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M E M O R A N D U M

DATE: November 25, 2020

TO: Specification Review Distribution List

FROM: Daniel Strickland, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **0050104DB Scope of Work.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

The changes are proposed by Scott Arnold from the State Construction Office to clarify shop drawing submittal and review requirements.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or online at http://fdotewp1.dot.state.fl.us/programmanagement/development/industryreview.aspx . Comments received after **December 28, 2020,** may not be considered. Your input is encouraged.

DS/vc

Attachment

CONTROL OF THE WORK
(REV 11-19-20)

SUBARTICLE 5-1.4 is deleted and the following is substituted:

5-1.4 Shop Drawings:

5-1.4.1. Definitions: In addition to the definitions below, also refer to Section 1, Definitions and Terms.

1~~1~~. Bracing: Temporary structural member(s) placed between beams, girders, piles, precast columns, etc. to provide stability during construction activities.

2~~4~~. Construction Affecting Public Safety: Construction that may jeopardize public safety such as structures and construction operations spanning over or adjacent to functioning vehicular roadways, pedestrian walkways, railroads, navigable waterways, and walls supporting fill sections or excavations immediately adjacent to function roadways ~~demolition of a continuous span structure while traffic is under any span, pedestrian walkways, railroads, navigation channels of navigable waterways and walls or other structure foundations located in embankments immediately adjacent to functioning roadways.~~ Construction Affecting Public Safety may also apply to the demolition of a bridge with continuous beams or girders if traffic is being placed under one of the spans within the unit. It does not apply to those areas of the site ~~under the Contractor's control and~~ outside the limits of normal public access. Adjacent as used above applies to any project or property where normal construction operations could impact functioning vehicular roadways, pedestrian walkways, railroads, or navigable waterways

~~12~~3. Contractor Originated Designs: Items which the Contract Documents require the Contractor to design, detail and incorporate into the permanent works.

4. Detailer: The steel detailer that prepares the steel shop drawings for fabrication, geometry and fit-up for all steel members in accordance with the Plans.

5~~7~~. Falsework: Any temporary construction work used to support the permanent structure until it becomes self-supporting. Falsework includes steel or timber beams, girders, columns, bracing piles and foundations, and any proprietary equipment including modular shoring frames, post shores, and adjustable horizontal shoring.

~~8~~6. Formwork: Any structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Formwork may be comprised~~s~~ of common materials such as wood or metal sheets, battens, soldiers and walers, ties, proprietary forming systems such as stay-in-place metal forms, and proprietary supporting bolts, hangers and brackets. Formwork may be either permanent formwork requiring a shop drawing submittal such as stay-in-place metal or concrete forms~~,~~ or may be temporary formwork which requires certification by the Specialty Engineer for Construction Affecting Public Safety and for Major and Unusual Structures.

7. Construction IPR of Temporary Works Affecting Public Safety: Construction Independent Peer Reviews (IPRs) are required to validate the design of all Temporary Works Affecting Public Safety and bridge demolition plans affecting public safety. Except as defined below, the Construction IPR may be performed by a Specialty Engineer not responsible for the initial work. In no case shall the Construction IPR Reviewer and the Specialty Engineer responsible for the initial work be employed by the same Firm. The Construction IPR is intended to be a comprehensive, thorough independent verification of the original work. The Construction IPR is not simply a check of the Specialty Engineer's plans and

calculations; it is an independent verification of the design using different programs and independent processes than what was used by the Specialty Engineer responsible for the initial work. The Engineer of Record is permitted to perform the Construction IPR provided that the above conditions are met. All Shop Drawings requiring an IPR shall be submitted to the Department with a Signed and Sealed Construction IPR Certification Letter stating "…that the design of the temporary works has been reviewed and is in full compliance with all Contract Documents and appropriate design codes." The Construction IPR letter must also state which components (e.g. temporary works, etc.) were reviewed.

For temporary works meeting the requirements herein supporting the construction of Major and Unusual Structures defined in 5-1.4.8.a, 5-1.4.8.f and 5-1.4.8.g, the Construction IPR shall be performed by a qualified engineer per Rule 14-75 consistent with the relevant bridge type. Also, the certification shall be expanded to include a statement that "a verification of the temporary works includes a verification of all loads, reactions and displacements accounting for the interaction with the structure being supported and based on the design erection tolerances, force effects due to applicable superimposed deformations (uniform temperature, temperature gradients, elastic shortening, creep, shrinkage), wind and construction loads through all phases of construction."

85. Major and Unusual Structures: Bridges of complex ~~geometry and/or complex~~ design. Generally, this includes the following types of structures:

a. Bridges with an individual span longer than 300 feet.
b. Structurally continuous superstructures with spans over 150 feet.
c. Steel box and plate girder bridges.
d. Concrete or steel straddle piers and straddle pier caps.

ed. Steel truss bridges including pedestrian steel truss spans that utilize proprietary designs.

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fe. Concrete segmental ~~and longitudinally~~ post-tensioned ~~continuous~~girder bridges and post-tensioned substructures.

f. Cable stayed, extradosed or suspension bridges.
g. Arch bridges.
h. Tunnels.
i. All Movable bridges (~~specifically~~ including structural. electrical and mechanical components).

~~j~~k. Rehabilitation, widening, ~~or~~ lengthening or jacking of any of the above.

92. Permanent Works: All the permanent structures and parts thereof required of the completed Contract.

10. QA/QC Shop Drawing Check Prints: The Engineer of Record is responsible for conducting a review of all shop drawings regardless of whether the shop drawing is originated by the Engineer of Record or by others. QA/QC shop drawing check prints shall consist of highlighting items that the EOR is able to verify based on the EOR's plans and design information on each sheet reviewed. Each sheet shall be initialed by the reviewer. QA/QC Shop Drawing Check Prints shall be submitted to the Department along with the stamped Shop Drawing.

119. Scaffolding: An elevated work platform used to support workersmen, materials and equipment, but not intended to support the structure.

12. Shop Drawing: A drawing or set of drawings produced by the contractor, supplier, manufacturer, subcontractor, or fabricator for prefabricated components. Shop drawings also include all working drawings, erection plans, associated trade literature, material cut-sheets, calculations, schedules, erection manuals, geometry control manuals and other manuals and similar documents submitted by the Contractor to define some portion of the project work. The type of work includes both permanent and temporary works as appropriate to the project.~~All working, shop and erection drawings, associated trade literature, calculations, schedules, manuals and similar documents submitted by the Contractor to define some portion of the project work. The type of work includes both permanent and temporary works as appropriate to the project.~~

130. Shoring: A component of falsework such as horizontal, vertical or inclined support members. In this Section, this term is interchangeable with falsework.

146. Special Erection Equipment: Includes launching gantries, beam and winch equipment, form travelers, segment lifters, beam shifters,~~stability towers, strong-backs,~~ erection trusses, launching noses or similar items made purposely for construction of the structure. It does not apply to commonly available proprietary construction equipment such as cranes.

~~3~~15. Temporary Works: Any temporary construction work necessary for the construction of the permanent works. This includes but is not limited to bracing, falsework, formwork, scaffolding, shoring, stability towers, strong-backs, counterweights, temporary earthworks, sheeting, cofferdams, and special erection equipment.

5-1.4.2 Shop Drawing Submittal and Review Requirements: See table 5-1 below for Shop Drawing submittal and review requirements.

Table 5-1
Submittal and Review Requirements

Shop Drawing for:	Originated by Specialty Engineer Not Signed and Sealed	Originated by Detailer Not Signed and Sealed	Originated by Specialty Engineer Signed and Sealed	Originated by Contractors EOR Signed and Sealed	Requires Review, QA/QC Check prints and disposition stamp by Design EOR	Requires Construction IPR and signed and sealed Certification Letter
Steel Fabrication Drawings		Originator			Reviewer	
Steel Erection Plan			Originator		Reviewer	
Geometry Control Manual				Originator	Reviewer	

Table 5-1
Submittal and Review Requirements

Shop Drawing for:	Originated by Specialty Engineer Not Signed and Sealed	Originated by Detailer Not Signed and Sealed	Originated by Specialty Engineer Signed and Sealed	Originated by Contractors EOR Signed and Sealed	Requires Review, QA/QC Check prints and disposition stamp by Design EOR	Requires Construction IPR and signed and sealed Certification Letter
Segmental Erection Manual				Originator	Reviewer	Reviewer[5]
Segmental Shop Drawings	Originator				Reviewer	
Post-tensioning Mock-up Plan			Originator		Reviewer	
Post-tensioning Systems[1]			Originator		Reviewer	
Pretensioned Prestressed Concrete Products Containing FRP Bars or Strands Excluding Standard Piles and Sheet Piles			Originator		Reviewer	
Temporary Works Affecting Public Safety[2]			Originator		Reviewer	Reviewer[6]

Table 5-1
Submittal and Review Requirements

Shop Drawing for:	Originated by Specialty Engineer Not Signed and Sealed	Originated by Detailer Not Signed and Sealed	Originated by Specialty Engineer Signed and Sealed	Originated by Contractors EOR Signed and Sealed	Requires Review, QA/QC Check prints and disposition stamp by Design EOR	Requires Construction IPR and signed and sealed Certification Letter
Demolition Plans of Bridges with Continuous Beams or Girders Where One Span Within the Unit is Over Traffic			Originator			Reviewer[7]
Prefabricated Bridge Elements and System Connection Mock-Up Plans			Originator		Reviewer	
Bridge Formwork Including SIP Forms			Originator		Reviewer	
Construction Equipment Placed on Existing Bridges				Originator	Reviewer	

Table 5-1 Submittal and Review Requirements						
Shop Drawing for:	Originated by Specialty Engineer Not Signed and Sealed	Originated by Detailer Not Signed and Sealed	Originated by Specialty Engineer Signed and Sealed	Originated by Contractors EOR Signed and Sealed	Requires Review, QA/QC Check prints and disposition stamp by Design EOR	Requires Construction IPR and signed and sealed Certification Letter
Bridge components not fully detailed in the Plans, i.e. post-tensioning details, handrails, temporary operating systems for movable bridges etc.				Originator	Reviewer	
Retaining Wall Systems			Originator		Reviewer	
Precast Box Culverts			Originator		Reviewer	
Non-standard structures and components for drainage, lighting, signalization and signing			Originator		Reviewer	
Building structures			Originator [3]		Reviewer [4]	

Table 5-1
Submittal and Review Requirements

Shop Drawing for:	Originated by Specialty Engineer Not Signed and Sealed	Originated by Detailer Not Signed and Sealed	Originated by Specialty Engineer Signed and Sealed	Originated by Contractors EOR Signed and Sealed	Requires Review, QA/QC Check prints and disposition stamp by Design EOR	Requires Construction IPR and signed and sealed Certification Letter
Non-standard crash cushions and other nonstructural items			Originator		Reviewer	
Design and structural details furnished by the Contractor in compliance with the Contract				Originator	Reviewer	
Material or Product Cut-Sheets	Originator				Reviewer	

Table 5-1
Submittal and Review Requirements

Shop Drawing for:	Originated by Specialty Engineer Not Signed and Sealed	Originated by Detailer Not Signed and Sealed	Originated by Specialty Engineer Signed and Sealed	Originated by Contractors EOR Signed and Sealed	Requires Review, QA/QC Check prints and disposition stamp by Design EOR	Requires Construction IPR and signed and sealed Certification Letter

1 Includes approved post-tensioning systems and project specific integration details of the approved system.

2 Does not include formwork complying with Standard Plans, Index 102-600 (concrete placement is not permitted directly over traffic). Also, does not include critical temporary walls that are fully detailed in the plans unless redesigned by the Contractor. Does not include specialized equipment if traffic is removed from under equipment while equipment is being loaded, launched, and while loads are being transported by equipment.

3 In lieu of a Specialty Engineer the originator may be a licensed Architect.

4 In lieu of the Design Engineer of Record the reviewer may be the Design Architect of Record.

5. Submit an Independent Peer Review Certification Letter for portions of the Erection Manual that include temporary works affecting public safety. Specifically reference pages in the Erection Manual that are included in the Certification provided. The certification letter shall state: "…that the design of the temporary works has been reviewed and is in full compliance with all Contract Documents and appropriate design codes." The certification letter shall also clearly state what components (e.g. temporary works, etc. were reviewed).

6. The certification letter for the Construction IPR shall state: "…that the design of the temporary works has been reviewed and is in full compliance with all Contract Documents and appropriate design codes." The certification letter shall also clearly state what components (e.g. temporary works, etc. were reviewed).

7. The certification letter for the Construction IPR shall state: "…that the demolition plan has been reviewed and is in full compliance with the Contract and acceptable design codes and specifications."

~~**5-1.4.2 Work Items Requiring Shop Drawings:** In general, the Department requires shop drawings for items of work not fully detailed in the Plans which require additional drawings and coordination prior to constructing the item, including but not limited to:~~

~~1. Bridge components not fully detailed in the Plans, i.e. segments, steel girder details, post-tensioning details, handrails, etc.~~

~~2. Retaining wall systems~~

~~3. Precast Box Culverts~~

~~4. Non-standard structures and components for drainage, lighting, signalization and signing~~

~~5. Building structures~~

~~6. Non-standard crash cushions and other nonstructural items~~

~~7. Design and structural details furnished by the Contractor in compliance with the Contract~~

~~8. Temporary Works affecting public safety~~

~~Additional clarification for certain types of bridge structures is provided in 5-1.4.7. Other provisions of the Contract Documents may waive the requirement for submittals for certain items; i.e., items constructed from standard drawings or those complying with~~

~~alternate details for prestressed members under Section 450. Review the Contract Documents to determine the submittals required.~~

5-1.4.3 Schedule of Submittals: Prepare and submit a schedule of submittals that identifies the work for which shop drawings apply. For each planned submittal, define the type, and approximate number of drawings or other documents that are included and the planned submittal date, considering the processing requirements herein. Submit the schedule of submittals to the Department's Shop Drawing Review Office and the Engineer of Record within 60 days of the start of the Contract~~construction operations~~, and prior to the submission of any shop drawings.

Coordinate subsequent submittals with construction schedules to allow sufficient time for review and re-submittal, and approval prior to beginning fabrication, ~~-~~as necessary.

5-1.4.4 Style, Numbering, and Material of Submittals:

5-1.4.4.1 Drawings: Submit all shop drawings that are necessary to complete the structure in compliance with the design shown on the Plans. Prepare all shop drawings using the same units of measure as those in the Contract Plans. ~~English Units.~~ Consecutively number each sheet in the submittal series, and indicate the total number in the series (i.e., 1 of 12, 2 of 12, . . ., 12 of 12). Include on each sheet the following items as a minimum requirement: the complete Financial Project Identification Number, Bridge Number(s), drawing title and number, a title block showing the names of the fabricator or producer and the Contractor for which the work is being done, the initials of the person(s) responsible for the drawing, the date on which the drawing was prepared, the location of the item(s) within the project, the Contractor's approval stamp with date and initials, and, when applicable, the ~~signature and embossed seal of the~~ documents shall be signed and sealed by the Specialty Engineer or Contractor's Engineer of Record. A re-submittal will be requested when any of the required information is not included.

Shop drawings shall be submitted in Portable Document Format (PDF) files, formatted ~~in~~ on sheets 11~~-inch~~ by 17 inches~~ sheets~~.

5-1.4.4.2 Other Documents: Submit PDF files of other documents (such as trade literature, catalogue information, calculations, work plans including methods, phasing, procedures, sequences and manuals formatted on sheets)~~. Provide sheets~~ no larger than 11 by 17 inches. Clearly label and number each sheet in the submittal to indicate the total number of sheets in the series (i.e., 1 of 12, 2 of 12, . . . 12 of 12).

Prepare all documents using ~~English units~~ the same units of measure as the Contract Plans and include a Table of Contents cover sheet. List on the cover sheet the total number of pages and appendices, and include the complete Financial Project Identification Number, a title referencing the submittal item(s), the name of the firm and person(s) responsible for the preparation of the document, the Contractor's approval stamp with date and initials, and, when applicable, ~~the signature and embossed seal of the~~ the documents shall be signed and sealed by the Specialty Engineer or Contractor's Engineer of Record.

Submit appropriately prepared and checked calculations and manuals that clearly outline the design criteria. Include on the internal sheets the complete Financial Project Identification Number and the initials of the person(s) responsible for preparing and checking the document.

Clearly label trade literature and catalogue information on the front cover with the title, Financial Project Identification Number, date and name of the firm and person(s) responsible for that document.

5-1.4.5 Submittal Paths:

5-1.4.5.1 General: Shop drawings are not required for prequalified items. At the preconstruction conference, the Department will notify the Contractor in writing of any changes in the submittal path and whether the Department's review stamp will signify an officially reviewed shop drawing.

Submit shop drawings to the Engineer. Shop drawings shall be in conformance with the Department's ~~Plans Preparation~~FDOT Design Manual. When submitted to the Engineer for review by the Department, the shop~~-~~ drawings must bear the stamp and signature of the Contractor, EOR, and signature and seal of the Specialty Engineer, as appropriate. Only forward ~~-~~shop drawings stamped "Approved" or "Approved as Noted" along with the QA/QC Shop Drawing Check Prints and Construction IPR certification letter (when applicable) to the Engineer for review by the Department. Shop drawings submitted without the stamps of the Contractor and the EOR or without the QA/QC Shop Drawing Check Prints or Construction IPR certification letter (when applicable) will be returned for re-submittal. In the case where the EOR generates the shop drawings for the project, another engineer with the EOR's firm, not involved in the production of the shop drawing, will review and stamp the drawings per the requirements stated herein. Shop drawings shall not be submitted, processed reviewed, or approved until the component plan set for the particular item is stamped "~~r~~Released for Construction". For work requiring other information (e.g., catalog data, procedure manuals, fabrication/welding procedures, and maintenance and operating procedures), submit the required number of copies to the Engineer. Submit material certifications and material tests to the Engineer.

5-1.4.5.2 Building Structures: Submit ~~working~~shop ~~, shop and erection~~ drawings~~,~~ and all correspondence related to building structures, such as Rest Area Pavilions, Office Buildings, and Maintenance Warehouses, to the Engineer for review by the Department. All shop drawings for building structures shall bear the stamp and signature of the Contractor, Design-Build Firm's Architect of Record, and Specialty Engineer, as appropriate. Only forward shop drawings stamped "Approved" or "Approved as Noted" to the Engineer for Review.

5-1.4.5.3 Contractor Originated Design: Submit shop drawings and applicable calculations to the Engineer of Record for review. The shop drawings and applicable calculations must be signed and sealed by the Specialty Engineer or the Contractor's Engineer of Record. Submit in accordance with the requirements of 5-1.4. 1 through 5-1.4. 3, as appropriate.

5-1.4.5.4~~3~~ Temporary Works: For Construction Affecting Public Safety, ~~the~~ submit to the Engineer of Record and the Construction IPR Reviewer ~~shall review all shop~~ shop drawings and the applicable calculations for the design of special erection equipment, bracing, falsework, scaffolding, etc. The shop drawings and the applicable calculations will be signed and sealed by the Specialty Engineer. Submit ~~the submittal and copies of the transmittal letters~~ in accordance with the requirements of 5-1.4.1~~5-1.4.5.1~~ through 5-1.4.3~~5-1.4.5.2~~, as appropriate. Provide Signed and Sealed Construction IPR Certification Letter with submittal.

5-1.4.5.5 Demolition Plans of Bridges with Continuous Beams or Girders When Traffic is Under Any of the Spans of the Unit During Demolition Activities: For demolition plans of bridges with continuous beams or girders when traffic is placed under

any of the spans of the unit during demolition activities, the Specialty Engineer shall prepare signed and sealed demolition plans and applicable calculations including a step-by-step sequence of demolition, etc. Clearly denote any traffic restrictions for all demolition steps. Submit in accordance with the requirements of 5-1.4. 1 through 5-1.4. 3, as appropriate

For bridge demolition meeting the requirements herein the demolition plan shall be Independent Peer Reviewed. The Construction IPR shall be performed by a qualified engineer per Rule 14-75 consistent with the bridge type being demolished. The demolition plan and calculations shall be submitted to the Department with a Signed and Sealed Construction IPR Certification Letter stating "…that the demolition plan has been reviewed and is in full compliance with the Contract and acceptable design codes and specifications."

5-1.4.5.~~4~~6 Falsework Founded on Shallow Foundations: When vertical displacement limits are provided in the Plans for falsework founded on shallow foundations such as spread footings and mats, the Engineer of Record shall review all shop drawings and applicable calculations of the falsework system including subsurface conditions and settlement estimates. The shop drawings and the applicable calculations ~~will~~ must be signed and sealed by the Specialty Engineer. Submit in accordance with the requirements of 5-1.4.1 ~~5-1.4.5.1~~ through 5-1.4.3~~5-1.4.5.2~~, as appropriate.

5-1.4.5.~~5~~7 Formwork and Scaffolding: The Contractor is solely responsible for the safe installation and use of all formwork and scaffolding. The Department does not require any formwork or scaffolding submittals unless such work would be classified as Construction Affecting Public Safety. For formwork, scaffolding, or other temporary works affecting public safety, develop the required designs in accordance with the AASHTO Guide Design Specifications for Bridge Temporary Works, the AASHTO Construction Handbook for Bridge Temporary Works, and Chapter 11 of the Structures Design Guidelines (SDG) using wind loads specified in the SDG.

5-1.4.5.8~~6~~ Beam and Girder Temporary Bracing: The Contractor is solely responsible for ensuring stability of beams, ~~and~~ girders and columns ~~during~~ all handling, storage, shipping and erection. Adequately brace columns. beams and girders to resist wind, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the products, considering actual beam geometry and support conditions during all stages of erection and deck construction. At a minimum, provide temporary bracing at each end of each beam or girder. Develop the required bracing designs in accordance with the AASHTO LRFD Bridge Design Specifications (LRFD) and Chapter 11 of the SDG using wind loads specified in the SDG. For information not included in the SDG or LRFD, refer to the AASHTO Guide Design Specifications for Bridge Temporary Works and the AASHTO Construction Handbook for Bridge Temporary Works.

For Construction Affecting Public Safety, when temporary bracing requirements are shown in the Plans, submit Plans and calculations signed and sealed by a Specialty Engineer for the design of temporary bracing members and connections based on the forces shown in the Plans. In addition, submit a written certification that construction loads do not exceed the assumed loads shown in the Plans.

For Construction Affecting Public Safety, when temporary bracing requirements are not shown in the Plans or an alternate temporary bracing system is proposed, submit Plans and calculations signed and sealed by a Specialty Engineer including the stability analysis and design of temporary bracing members and connections.

5-1.4.5.9~~7~~ Erection Plan, Geometry Control Manual and Erection Manual: Submit, for the Engineer's review, an Erection Plan that meets the specific requirements of Sections 450, 452 and 460 and this section. Submit in writing for the Engineer's review an Erection Manual and Geometry Control Manual that meets the specific requirements of Section 462 and this section. Submit an Independent Peer Review Certification Letter for portions of the Erection Manual that include temporary works affecting public safety. Specifically reference pages in the Erection Manual that are included in the Certification provided. For all Erection Plans and Erection Manuals ~~R~~refer to Standard Plans, Index 102-600 for construction activities not permitted over traffic. For construction operations not covered in Index 102-600 clearly denote what additional construction steps are not allowed over traffic.

5-1.4.5.10~~8~~ Other Miscellaneous Design and Structural Details Furnished by the Contractor in Compliance with the Contract: The Engineer of Record shall review all shop drawings and the applicable calculations for miscellaneous design and structural details as required by the contract. The shop drawings and the applicable calculations will be signed and sealed by the Specialty Engineer. Submit in accordance with the requirements of 5-1.4.1~~5-1.4.5.1~~ through 5-1.4.3~~5-1.4.5.2~~, as appropriate.

5-1.4.6 Processing of Shop Drawings:

5-1.4.6.1 Contractor Responsibility for Accuracy and Coordination of Shop Drawings: Coordinate, schedule, and control all submittals, with a regard for the required priority, including those of the various subcontractors, suppliers, and engineers, to provide for an orderly and balanced distribution of the work.

Coordinate, review, date, stamp, approve and sign all shop drawings prepared by the Contractor or agents (subcontractor, fabricator, supplier, etc.) prior to submitting them to the Engineer for review. Submittal of the drawings confirms verification of the work requirements, units of measurement, field measurements, construction criteria, sequence of assembly and erection, access and clearances, catalog numbers, and other similar data. Indicate on each series of drawings the specification section and sheet or drawing number of the Contract Plans to which the submission applies. Indicate on the shop drawings all deviations from the Contract drawings and itemize all deviations in the letter of transmittal. Likewise, whenever a submittal does not deviate from the Contract Plans, clearly state so in the submittal.

Schedule the submission of shop drawings to allow for a review period as described in the RFP. The review period commences upon the Engineer's receipt of the valid submittal or valid re-submittal and terminates upon the transmittal of the submittal back to the Contractor. A valid submittal includes all the minimum requirements outlined in 5-1.4.4.

Submit shop drawings to facilitate expeditious review. The Contractor is discouraged from transmitting voluminous submittals of shop drawings at one time. For submittals transmitted in this manner, allow for the additional review time that may result.

Only shop drawings distributed with the approval stamps are valid and all work that the Contractor performs in advance of approval will be at the Contractor's risk. Work affecting Public Safety may not be performed prior to approval of appropriate submittals and work may not proceed at the Contractor's risk.

5-1.4.6.2 Scope of Review by Engineer of Record: The Engineer of Record's review of the shop drawings is for conformity to the requirements of the Contract Documents and to the intent of the design. The Engineer of Record's review of shop drawings

which include means, methods, techniques, sequences, and construction procedures are limited to the effects on the permanent works. The Engineer of Record's review of submittals which include means, methods, techniques, sequences, and construction procedures does not include an in-depth check for the ability to perform the work in a safe or efficient manner.

5-1.4.6.3 Special Review by the Engineer of Shop Drawings ~~by the Engineer of Record~~ for Construction Affecting Public Safety: The Engineer may request copies of shop drawings related to Construction Affecting Public Safety for review and comment. When shop drawings are requested, do not proceed with construction of the permanent works until receiving the Engineer's written approval. ~~For Construction Affecting Public Safety, the Engineer of Record will perform an independent review of all relevant shop drawings and similar documents. Do not proceed with construction of the permanent works until receiving the Engineer of Record's written approval.~~

5-1.4.7 Other Requirements for Shop Drawings for Bridges:

5-1.4.7.1 Shop Drawings for Structural Steel and Miscellaneous Metals: Submit shop drawings for structural steel and miscellaneous metals. Shop drawings shall consist of ~~working,~~ shop~~,~~ and erection drawings, welding procedures, and other working ~~Plans~~plans, showing details, dimensions, sizes of material, and other information necessary for the complete fabrication and erection of the metal work.

5-1.4.7.2 Shop Drawings for Concrete Structures: Submit shop drawings for concrete components that are not cast-in-place and are not otherwise exempted from submittal requirements. Also, submit shop drawings for all details that are required for the effective ~~prosecution~~ execution of the concrete work and are not included in the Contract Documents such as: special erection equipment, masonry layout diagrams, and diagrams for bending reinforcing steel, in addition to any details required for concrete components for the permanent work.

5-1.4.7.3 Shop Drawings for Major and Unusual Structures: In addition to any other requirements, within 60 days from the ~~n~~Notice to P~~p~~roceed, submit information to the Engineer outlining the integration of the Major and Unusual Structure into the overall approach to the project. Where applicable to the project, include, but do not limit this information to:

1. The overall construction program for the duration of the Contract. Clearly show the Milestone dates. (For example, the need to open a structure by a certain time for traffic operations.)
2. The overall construction sequence. The order in which individual structures are to be built, the sequence in which individual spans of girders or cantilevers are erected, and the sequence in which spans are to be made continuous and the order that components are to be installed (such as mechanical and electrical devices in moveable bridges).
3. The general location of any physical obstacles to construction that might impose restraints or otherwise affect the construction, and an outline of how to deal with such obstacles while building the structure(s). (For example, obstacles might include road, rail and waterway clearances, temporary diversions, transmission lines, utilities, property, and the Contractor's own temporary works, such as haul roads, cofferdams, plant clearances and the like.)

4. The approximate location of any special lifting equipment in relation to the structure, including clearances required for the operation of the equipment. (For example, crane positions, operating radii and the like.)

5. The approximate location of any temporary falsework, and the conceptual outline of any special erection equipment. Provide the precise locations and details of attachments, fixing devices, loads, etc. in later detailed submittals.

6. An outline of the handling, transportation, and storage of fabricated components, such as girders or concrete segments. Provide the precise details in later detailed submittals.

7. Any other information pertinent to the proposed scheme or intended approach.

Clearly and concisely present the above information on as few drawings as possible in order to provide an overall, integrated summary of the intended approach to the project. The Department will use these drawings for information, review planning, and to assess the Contractor's approach in relation to the intent of the original design. Submittal to and receipt by the Engineer does not constitute any Department acceptance or approval of the proposals shown thereon. Include the details of such proposals on subsequent detailed shop drawing submittals. Submit timely revisions and re-submittals for all variations from these overall scheme proposals.

5-1.4.8 Modifications for Construction: Where the Engineer allows the Contractor to make modifications to the permanent works for the purposes of expediting the Contractor's chosen construction methods, the Contractor shall submit proposals to the Engineer of Record for review and approval prior to modifying the works. Submit proposals for minor modifications under the shop drawing process. Indicate on all drawings the deviations from the Contract Documents and itemize all deviations in the letter of transmittal. The Department will require additional submittals and/or submittal under a Cost Savings Initiative Proposal for major modifications.

Minor modifications are those items that, in the opinion of the Engineer, do not significantly affect the quantity of measured work, or the integrity or maintainability of the structure or its components. (For example, adjusting concrete dimensions, substituting steel plate sizes, changing reinforcing bar size and spacing, etc., all within the acceptable limits of the design.)

Major modifications are any modifications that, in the opinion of the Engineer, significantly affect the quantity of measured work, or the integrity or maintainability of the structure or its' components. (For example, substituting alternative beam sizes and spacings, changing material strength or type, and the like.). Submit signed and sealed revised sheets to the Engineer for any such revisions to the Contract Plans prior to submitting shop drawings.

The Engineer's decision on the delineation between a minor and a major modification and the disposition of a proposal is final.

5-1.4.9 Cost of Shop Drawings: Include the cost of ~~shop and working~~ shop drawings submittal in the Contract prices for the work requiring the ~~shop and working~~ shop drawings. The Department will not pay the Contractor additional compensation for such drawings.

5-1.5 Certifications:

5-1.5.1 Special Erection Equipment: Prior to its use, ensure that the Specialty Engineer personally inspects the special erection equipment and submits a written certification to the Engineer that the equipment has been fabricated in accordance with the submitted drawings and calculations. In addition, after assembly, ensure that the Specialty Engineer observes the equipment in use and submits a written certification to the Engineer that such equipment is being used as intended and in accordance with the submitted drawings and calculations. In each case, the Specialty Engineer must ~~will~~ sign and seal the letter of certification.

5-1.5.2 Falsework and Shoring Requiring Shop Drawings: After its erection or installation but prior to the application of any superimposed load, ensure that a Specialty Engineer or a designee inspects the falsework and certifies to the Engineer in writing that the falsework has been constructed in accordance with the materials and details shown on the submitted drawings and calculations. The letter of certification ~~will~~ must be signed and sealed by the Specialty Engineer. Where so directed in the shop drawings, ensure all welds are performed by welders qualified under AWS D1.5 for the type of weld being performed.

5-1.5.3 Temporary Formwork: For Construction Affecting Public Safety and for Major and Unusual Structures, prior to the placement of any concrete, ensure that a Specialty Engineer or a designee inspects the formwork and submits a written certification to the Engineer that the formwork has been constructed to safely withstand the superimposed loads to which it will be subjected. ~~Ensure that the Specialty Engineer signs and seals the letter of certification~~ The Specialty Engineer must sign and seal the letter of certification.

5-1.5.4 Erection: For Construction Affecting Public Safety, submit an erection plan signed and sealed ~~erection plan to the~~ by the Specialty Engineer to the Engineer at least four weeks prior to erection commencing. ~~in accordance with the submittal timeframes described in the RFP.~~ Include as part of this submittal signed and sealed calculations and details for any falsework, bracing or other connection(s) supporting the structural elements shown in the erection Plan. Unless otherwise specified in the Plans, erection Plans are not required for simple span precast prestressed concrete girder bridges with spans of 170 feet or less.

At least two weeks prior to beginning erection, conduct a Pre-erection meeting to review the details of the plan with the Specialty Engineer that signed and sealed the plan, and any Specialty Engineers that may inspect the work, and the Engineer.

After erection of the elements, but prior to opening of the facility below the structure, ensure that a Specialty Engineer or a designee has inspected the erected member. Ensure that the Specialty Engineer has submitted a written certification to the Engineer that the structure has been erected in accordance with the signed and sealed erection plan.

For structures without temporary supports but with temporary girder bracing systems, perform, as a minimum, weekly inspections of the bracing until all the diaphragms and cross frames are in place. For structures with temporary supports, perform daily inspections until the temporary supports are no longer needed as indicated in the erection plans. Submit written documentation of the inspections to the Engineer within 24 hours of the inspection

5-1.6 Corrections for Construction Errors: For work that the Contractor constructs incorrectly or does not meet the requirements of the Contract Documents, the Contractor has the prerogative to submit an acceptance proposal to the Engineer for review and disposition. The acceptance proposal shall describe the error or defect and either describe remedial action for its correction or propose a method for its acceptance. In either case, the acceptance proposal shall address structural integrity, aesthetics, maintainability, and the effect on Contract Time. The

Department will judge any such proposal for its effect on these criteria and also for its effect on Contract Administration.

When the Engineer judges that a proposal infringes on the structural integrity or maintainability of the structure, the Contractor's Engineer of Record will perform a technical assessment and submit it to the Engineer for approval. Do not take any corrective action without the Engineer's written approval.

Carry out all approved corrective construction measures at no expense to the Department.

Notwithstanding any disposition of the compensation aspects of the defective work, the Engineer's decision on the technical merits of a proposal is final.