



State of Florida Department of Transportation
Office of Construction

SUPPLEMENT

JANUARY 2013

CRITICAL STRUCTURES CONSTRUCTION ISSUES

SELF STUDY COURSE



St. George Island Bridge

1/18/2004 1:19pm

TABLE OF CONTENTS

INTRODUCTION	3
I. GUIDELISTS	3
II. CONSTRUCTION PROJECT ADMINISTRATION MANUAL (CPAM)	3
8.4 Shop and Erection Drawing Process	3
8.11.6 Request for Modification	4
10.2 Precast Prestressed Concrete Components	4
10.3.4.3 Implementation of Accepted Mass Concrete Temperature Control Plans	4
10.3.5 Crack Inspection	4
10.4.5.3 Critical Coating Inspection Issues	4
10.7 Post-Tensioned Bridges	5
10.9.5.3 Review and Evaluation	5
10.9.6 Testing and Record Keeping for Structural Steel	5
10.11 Electronic Management of Construction Documents Required by the District	5
III. CONSTRUCTION TRAINING AND QUALIFICATION MANUAL (CTQM), OTHER BRIDGE TRAINING COURSES AND MANUALS, AND EXPERIENCE REQUIREMENTS FOR COMPLEX BRIDGE PROJECTS	6
IV. SPECIFICATIONS	6
6-5.2 Source of Supply – Steel	6
346-3.2 Drilled Shaft Concrete	6
346-5 Sampling and Testing Methods	6
346-6.3 Delivery Certification	6
346-7.7 Sample Location	6
346-8 Plastic Concrete Sampling and Testing	6
346-9.2 Sampling Frequency	7
346-12 Pay Reduction for Plastic Properties	7
400-3 Depth of Footing	7
400-10.3 Bearing Pads	7
400-14.2.8 Finishing Bridge Sidewalks	8
400-16.4 Alternate Procedure	8
400-19 Cleaning and Coating Concrete Surfaces of Existing Structures	8
400-21 Disposition of Cracked Concrete	8
450-12 Non-complying Prestressed Products	8
450-14.2 Submittal of Repair Proposal	8
455-1.1 Protection of Existing Structures	8
455-5.11.7 Structures without Test Piles	9
455-5.14.2 Production Pile Length	9
455-5.14.4 Elevation	9
455-7.2 Manufacture	9
455-15.1.3 General Methods & Equipment	9
455-16.4 Cross-Hole Sonic Logging (CSL) Tubes	9
455-17.6.2 Access for Thermal Integrity Testing	9
455-29 Excavations	10
455-36.3 Excavation	10
560-9.7 Stripe Coating	10
460-7.2 Weathering Steel	10

461-5 Construction	13
--------------------------	----

V. DESIGN STANDARD INDEXES 13

Index Number: 6110, Wall Coping with Traffic Railing/Junction Slab	13
Index Numbers: 11871, Single Post Median Barrier Mounted Sign Support	13
Index Numbers: 20511 and 20512, Bearing Plates (Type 1 and 2) – Prestressed FIB	13

INTRODUCTION

This Supplement covers issues that have come to light since the last Supplement posted in January of 2012. As of January 1, 2013, the content of the 2012 Supplement has been incorporated into the Main Course (Critical Structures Construction Issues – Self Study Course) so that those taking the Main Course for the first time will not have to also take more than one Supplement. Review of this Supplement is mandatory for the following Department and Consultant Construction Engineering and Inspection (CEI) personnel involved in structures related construction: Resident Engineers, Construction Project Managers, Senior Project Engineers (SPE), Project Administrators (PA), Senior or Lead Inspectors and Inspectors. **Review of this Supplement must be completed by March 1, 2013 for existing personnel and within 60 days of the start of employment for new personnel.** CEI staff (in-house and consultant) should encourage Contractor employees involved with construction of structures to review this Supplement and the Main Course.

Individuals to Contact for further Information

For questions about taking this course supplement, contact your [District Construction Training Administrator](#). For technical questions about Supplement or Main Course content, contact the following Office of Construction Engineers: [State Construction Structures Engineer or Construction Structures Engineer](#).

Purpose of the Course Supplement

The purpose of this Supplement is to: ■ heighten awareness of widely misunderstood or overlooked specifications, procedures and other issues; ■ to present specifications and procedures that were implemented for the first time in recent years; and ■ to introduce new or upcoming specification and procedure changes that will significantly impact Contractor and CEI efforts in the future. The topics covered in this supplement will be flagged throughout this document with the colored squares above that correspond with their purpose. Supplement topics were selected by Office of Construction Engineers based on information gathered during annual field reviews of active projects in addition to feedback from Resident Engineer, Senior Project Engineers, Project Administrators and other field personnel related to changes to contract documents, noncompliance with contact documents, and damaged or defective structural elements. The structures issues presented are arranged by which of five topics they relate to as follows: **I.** Guidelists; **II.** Construction Project Administration Manual (CPAM); **III.** Construction Training and Qualification Manual (CTQM), Other Bridge Training Courses and Manuals, and Experience Requirements for Complex Bridge Projects; **IV.** Specifications; and **V.** Design Standards. [Blue colored text underlined in blue](#) that appears anywhere in this document is an internet hyperlink. Clicking on the blue text with the cursor will automatically open the internet page containing the information related to the blue text.

I. GUIDELISTS – There is no supplemental information for this topic this year.

II. CONSTRUCTION PROJECT ADMINISTRATION MANUAL (CPAM)

8.4 ■ [Shop and Erection Drawing Process:](#) Some of this section’s provisions have not been complied with consistently in recent years and need to be reemphasized.

CEIs must maintain at least a 9 item Shop Drawing Tracking Log and a schedule of planned shop drawing submittals must be provided by the Contractor to the CEI not more than 60 days after the start of work. The schedule is very important to EORs and other reviewers in order for them to be able to develop a meaningful manpower estimate for their shop drawing review effort.

At every weekly progress meeting, it is very important for the CEI to ask the Contractor to indicate which shop drawings have the highest review priority and the CEI shall report this to EOR reviewers in order that they will know which shop drawings require immediate attention.

8.11.6 ■ Contractor Initiated Submittals, Request for Modification: A Cost Savings Initiative Proposal (CSIP) is now required to be processed as a Request for Modification (RFM) as covered by CPAM 8.11. A CSIP is a Contractor initiated submittal that if approved, will initiate a change to the contract documents resulting in a reduction of project costs that are shared by the Department and the Contractor. CSIPs are covered by Specification 4-3.9.

10.2 ■ Precast Prestressed Concrete Components, Review and Evaluation: When preparing a response to a Contractor’s proposed disposition of defects, the PA must now receive concurrence from either the District Structures Design Engineer or the State Construction Structures Engineer, depending on the bridge category.

10.3.4.3 ■ Concrete Construction, Implementation of Accepted Mass Concrete Temperature Control Plans: A requirement that mass concrete monitoring records be transmitted to the District Concrete Engineer has been added to this Section. These records shall include all temperature readings that the Contractor is required to take a minimum of every 6 hours during curing. These records shall be transmitted to the District Concrete Engineer as soon as possible after collection. The District Concrete Engineer monitors the readings in order to determine if a Quality Assurance review is needed or if modification to the Mass Concrete Temperature Control Plan is necessary.

10.3.5 ■ Concrete Construction, Crack Inspection: The table below is intended to be used for guidance when estimating the depth of narrow nonstructural cracks. As judged by the Engineer, use of this table may eliminate the need to take concrete cores for determining crack depth.

Rule of Thumb (Rough Estimate) Relating Concrete Crack Width to Depth for Nonstructural Cracks

Average Crack Width (1/1000 inch or mils)	Approximate Crack Depth (inch)
4	1/2 inch
8	1
12	1-1/2
16	2
20 (See Note Below)	2-1/2

Note: The depth of cracks greater than 20 mils is very variable in comparison to crack width which is why the table stops at 20 mils.

10.4.5.3 ■ Steel Coating Issues, Critical Coating Inspection Issues: This section requires that critical painting inspection issues be given special attention by inspectors and their importance shall be emphasized in meetings and discussions with the Contractor prior to the start of coating work. Based on observations in recent years by State Materials Office staff of major coating defects, CEI coating inspectors shall be equipped with a mirror at all times in order to be able to fully view surfaces that cannot be seen with a direct line of sight. A new issue (Item Number 6) has been added as follows:

6) Stripe Coating: Specification 560-9.7 requires the stripe coating of welds, corners, crevices, sharp edges, bolts, nuts, rivets, and rough or pitted surfaces. Some Contractors have interpreted this Specification to mean that stripe coating is optional and is only required if, in their judgment, it is needed. This is not a correct

interpretation and at the Preconstruction Conference and again at the pre-operations meeting just prior to the first painting operation of the project, the CEI shall make it clear to the Contractor that stripe coating is a requirement and is not optional. Application of stripe coating is particularly important since failure to properly stripe coat surfaces is likely to result in premature corrosion of those surfaces and eventually to steel section loss. Specification 560-9.7 has been revised to make it absolutely clear that stripe coating is required and is not optional as well as what coats require stripe coating and how they are to be applied.

10.7 ■ Post-Tensioned Bridges: This section has been completely rewritten. What was previously a CPAM Section and separate Guidance document has been combined into a single document. Project Administrator and Inspector duties have been expanded and clarified for all portions of member casting, erection, stressing, grouting and post-grouting. Existing inspection forms have been revised and new forms for Segment Casting and Post-Grouting Inspection have been created. Instructional text that was contained within the main section has been replaced by the following hyperlinks to nationally recognized reference documents: [FHWA Post-Tensioning Tendon Installation & Grouting Manual](#) and the [ASBI Construction Practices Handbook for Concrete Segmental & Cable-Supported Bridges](#). **If you are, or in the near future will be, involved with Post-Tensioned bridges, you have not completed the review of this Supplement until you have read the latest version CPAM 10.7 in its entirety.**

10.9.5.3 ■ Structural Steel and Miscellaneous Metal Components, Review and Evaluation: This Section was revised to now require review of submittals by the Inspection Manager of the fabrication plant inspection service retained by the Department. The Inspection Manager's comments are critical because the consulting firm that provides the service is chosen for their qualifications in the fields of structural steel fabrication and metallurgical science. The Inspection Manager will know if a proposed correction to damage or defects is acceptable or not regarding preapproved fabrication practices or if it sets a precedent and; thereby, requires higher level consideration by the Department. Also, this Section requires all Contractor submittals for correction of steel defects or damage to be referred to as Requests for Correction (RFC) and are to be entitled as such on the cover page instead of their previous title of Non Conformance Report (NCR). However, the Nonconforming Structural Steel and Miscellaneous Metal Component Data Sheet is still required as an attachment to RFC submittals.

10.9.6 ■ Structural Steel and Miscellaneous Metal Components, Testing and Record Keeping for Structural Steel: CEIs are now officially required to witness Job Inspection Snug Tight Torque Tests, Rotational Capacity Tests, and Shear Connector Bend Tests and keep records of these tests on file. In addition, this section discusses a new requirement related to Job Inspection Snug Tight Torque Testing. The new requirement limits maximum bolt tension during the test to 15% above the specified minimum due to concerns about over tightening of bolts. **A detailed explanation for these issues is provided in CPAM 10.9.6.1 and you have not completed the review of this Supplement until you have read the latest version in its entirety.**

10.11 ■ General Structures Construction Issues, Electronic Management of Construction Documents Required by the District Structures Maintenance Office (DSMO): This topic was included in last year's Supplement; however, it continues to be misunderstood, ignored or misinterpreted by field staff and so it requires further emphasis since it is an area where compliance is weak. Construction documents that are electronically managed and that the DSMO must be able to easily access during the life of the structure are covered in 10.11.5. A table is provided entitled "**CDMS DOCUMENT PROFILE FIELDS FOR CONSTRUCTION DOCUMENTS REQUIRED BY THE DSMO**" that shows CEI staff where to electronically file construction documents (Construction Document Type, CDMS Group/ Type No., and Mandatory CDMS Document Subject/Description) so that in the future, DSMO staff will be able to find the records they need with minimal effort which has not been the case in the past. **Although the "Subject/Description" field of a CDMS document allows any alpha numeric character to be entered, the only characters that are to be entered as the first characters in the field are those that are required in the table entitled DOCUMENT PROFILE FIELDS FOR CONSTRUCTION DOCUMENTS REQUIRED BY THE DSMO. Once the Subject/Description that is required by the Table is entered in the first positions of the field, then any other characters may follow at the discretion of the coder.** By using the exact characters of the Table, Maintenance personnel can easily search a Subject/Description for a list of documents that have the precise information for which they are looking.

III. CONSTRUCTION TRAINING AND QUALIFICATION MANUAL (CTQM), OTHER BRIDGE TRAINING COURSES AND MANUALS, AND EXPERIENCE REQUIREMENTS FOR COMPLEX BRIDGE PROJECTS – There is no supplemental information for this topic this year.

IV. SPECIFICATIONS [\[Standard Specifications for Road and Bridge Construction 2010\]](#)

6-5.2 ■ Source of Supply-Steel or “Buy America Policy”: This article has not been well understood in recent years. Steel products used on projects must not only be produced in the United States but they must also be fabricated and assembled in the United States. The only exception is for products that do not exceed 0.1 % of the total contract amount or \$2,500.00 whichever is greater. Also, starting with January 2013 lettings, this specification will apply to all projects and not just to Federal-Aid projects as before (see the changes below). There will be occasional exceptions to the “All Projects” policy and these will be identified in the Contract Documents on a project by project basis. The following FHWA website provides excellent Buy America Policy guidance in a question and answer format: http://www.fhwa.dot.gov/construction/contracts/buyam_qa.cfm

6-5.2 (only changed text is shown and not the entire specification article) Source of Supply-Steel (Federal-Aid Contracts Only): *For Federal-aid Contracts, only use steel and iron produced in the United States, in accordance with the Buy America provisions of 23 CFR 635.410, as amended. Ensure that all manufacturing processes for this material occur in the United States.*

When FHWA allows Prior to the use of foreign steel on a project, furnish invoices to document the cost of such material, and obtain the Engineer’s written approval prior to incorporating the material into the project.

346-3.2 ■ Drilled Shaft Concrete: The slump loss testing provision of this specification has been revised significantly and so CEI staff should review this provision carefully prior to the start of drilled shaft operations.

346-5 ■ Sampling and Testing Methods: The requirement to take a composite concrete sample has been eliminated so instead of filling the wheel barrow up by taking concrete from the discharge stream at two different times, the entire sample can now be supplied all at one time.

346-6.3 ■ Delivery Certification: The definition of “Transit Time” on the delivery ticket has been changed to the time of complete discharge from the concrete truck. So instead of this time being when all concrete in the load is in its final position in the forms as before, it is now the time when all concrete has been discharged from the truck. However, the Engineer must approve any placement of concrete in its final position in the forms that exceeds the Transit Time by greater than 15 minutes as covered in 346-7.2.2. So, in other words, if the Contractor expects to take more than 15 minutes to transport the concrete from the back of the truck to the point of final placement, the Engineer (District Materials Engineer) must approve a time extension.

346-7.7 ■ Sample Location: This provision has been changed as follows (new text is in Italics):

When the concrete is discharged directly from the mixer into the bucket, ~~within 25% of the total allowable transit time before discharge of~~ *and the bucket is discharged within 20 minutes*, samples may be obtained from the discharge of the mixer.

Where a concrete pump is used to deposit concrete directly into a drilled shaft which is a wet excavation without the use of a tremie, or other applications as approved by the Engineer, ensure the discharge end of the pump line remains immersed in the concrete at all times after starting concrete placement.

346-8 ■ Plastic Concrete Sampling and Testing: This provision has been changed as follows (new text in Italics):

~~Do not proceed with the placement operation until QC tests confirm that the delivered concrete complies with the plastic properties specified. When a truck designated for QC testing arrives at the discharge site, a subsequent~~

truck may also discharge once a representative sample has been collected from the QC truck and while awaiting the results of QC testing. When a truck designated for QC testing arrives at the site of discharge, subsequent trucks may not discharge until QC testing results are known. Reject non-complying loads at the jobsite. Ensure that corrections are made on subsequent loads. Immediately cease concrete discharge of the subsequent truck if the QC truck has failing tests and perform a slump test of that truck. Immediately cease discharge and reject the remainder of the subsequent truck if its slump test fails and reject the remaining concrete of loads that fail plastic properties tests as soon as the test results are known. Perform slump tests on all trucks that arrive at the site prior to the first corrected truck. When more than one truck is discharging into a pump simultaneously, discharge all trucks completely prior to discharging a truck designated for QC testing into the pump and discharge a sufficient quantity of concrete from the end of the pump hose to obtain a representative sample of concrete from only the QC truck.

346-9.2 ■ Sampling Frequency: The minimum sampling frequency for roadway barrier wall has been reduced as follows: For any class of concrete used for roadway barrier wall, the lot size is now defined as 100 cubic yards, or one day's production, whichever is less.

346-12 ■ Pay Reduction for Plastic Properties: This provision has been changed as follows and now covers pay reduction for concrete placed in precast plants:

~~If concrete is placed even when the result of plastic properties testing requires its rejection, the payment for concrete represented by the plastic property tests will be reduced by twice the invoice price per cubic yard for all concrete in the load that is placed. If the Engineer authorizes placement of the concrete, there will be no pay reduction.~~

A rejected load in accordance with 346-6.4 is defined as the entire quantity of concrete contained within a single ready mix truck or other single delivery vehicle regardless of what percentage of the load was placed. If concrete fails a plastic properties test and is thereby a rejected load but is placed, payment for the concrete will be reduced. The pay reduction for cast-in-place concrete will be twice the invoice price per cubic yard of the quantity of concrete in the rejected load.

The pay reduction for placing a rejected load of concrete into a precast product will be applied to that percentage of the precast product that is composed of the concrete in the rejected load. The percentage will be converted to a reduction factor which is a numerical value greater than zero but not greater than one. The precast product payment reduction will be twice the Contractor's billed price from the Producer for the precast product multiplied by the reduction factor.

If the Engineer authorizes placement of the concrete, even though plastic properties require rejection, there will be no pay reduction based on plastic properties failures; however, any other pay reductions will apply.

400-3 ■ Depth of Footing: The text for this Section has been deleted because it is covered more appropriately in Specification 455 which 400-3 now references.

400-10.3 ■ Bearing Pads: This provision – see below - has been revised to ensure that elastomeric bearing pads are not overextended or damaged prior to final acceptance. Since the Contractor has no practical way of avoiding an occasional overextension, the effort for performing a correction if needed will be considered as extra work with corresponding reimbursement. CEI staff shall thoroughly inspect all elastomeric bearing pads for excess deformation and general condition prior to final acceptance and if possible well before, in order that the Contractor has ample time to perform corrections before final acceptance.

The Engineer will evaluate the degree of deformation and condition of bearing pads in the completed bridge on or before the final inspection required by Specification 5-10 or when requested by the Contractor. As directed by the Engineer, correct horizontal bearing pad deformations that at the time of inspection exceed 50% of the bearing pad thickness or that the Engineer predicts will exceed 50% of the bearing pad thickness during future high or low temperature periods. Payment for this correction effort will be considered extra work in accordance with 4-3.

400-14.2.8 ■ Finishing Bridge Sidewalks: This provision has been changed as follows to recognize that bridge and non-bridge sidewalks are to receive the same finish: *Finish Provide bridge sidewalks that are not finished in accordance with the applicable requirements of Section 522, a Class 4 finish.*

400-16.4 ■ Alternate Procedure (Curing Concrete): This provision has been revised to make it clear that even if cylinder break strengths allow loads to be applied to a bridge deck prior to 7 days after concrete placement that full compliance with curing provisions is still required.

400-19 ■ Cleaning and Coating Concrete Surfaces of Existing Structures: This provision – see below - has been expanded to more clearly explain how concrete surfaces of existing structures are to be cleaned and coated.

For the purposes of this article, an existing structure is one that was in service prior to the start of the project to which this specification applies. For existing structures, clean concrete surfaces that are designated in the Contract Documents as receiving Class 5 Applied Finish Coating by pressure washing prior to the application of coating. Use pressure washing equipment producing a minimum working pressure of 2,500 psi when measured at or near the nozzle. Do not damage or gouge uncoated concrete surfaces or previously coated concrete surfaces during cleaning operations. Remove all previously applied coating that is no longer adhering to the concrete or that is peeling, flaking or delaminating. Ensure that after the pressure wash cleaning and the removal of non-adherent coating, that the cleaned surfaces are free of efflorescence, grime, mold, mildew, oil or any other contaminants that might prevent proper adhesion of the new coating. After cleaning has been successfully completed, apply Class 5 Applied Finish Coating in accordance with 400-14.2.6 or as otherwise specified in the Plans.

400-21 ■ Disposition of Cracked Concrete: The following new footnote was added to the Abbreviations Table of this Section: *(7) Unless directed otherwise by the Engineer, repair cracks in bridge decks only after the grinding and grooving required by 400-145.2.5 is fully complete.*

450-12 ■ Non-complying Prestressed Products: A number of subarticles have been significantly revised most of which define the type or location of defects that require corrections that are addressed in the specifications and; therefore, do not require an engineering evaluation by a Specialty Engineer. CEI's must be aware of these changes in order to verify that Contractor's and Producer's are fully complying with these revised specifications. **You have not completed the review of this Supplement, until you have read the latest version of the following specifications in their entirety: 450-12.2.2, 450-12.5, 450-12.5.3.2, 450-12.5.3.4, and 450-12.5.3.5.**

450-14.2 ■ Submittal of Repair Proposal: This Subarticle has been significantly revised and CEI's must be aware of the changes in order to verify that Contractor's and Producer's are fully complying with this specification. **You have not completed the review of this Supplement, until you have read the latest version of 450-14.2 in its entirety.**

455-1.1 ■ Protection of Existing Structures: This specification has undergone significant revision that CEIs will need to be familiar with completely. **You have not completed the review of this Supplement, until you have read the latest version of 455-1.1 in its entirety.**

455-5.11 ■ Methods to Determine Pile Capacity: This specification has been revised to address the use of Embedded Data Collectors (EDC) as follows:

455-5.11.1 General: Dynamic load tests using *Embedded Data Collector (EDC) equipment and the UF Method of analysis, or an externally mounted instrument system and signal matching analyses* will be used to determine pile capacity for all structures or projects unless ~~shown~~ otherwise ~~shown~~ ion the ~~Plans~~Contract Documents. When necessary, the Engineer may require static load tests to confirm pile capacities. When the Contract Documents do not include items for static load tests, the Engineer will consider all required static load testing Unforeseeable Work. ~~When considered necessary by the Engineer, adjust the blow count criteria to match the resistance determined from static load tests. Notify the Engineer two work days prior to placement of piles within the template and at least one work day prior to driving piles. Do not drive piles without the presence of the Engineer.~~

If the internally mounted system fails to communicate properly with the receiving system, allow the Engineer sufficient time to mobilize back-up equipment for performing dynamic load testing.

455-5.11.7 ■ Structures without Test Piles: CEIs must be aware of the following **new** specification:

For projects without test piles, the Engineer will dynamically test the first pile(s) in each bent or pier at locations shown on the plans to determine the blow count criteria for the remaining piles. When locations are not shown on the plans, allow for dynamic load tests at 5% of the piles at each bent or pier. If the Engineer requires additional dynamic load tests for comparison purposes, the Contractor will be paid as for an additional dynamic load test as authorized by the Engineer in accordance with 455-11.5. When using externally mounted instruments, allow the Engineer one work day after driving the dynamic load tested piles for the Engineer to complete the signal matching analyses and determine the driving criteria for the subsequent piles in the bent or pier.

455-5.14.2 ■ Production Pile Length: This specification has been subdivided into two parts and revised as follows:

455-5.14.2.1 Structures With Test Piles: When test pile lengths are shown in the plans, the production pile lengths are based on information available during design and are approximate only. The Engineer will determine final pile lengths in the field which may vary significantly from the lengths or quantities shown in the plans.

455-5.14.2.2 Structures Without Test Piles: Authorized lengths are provided as Production Pile Order Lengths in the Pile Data Table in the Structure Plans. Use these lengths for furnishing the permanent piling for the structure.

455-5.14.4 ■ Elevation: This specification has been revised as follows:

Ensure that the final elevation of the pile head is no more than 1 1/2 inches above, or more than 4 inches below, the elevation shown in the plans, and in no case shall the pile be embedded less than 8 inches into the cap or footing. Do not embed the pile less than 6 inches below the elevation shown in the plans unless a minimum penetration requirement is shown.

455-7.2 ■ Manufacture: This specification has been revised as follows:

Fabricate piles in accordance with Section 450. When ~~Embedded Data Collectors~~ EDCs will be used for dynamic load testing, supply and install in square prestressed bridge foundation piles in accordance with Design Standards Index No 20602. Ensure the EDCs are installed by personnel approved by the manufacturer.

455-15.1.3 ■ General Methods & Equipment: This specification has been revised as follows:

Provide drilling tools with a diameter not less than 1 inch smaller than the shaft diameter required in the plans.

For drilled shafts installed to support mast arms, cantilever signs, overhead truss signs, high mast light poles or other miscellaneous structures, fill the excavation with premixed mineral slurry meeting the requirements of 455-15.8.1 or polymer slurry meeting the requirements of 455-15.8.2 before the drill advances to the bottom of the temporary casing. Do not attempt to excavate the shaft excavation using plain water or natural slurry.

455-16.4 ■ Cross-Hole Sonic Logging (CSL) Tubes: This specification has been revised as follows:

Access tubes must be NPS 1 1/2 Schedule 40 black iron or steel (not galvanized) pipe from the top of the cage to the tip of the shaft. Access tubes may be either NPS 1 1/2 Schedule 40 black iron or steel (not galvanized) or Schedule 80 PVC pipe above the top of the cage.

455-17.6.2 ■ Access for Thermal Integrity Testing: CEIs must be aware of the following **new** specification:

455-17.6.2 Access for Thermal Integrity Testing: Provide safe and secure access and assistance to the Engineer, when requested, for the purpose of evaluating drilled shaft integrity via internal temperature measurements using the Thermal Integrity Test method as described herein. The Thermal Integrity Test method is based on measuring the heat generation of hydrating cement. The analysis of measured temperature profiles requires knowledge of

the concrete mix used and soil profile for the purposes of determining heat generation and soil insulation parameters. For typical drilled shaft concrete mixes, thermal testing should be performed between one and two days after shaft concreting.

Provide access to the Engineer for testing the shafts within 4 hours of the peak temperature generation, which is expected to occur between 24 and 48 hrs after shaft concrete placement. Provide access to the Engineer for testing all drilled shafts in bridge bents or piers considered non-redundant in the plans. Based on the observations during drilled shaft construction, the Engineer may test one or all drilled shafts in bridge bents or piers considered redundant in the plans. For drilled shaft foundations supporting miscellaneous structures, only drilled shafts selected by the Engineer will be tested.

455-17.6.2.1 Evaluation of Thermal Integrity Testing: The Engineer will evaluate the observations during drilled shaft construction and the Thermal Integrity Test results within three working days of testing the shaft. If the shaft is selected for CSL testing, the evaluation will not be given to the Contractor before all CSL testing and analysis is complete and reported to the Engineer.

455-17.6.2.2 Coring and/or Repair of Drilled Shafts: If the Engineer determines a drilled shaft is unacceptable based on the Thermal Integrity Testing, core the shaft to allow further evaluation and repair, or replace the shaft in accordance with 455-17.6.1.5.

If repairs are performed, test in accordance with 455-17.6.1.5 and when requested, assist the Engineer in retesting the shaft(s) in accordance with 455-17.6.2.

455-29 ■ Excavations: CEIs must be aware of the following new specification:

If the excavation must be carried deeper than shown in the plans to obtain a satisfactory foundation, the Engineer will revise the plans in accordance with the following:

a. When the change in bottom elevation of the footing is 12 inches or less, the Engineer will keep the top of the footing at the elevation shown in the original plans and will increase the thickness to obtain a satisfactory foundation.

b. When the change in elevation of the bottom of footing exceeds 12 inches, the Engineer will revise the plans and lower the footing, thereby increasing the height of stem, to obtain a satisfactory foundation. Generally, the Engineer will also increase the thickness and width of footing over that shown in the original plans.

455-36.3 ■ Excavation: This specification has been revised as follows:

If the elevation of a footing as shown in the plans is changed to a higher or lower elevation, the Engineer will not consider such change as a material change to the original Contract Documents, a waiver of any condition of the Contract, or an invalidation of any of the provisions of the Contract.

560-9.7 ■ Stripe Coating: This specification was revised to make it clearer that stripe coating is not optional and must be applied. The specification is as follows: *Apply stripe coats to achieve complete coverage and proper thickness on welds, corners, crevices, sharp edges, bolts, nuts, rivets, and rough or pitted surfaces.*

460-7.2 ■ Weathering Steel: The Department now requires all structural steel superstructures to be fabricated with weathering steel which does not require painting and which will reduce maintenance costs significantly over the life of the bridge. Some exceptions will be permitted but they must be approved by the Chief Engineer which will require rigorous justification by the District. The specification has been revised as shown below and generally has to do with protecting concrete surfaces from corrosion staining. Also shown below for information, are Structural Detailing Manual Drawings that show designers how to prevent drainage water from causing rust stains on concrete elements. CEIs should verify that these details have been provided and that they are effective. If they are not effective, the EOR shall provide revised details and these shall be implemented through a Supplemental Agreement.

460-7.2.2 Steel Preparations: *Prior to erection, perform the following as appropriate: Blast clean the exposed fascia of the exterior girders (both I and box) to meet SSPC-SP10 criteria; blast clean the remaining exposed surfaces of steel trapezoidal girders, not required to be prepared otherwise, to meet SSPC-SP6 criteria; for steel I-girders, if a non-uniform mill scale finish has developed, as determined by the Engineer, blast clean all remaining exposed surfaces, not required to be prepared otherwise, to an SSPC-SP6 criteria; coat the inside of box members including, but not limited to, all bracing members, cross frames and diaphragms in accordance with*

Section 560. Coat the exterior face of box girder end diaphragms and all interior surfaces of box girders extending beyond the end diaphragm with an inorganic zinc coating system in accordance with Section 560.

460-7.2.3 Concrete Substructure Preparations:

460-7.2.3.1 Substructure Areas Not Receiving Class 5 Finish: Prior to erection of the girders, cover all exposed substructure concrete surfaces to protect them against staining from the weathering steel components. Leave the covering in place until after placement of the concrete deck. As directed by the Engineer, clean all visible stains on concrete in areas not receiving a Class 5 Finish by sandblasting and follow-on cleaning using a stain remover or commercial cleaner after completion of the structure in accordance with Section 400.

460-7.2.3.2 Substructure Areas Receiving a Class 5 Finish: If the Class 5 Finish is to be applied prior to the placement of the concrete deck, cover all finish concrete surfaces after application and curing of the Class 5 Finish to protect them from staining from the weathering steel components. Leave the covering in place until after placement of the concrete deck. Upon removal of the covering, reapply the Class 5 Finish to cover any stains which may be present. If the Class 5 Finish is to be applied after placement of the concrete deck, no substructure covering will be required.

Figure 16.12-2 Weathering Steel I-Girder Details (2 of 2)

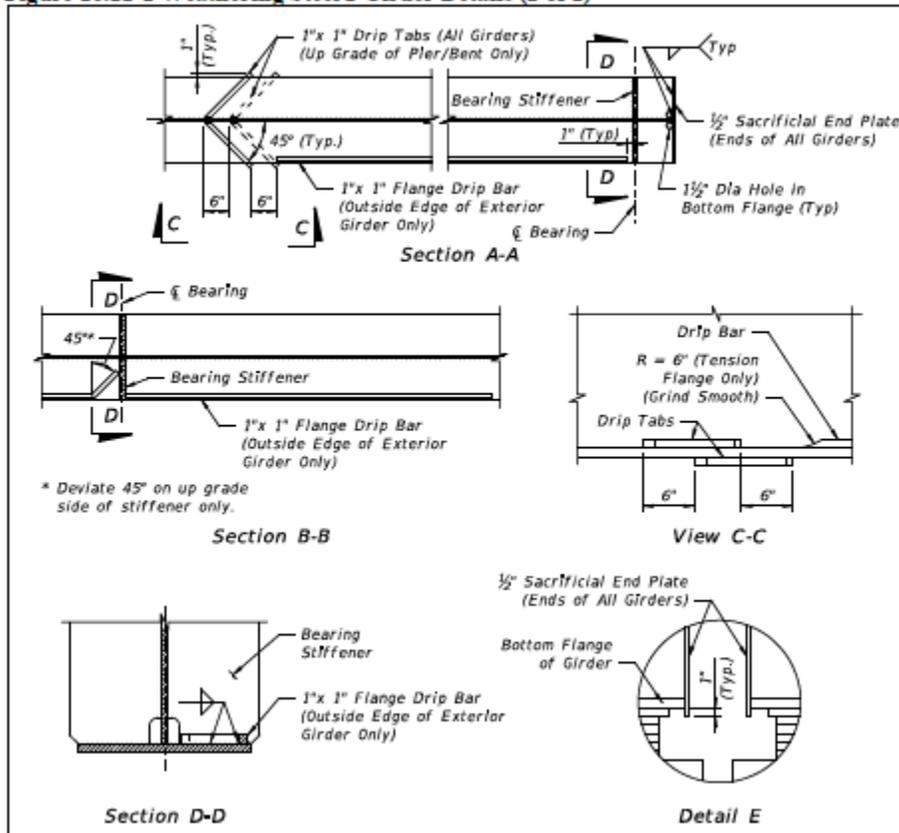


Figure 16.12-1 Weathering Steel I-Girder Details (1 of 2)

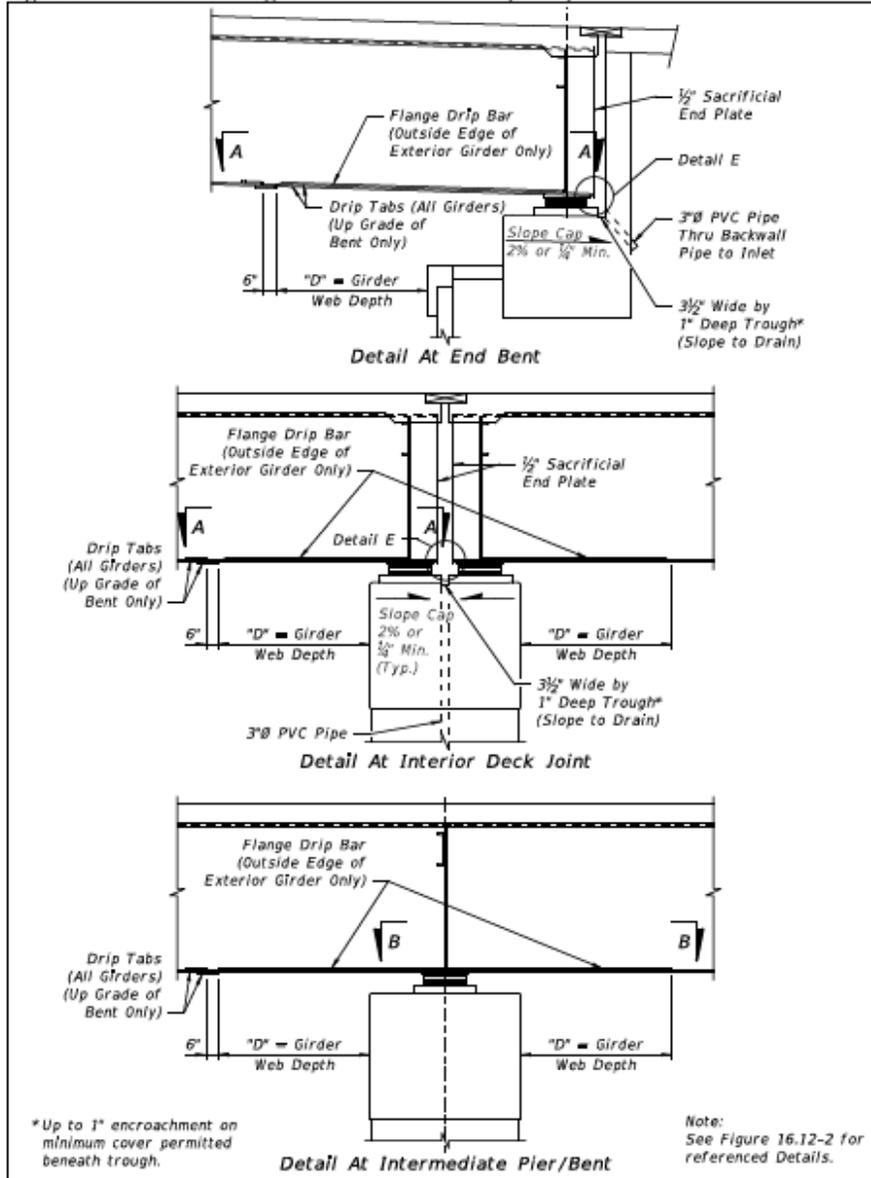
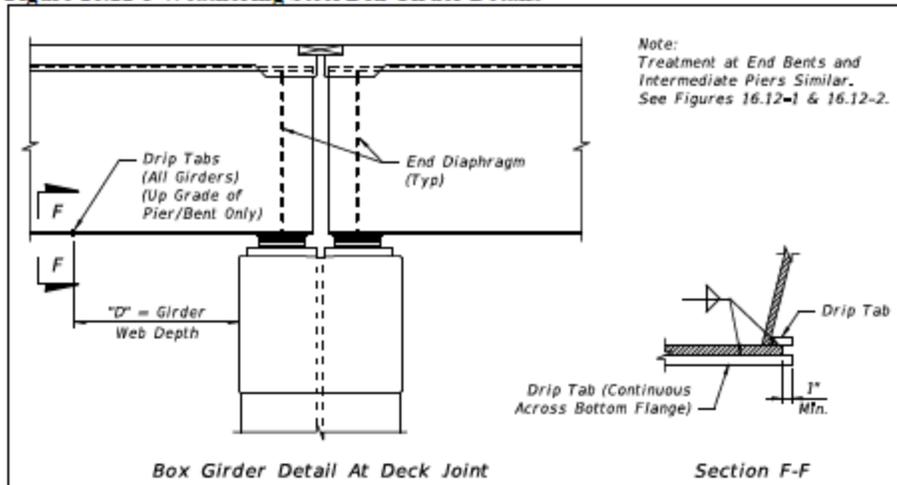


Figure 16.12-3 Weathering Steel Box Girder Details



461-5 ■ Construction (Multirotational Bearings): According to CEI's and Department Bridge Maintenance Engineers, the qualifications and experience of the Manufacturer's Representative that is required by this specification has been seriously lacking from time to time with significant consequences. More specific experience and knowledge requirements will be specified for the Manufacturer's Representative in a soon to be revised version as well as the requirement for a written certification of the Representative's qualifications to be submitted to the Engineer.

V. DESIGN STANDARD INDEXES

Index Numbers ■ 6110, Wall Coping with Traffic Railing/Junction Slab:

The Department recently met with members of the construction industry that manufacture and erect Mechanically Stabilized Earth (MSE) walls to listen to their concerns regarding the current design standards which result in the top panels of the wall having to be cast to a custom height most of the time. This increases fabrication costs as well as adding additional costs associated with the tracking for correct installation on the project site. As a result of the meeting with industry, the Department has made revisions to Standard [Index 6110](#) to address their concerns and these revisions went into effect with July 2012 lettings.

Index Numbers ■ 11871, Single Post Median Barrier Mounted Sign Support:

As a follow-up to Roadway Design Bulletin 12-05 and Structures Design Bulletin 12-03, titled "Median Traffic Railing Mounted Signs", the Department has developed new Design Standard [Index 11871](#) for single post median barrier mounted signs supports. The new Standard Index addresses installing permanent and temporary sign support on both permanent and temporary barriers and traffic railings.

Index Numbers ■ 20511 & 20512, Bearing Plates (Type 1 & 2) – Prestressed Florida-I Beams: These new Standard Indexes, [20511](#) and [20512](#), were implemented in the last year and cover details of bearing plates for Florida I Beams (FIB).