SUPPLEMENTAL SPECIFICATION

January 1, 2021

APPROVED:
Division Administrator
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Date: 2020.10.22 13:15:48 -04'00'
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FEDERAL HIGHWAY ADMINISTRATION

Section 702 Falsework/Forming Systems

Delete and replace Subsection 702.4.1.2 Design of the Standard Specifications in its entirety and replace with the following:

702.4.1.2 Design

1 Design falsework/form systems to handle all vertical and horizontal loading that may be placed upon it and with sufficient redundancy to prevent failure of the system because of the failure of any individual element. Include the sum of all anticipated vertical dead and live loads and real and assumed horizontal loads. Include the weight of the concrete, reinforcing steel and other encased items, equipment, personnel, forms, and falsework. For the weight of concrete, do not use less than 150 pounds per cubic foot for normal concrete and not less than 120 pounds per cubic foot for lightweight concrete.

2 For live loads, use the actual weight of any equipment and personnel to be supported by falsework applied as concentrated loads at the points of contact plus a uniform load of not less than 20 pounds per square foot applied over the area supported, plus 75 pounds per linear foot applied at the outside edge of deck overhangs.

3 For horizontal loads, use actual horizontal loads due to equipment and personnel, construction sequence, or other causes, plus an assumed horizontal wind load of not less than 50 pounds per square foot of horizontal surface area or 2% of the total dead and live load, whichever is greater.

4 Erect falsework with sufficient camber and/or adjustment to compensate for deflection and settlement under the weight of concrete so that the completed structure or part thereof has the alignment and curvature shown in the Plans. When footing type foundations are used for falsework support, determine the bearing value of the soil and show the values assumed in the design on the Working Drawings. Consider the effects of differential settlement. Limit settlement and support of falsework to 1 inch or less.

5 When falsework is to be placed adjacent to public roads, consider the effects of vibrations from passing vehicles and include provisions for protection of the falsework from errant vehicles.

6 If falsework from one bridge is to be used on another bridge, determine new loading conditions and verify the adequacy of the falsework system. Incorporate into the design any adjustments or changes necessary.

7 When the project Plans require the use of cofferdams and/or shoring systems for construction of bridge substructures or other elements of work, the Contractor is required to retain the services of an engineer(s) licensed pursuant to the laws of South Carolina who has (have) a minimum of 3 years of experience in the design of cofferdams and/or shoring systems. The Contractor is responsible for all structural and geotechnical design of the cofferdam or shoring system. Design all cofferdams or shoring systems using LRFD methods and in accordance with the following documents:

A. AASHTO Guide Design Specifications for Bridge Temporary Works, latest version with all interims
B. AASHTO Construction Handbook for Bridge Temporary Works, latest version with all interims

C. AASHTO LRFD Bridge Construction Specifications, latest version with all interims
D. AASHTO LRFD Bridge Design Specifications, latest version with all interims
E. SCDOT Geotechnical Design Manual (GDM), latest version including all Geotechnical Design Bulletin (GDBs).

8 The load (γ) and resistance (φ) factors for temporary structures [service life (S_L) less than 5 years (S_L < 5 years)] contained in the SCDOT GDM shall be used in the design of the cofferdam or shoring system. Do not use Extreme Event I (EE I) in the design of cofferdams or temporary shoring systems, unless the cofferdam or permanent shoring system will be in use for 5 years or more. Prior to designing any cofferdam or permanent shoring system to be in service for 5 years or more, coordinate and discuss with the Regional Production Engineer, why the cofferdam or permanent shoring system must be in service 5 years or more.

9 Design all cofferdams or shoring systems to resist all dead and live loadings including earth pressures, hydrostatic pressures, traffic loads, point loads, line loads, and surcharge loads that the cofferdam or shoring system may experience during the life of the structure (include on working drawings).

10 The Contractor is solely responsible for the external and internal stability of all cofferdams or shoring systems. Use the soils information provided in the plans for these designs. If additional cofferdams or shoring systems are required by the Contractor's means and methods, the Contractor is solely responsible for obtaining the required geotechnical information. The Contractor's geotechnical exploration shall meet the requirements of the SCDOT GDM (latest version). All cofferdams or shoring systems are considered to be Earth Retaining Structures (ERSs).

11 Submit the results of the geotechnical investigation; all design calculations, including soil design parameters used; methods of construction; details of components that will not be removed; and detailed drawings for design cases to RCE.

12 When permanent embankments are to be constructed against the temporary shoring system, submit a method to prevent reflective cracking of the pavement structure at the top of the embankment that may occur at the interface between the two construction phases. This may be accomplished by constructing a load transfer platform beneath the pavement structure or approach slab that crosses over the two construction phases. Backfill any voids created by removal of the cofferdam or temporary shoring system.

13 Provide all submittals in accordance with **Section 725**. Only submittals that have the seal and signature of the Contractor's Design (Structural and/or Geotechnical) Engineer-of-Record, who is licensed pursuant to the Laws of South Carolina, are acceptable.