MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**STEEL SHEET PILING, TEMPORARY, LEFT IN PLACE, SPECIAL**

BRG:AM 1 of 2 APPR:SCK:RWS:05-03-21

**a. Description.** This work consists of designing, furnishing, installing, maintaining, and cutting off the steel sheet piling and bracing, anchors, deadman, walers, related materials, and equipment required to maintain support of the sheeting as well as the adjacent embankment, road, structure, utility, building, etc, as applicable. Coordinate this work with the staged construction requirements at this site. Perform the work in accordance with section 704 of the Standard Specifications for Construction, the *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.

**c. Construction.** Design, prepare working drawings, install, and maintain the temporary steel sheet piling. Design cantilever or braced steel sheet piling walls interaction with the soil using the following software: SPW 911 by PileBuck International Inc.; SupportIT by GTSoft Ltd.; or CivilTech Software Shoring Suite. The 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.

Design the steel sheet piling, ground anchors, deadman, bracing sections, and adjacent excavations to support traffic. Assume a minimum live load surcharge of 360 psf for design of steel sheet piling adjacent to traffic and/or construction equipment. For sheet piling supporting structures or buildings, account for the loads from the structure 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 steel sheet piling must not exceed 1 inch when the steel sheet piling is supporting structures or utilities. The calculated and measured maximum deflection of the steel sheet piling must not exceed ½ inch when the steel sheet piling is supporting buildings. Include supporting calculations for the steel sheet piling including: sheeting, anchors, deadman, bracing sections, welded or bolted connection details, sheeting tip elevations, calculated deflection of sheeting sections, all connections and embedment depth. The design must consider and provide supporting calculations for all stages of construction.

If ground anchors are used, submit a load testing program for review by the Department with the design submittal. The Contractor’s designer must reference *FHWA Publication No. FHWA-IF-99-015 (Geotechnical Engineering Circular No. 4, Ground Anchors and Anchored System)* in the design and load testing program. Load test all ground anchors, regardless of anchor type. Prestress and lock off all ground anchors and deadman. Ground anchors and deadman that cannot be prestressed to the required load and locked off cannot be used. When helical anchors are used for ground anchors, the design load must not exceed 50 kips.

Ensure that the design is prepared by the Contractor’s designer; and the designer is a Professional Engineer, licensed in the State of Michigan (Designer). Ensure the design is checked by a second Professional Engineer licensed in the State of Michigan (Checker). The Designer and Checker must not be the same person. The calculations must have the initials of the Designer and Checker. 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 as a PDF file to the Engineer. Paper sets are prohibited. Obtain the Engineer’s approval of the steel sheet piling design prior to beginning installation. The Engineer 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 Engineer. An exception may be granted for an extension of time only in the case that the Engineer’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.

Alternate temporary retaining wall design options may be considered for this project by the Engineer provided that alternate designs are prepared and submitted in accordance with this special provision. All alternate temporary retaining wall design options must conform to *AASHTO* and *FHWA* specifications and/or guidelines.

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

When no longer needed cut off steel sheet piling, 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 steel sheet piling is 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 and paid for at the contract unit price using the following pay item:

**Pay Item** **Pay Unit**

Steel Sheet Piling, Temp, Left in Place, Spec Square Foot

**Steel Sheet Piling, Temp, Left in Place, Spec** quantities will be computed based on the area of required earth retention. The vertical dimension for computing areas will be the difference in ground elevation at the sheeting line or the planned foundation excavation limit at the sheeting line, whichever is less. Unless shown on the plans, the lateral limits will be determined by the design. When earth is retained on both sides of the same steel sheet piling during different construction stages, including any bracing and/or anchorage modifications, the quantity will be computed from the stage requiring the largest area of earth retention and not the sum of the area of required earth retention for each stage.

All horizontal measurements will be made along the sheet piling alignment without allowance for the structural shapes of the separate sections.