MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**COFFERDAM LEFT IN PLACE, SPECIAL**

BRG:TNB 1 of 2 APPR:RWS:JAB:02-25-21

**a. Description.** This work consists of designing, furnishing, installing, dewatering, maintaining, removing and/or cutting off sheet piling, as coordinated with the staged construction requirements for the project. Ensure the working drawings and design calculations are prepared and sealed by a Professional Engineer, licensed in the State of Michigan. Perform the work in accordance with section 704 of the Standard Specifications for Construction, the *2002* *AASHTO Standard Specifications for Highway Bridges 17th Edition* (“AASHTO” hereafter), the plans and this special provision.

**b. Materials.** Provide materials in accordance with subsections 704.02 and 707.02 of the Standard Specifications for Construction. Provide hardware and adhesives, for use in anchoring the sheet piling to existing concrete, suitable for the load requirements of the installation.

**c. Construction.** Design, prepare working drawings and installation plan, install, remove and/or cut off the cofferdams. Design the cofferdams and adjacent excavations to support live loads as well as to accommodate over excavation of unsuitable material as shown on the plans (if applicable). If the cofferdam is used for a culvert, ensure the sheet pile enclosure during the backfill operation is designed for a partial dewatered condition (differential head) where the water level within the enclosure is equal to at least 2 foot below the bottom of the proposed culvert. Design cantilever or braced steel sheet piling walls using the following software: SPW 911 by PileBuck International Inc.; SupportIT by GTSoft Ltd.; or CivilTech Software Shoring Suite. Use of other software will be reviewed by the Department and requires approval by the Engineer prior to use. Hand calculations and/or spreadsheet calculations will not be accepted for steel sheet piling design unless special conditions are present, which will require approval by the Engineer prior to use. Hand calculations and/or spreadsheet calculations (with example hand calculations) for design of anchors, deadman, bracing sections, weld details and connections are acceptable.

Assume a minimum live load surcharge of 360 pounds per square foot (psf) for design of cofferdams adjacent to traffic and/or construction equipment purposes. For cofferdams supporting structures or buildings, account for the loads from the structure or building on the sheet piling. The calculated and measured maximum deflection of the steel sheet piling must not exceed 2 inches. The calculated and measured maximum deflection of the cofferdam must not exceed 1 inch when the cofferdam is supporting structures or utilities. The calculated and measured maximum deflection of the cofferdam must not exceed 1/2 inch when the cofferdam is supporting buildings. Include supporting calculations for the cofferdams including: sheeting sections, sheeting tip elevations, bracing and anchor sections, connections, and weld details. The design must consider and provide supporting calculations for all stages of construction.

Ensure bottom stability (piping/heaving) and overall (global) stability is evaluated for all stages of construction. Ensure the minimum factor of safety for bottom stability is 2.0 and for overall stability is 1.3. Ensure bottom stability calculations are in accordance with the *Naval Facilities (NAVFAC) 7.01 Soil Mechanics engineering manual*.

Ensure that the design is prepared by the Contractor’s designer; and the designer is a Professional Engineer, licensed in the State of Michigan. Electronically submit the design and supporting calculations to the Engineer for review and approval not less than 14 calendar days prior to beginning of work. All submittals are to be submitted as a portable document format (PDF) file to the Engineer. Paper sets are prohibited. Obtain the Engineer’s approval of the cofferdam design prior to beginning installation. The Department will require 10 calendar days for each review cycle and revisions may be required following each review. No extension of time or additional compensation will be granted due to delays in preparing the final working drawings, calculations and material specifications or securing approval from the Department. An exception may be granted for an extension of time only in the case that the Department’s review of a submittal exceeded 10 calendar days and if it can be shown that such a delay impacts the final project completion date.

Install the cofferdams for this project in stages that match the staged construction of the project. The limits and sequence of cofferdam construction are shown conceptually on the plans; however, the Contractor’s design and installation plan will take precedence.

Cut off cofferdams, shown to be left in place, a minimum of 3 feet below proposed grade/road surface or as approved by the Engineer.

When no longer needed cut off cofferdams, shown to be left in place, during the staged construction as shown on the plans or as approved by the Engineer. Unless otherwise shown on the plans, ensure cofferdams are cut off to the following minimum depths as indicated below:

• 3 feet below pavement, shoulders, sidewalks, and paths,

• 2 feet below side slopes,

• 1 foot below footings,

• 3 inches below bottom of culvert,

• At the bottom of riprap or bottom of apron.

**d. Measurement and Payment.** The completed work, as described, will be measured as a lump sum and paid for at the contract price using the following pay item:

**Pay Item Pay Unit**

Cofferdam, Left in Place, Spec (Structure Identification) Lump Sum