in *CPAM Section 10.10.7*. Bridges often have both C1 and C2 members, for example, the superstructure has long span curved steel box girders that are C2 members and the substructure has cast-in-place concrete columns that are C1 members. When this is the case, *CPAM 10.10.6* shall be used for C1 issues, with the stated exceptions, and *CPAM 10.10.7* shall be used for C2 issues.

10.10.7 Design Category 2 Members

CEI staff shall resolve issues that follow in *CPAM Sections 10.10.7.1 thru 10.10.7.3* with coordination from the EOR and SCSE. The SCSE will address complex construction issues directly and make recommendations back to the CEI staff for resolution. Obtain EOR input on complex issues either prior to or concurrently with SCSE input.

10.10.7.1 Contractor Initiated Changes for Complex Superstructure Members and Complex Issues

When a Contractor proposes a change to the plans, shop drawings, specifications or means and approved methods plans (segment erection plans, post-tensioning plan, grouting plans, etc.) that are related to complex superstructure members or complex issues, the SCSE and the EOR, shall be informed of the Contractor's intent. If possible, this should be done prior to a formal submittal from the Contractor to allow the Department to provide a preliminary response regarding acceptability of the proposal. For design related proposals, the EOR shall be the initial point of contact with confirmation to be provided from the SCSE. CEI staff shall inform the EOR of this concurrence requirement. For proposals that are not design related, the initial point of contact shall be the SCSE who shall provide a response. This preliminary process will eliminate unnecessary submittals by the Contractor along with the corresponding effort. Questions regarding the acceptability of a Contractor Initiated changes shall be directed to the SCSE.

If the Department agrees to consider the proposal then the Contractor shall formally submit the proposal to the CEI staff with appropriate supporting documents. CEI staff shall inform the Contractor that the Department's agreement to consider the proposal in no way obligates the Department to approve the proposal or to reimburse the Contractor for any costs that the Contractor may incur to prepare the proposal. CEI staff shall transmit a copy of the proposal to the EOR for design related proposals for review and comment, and concurrently to the SCSE, along with the desired response time. The EOR will prepare a response to the proposal after consultation with the SCSE, making every effort to stay within the desired response time, and submit it, with a copy to the District Structures Design Engineer, to the CEI staff for disposition and approval by the District Construction Engineer (DCE) or a designee prior to notification of the Contractor. For proposals that are not design related, the formal proposal shall be transmitted to the SCSE who shall provide a recommendation response within the requested time. The DCE or a designee must approve the SCSE recommendation prior to notification of the Contractor. The SCSE and/or EOR may also request additional supporting documents via the CEI staff after reviewing the initial proposal and the final response may be delayed pending their receipt. On occasion, more than one cycle of submittal of additional supporting documents by the Contractor may be required before a final response can be issued. The State Structures Design Office will work through, and be coordinated by, the SCSE if their involvement is required.

10.10.7.2 Contractor Noncompliance with Contract Documents for Complex Superstructure Members and Complex Issues

Following are examples of how a Contractor can be out of compliance with contract documents for complex superstructure members or complex issues:

- Structural components (rebars, tendons, ducts, bearings, etc.) are out of tolerance
- Post-tensioning strand elongation that is above or below the required value
- The misalignment of beams in relation to their bearings
- Beams have sweep that exceeds specification tolerance
- Bolts are not installed and/or tightened according to specified procedures
- Grout pumping procedures are not in accordance with the approved grouting plan

Unless the DCE directs the Contractor to remove and replace the member or component in question, when the forgoing examples or other complex noncompliance issues arise, notify the SCSE and EOR as soon as the issue is identified in order to assist in developing the Department response. Any documents submitted by the Contractor for disposition of the issue shall be forwarded to the SCSE, and the EOR for review. The SCSE and EOR may also request additional supporting documents after reviewing the initial information and final recommendations may be delayed pending their receipt.

Recommendations may include requiring compliance regardless of impact; waiver of the noncompliance; or acceptance of the noncompliance with modifications that make it the equivalent of being in compliance. On-site meetings with the Contractor may be required to resolve the issue. The SCSE or EOR will make a recommendation, with a copy to the District Structures Design Engineer, to the CEI staff about how to resolve the issue in question. However, the final resolution shall be approved by the District Construction Engineer prior to notification of the Contractor.

Resolutions that result in a change to the As-Bid plans or drawings must be reflected in the final As-Built plans and drawings in accordance with **CPAM Section 5.12**.

10.10.7.3 Resolution of Damage or Defects of Complex Superstructure Members and Complex Issues

Bridge members may be damaged during handling or placement and some examples include denting, kinking or buckling of steel girders during placement; chipping, spalling or cracking of concrete beams during and after installation; or the dropping of concrete bridge segments during handling and erection. Some examples of typical bridge member defects include cracked concrete due to uncontrolled shrinkage; overstress or improper placement procedures; coating systems that do not adhere properly; secondary components such as bearings that are manufactured off site and that are unacceptable for incorporation into the

project; or machinery or electrical components that do not perform as intended. As soon as damage or a defect is discovered, the SCSE shall be notified in order to assist in developing proper disposition by the Department unless the DCE directs the Contractor to remove and replace the member, in which case notification of the SCSE is not required. If the damage or defect is design related then the initial point of contact shall be the EOR who shall consult with the SCSE for concurrence of the Department prior to making a final disposition recommendation on the issue. CEI staff shall inform the EOR of this concurrence requirement. Disposition may include acceptance as is, rejection of a member or component, or acceptance with corrective action and/or credit. The SCSE may also choose to attend on-site meetings with the Contractor or with experts involved with resolution of the issue and may choose to personally inspect the damaged or defective work in place. The SCSE or EOR will make a recommendation to the CEI staff about what action to take; however, final action shall be approved by the District Construction Engineer or a designee. Actions that result in a change to the As-Bid plans or drawings must be reflected in the final As-Built plans and drawings in accordance with **CPAM Section 5.12..**

10.10.7.4 Provision of On-Site CEI Training

At the option of project CEI staff, the SCSE is available to perform on-site training in complex bridge construction and inspection topics for inspectors and other staff. The following training topics are offered:

- High strength bolt installation and inspection
- Stressing and inspection of Post-tensioning tendons
- Filler injection and inspection of Post-tensioning tendons

This training shall be requested by the Construction Project Manager or Resident Engineer. A minimum of four week's notice is preferred.