

SECTION 02160

EXCAVATION SUPPORT SYSTEMS

1. PART 1 GENERAL

1.1 WORK INCLUDES

- A. Sheeting, Shoring, and Bracing.
- B. Does not include Jacking or Receiving Pits. See Section 2178 – Steel Sheet Pile Boring and Jacking Pits/Cofferdams.

1.2 RELATED SECTIONS

- A. Section 02178 – Steel Sheet Pile Boring and Jacking Pits/Cofferdams.
- B. Section 02211 – Rough Grading.
- C. Section 02222 – Excavation.
- D. Section 02225 – Trenching.
- E. Section 02320 – Utilities Installed in a Boring, Jacking or Tunneling Operation.
- F. Section 03100 – Concrete Formwork.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable OSHA regulations.

1.4 REFERENCES

- A. ASTM A-328 - Standard Specifications for Sheet Piling.
- B. ASTM A-572 - Grades 50, High Strength.
- C. ASTM A-690 - High Strength, Corrosion Resistant.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Submit shop drawings and product data for all items to be installed and/or constructed within this Section.
- C. Submit manufacturer's instructions for all product data.
- D. Shop drawings shall include sheeting, shoring, and bracing design and calculations prepared and sealed by a registered professional engineer.
- E. Product shall include component sizes, dimensions, and finishes.

1.6 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Excavation Support Systems:

1. **Basis of Measurement:** Included in the unit bid price for junction chambers, drain crossings, control structures, storm sewer and other pay items being installed as stated in proposal.

2. Basis of Payment: Includes material, equipment and labor necessary to install temporary excavation support to construct proposed Project. This includes, but is not limited to sheet piling, cofferdams, trench boxes, tiebacks, and any other items to support trenching and excavations. All excavation support shall be designed and sealed by the Contractor's registered professional engineer and submitted to the Owner's Engineer for review. Design costs to be paid for by the Contractor.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. Timber and lumber for shoring and bracing shall be new, merchantable pine, Douglas Fir or spruce, unless otherwise shown or specified. Secondhand timber or lumber shall not be used where strength and/or appearance are important considerations.
- B. Steel for sheeting, shoring, and bracing shall be as per the referenced ASTM specifications.
- C. Temporary Sheeting: Select section modulus, embedment depth and bracing required to complete the work unless noted on the plans.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. The Contractor is responsible for the design and location of all sheeting, shoring, and bracing.
- B. Where required to properly support the surfaces of excavations and to protect the construction Work and workmen, sheeting, bracing and shoring shall be provided.
- C. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports at the expense of the Contractor, but neither the placing of such additional supports by the order of the Engineer nor the failure of the Engineer to order such additional supports placed shall release the Contractor from his responsibility for the sufficiency of such supports and the integrity of the Work.
- D. Damage to new or existing structures occurring through settlements due to failure or lack of sheeting or bracing shall be repaired by the Contractor at his own expense.
- E. Conflict of opinion as to whether the settlement is due to the Work of the Contractor or to any other cause will be determined by the Engineer.
- F. In general, the sheeting and bracing shall be removed, as the trench or excavation is refilled, in such a manner as to avoid the caving in of the Work.
- G. Fill voids left by the withdrawal of the sheeting by ramming, or otherwise as directed.

- H. When sheeting and bracing is removed, the Contractor shall assume full responsibility for injury to structures or to other property or persons arising from failure to leave in place such sheeting or bracing.
- I. For the purpose of preventing injury to the structures, or to other property or to persons, the Contractor shall leave in place any sheeting or bracing shown on the plans or ordered in writing by the Engineer.
- J. Cut off sheeting left in place at the elevation ordered but not less than 24" below the final ground surface.
- K. Bracing remaining in place shall be driven up tight.
- L. Measurements and payment for sheeting and bracing ordered by Engineer left in place will be made as extra work, unless noted otherwise.
- M. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders.

END OF SECTION