

**ITEM 018040**

**Item 0180401 - TEMPORARY SHEET PILING**

**Item 0180402 - SHEET PILING LEFT IN PLACE**

**DESCRIPTION**

The Contractor shall install temporary sheet piling where shown on the plans or as ordered by the Engineer. Temporary sheet piling shall conform to the applicable safety code(s) and shall be designed to accommodate traffic; to permit access to adjacent occupied properties; to protect adjacent buildings, pavements structures and all existing utilities; to provide an opening of proper depth and width in which to install the proposed pipes and other underground structures; and to protect his workmen, employees of the Owner and Engineer, State and the public, from death or injury from bank failure, earth collapse or earth movement of any nature whatsoever.

Temporary sheet piling shall be removed from the site upon completion of the permanent work with the exception that some sections may be left in place when so ordered by the Engineer.

The use of trench shielding devices in lieu of sheet piling will not be permitted in areas where sheet piling has been directed by the Engineer.

The Contractor shall be entirely and solely responsible for the adequacy and sufficiency of all supports and of all sheeting, bracing, shoring, underpinning, cofferdamming, etc. The Contractor shall assume the entire and sole responsibility for damages on account of injury to persons or damage to adjacent pavements and public and private property (including but not limited to, the work under construction, existing buildings, facilities, etc.) which injury of damage results directly from said Contractor's failure to install or to leave in place adequate and sufficient supports, sheeting, bracing, underpinning, cofferdamming, etc.

The Contractor shall submit his proposed sheeting and/or shoring plans to the Engineer and any others required by law or as elsewhere specified prior to the installation of any sheeting and/or shoring. These plans should include, but not be limited to, the type of sheeting or shoring, sizes and dimensions, bracing, spacing, representative trench cross sections, methods of installation and removal, etc.

All sheeting shall be designed and sealed by a Professional Engineer licensed to practice in the State where the work is being performed. He shall be known as the Contractor's Engineer.

It is expressly understood and agreed that removing or leaving-in-place any sheeting or shoring, etc., shall not relieve the Contractor from any responsibility for any loss or damage whatever resulting from this work. This includes the settling of the backfill, or any movement of the ground or any structure or object adjacent to any trench or excavation made by the Contractor. The Engineer will not order any sheeting, etc. left-in-place at the expense of the City in order to accommodate the convenience of the Contractor or to save him the cost of its removal.

There shall be no obligation on the part of the Engineer to issue orders for sheeting, staybracing or sheeting left-in-place and/or to pass upon sufficiency and adequacy of sheeting; nor shall the failure on the part of the Engineer to give such orders relieve the Contractor from liability for damages on account of injury to persons or damage to property occurring from or upon the work and occasioned by negligence, or otherwise growing out of the Contractor's failure to either install sufficient and adequate sheeting and/or staybracing or to leave in place in the excavation sufficient and adequate support to prevent the caving in or moving of the ground adjacent to the sides of the excavation during and after the backfilling operation.

### **REFERENCED ITEMS**

Item 0125001

### **REQUIRED SUBMITTALS**

Certified Engineers Design Drawings:

Submit 5 copies of certified sheeting design drawings and computations as prepared by a State of Connecticut, Licensed Professional Engineer in accordance with the contract requirements.

### **MATERIALS**

Timber staybracing, shoring, and sheeting shall be in conformance with the requirements of the applicable safety code(s). Timber sheet piling may consist of any species, which will satisfactorily stand driving. It shall be timbers with square corners and shall be free from worm holes, loose knots, wind shakes, decayed or unsound portions, or other defects which might impair its strength or tightness.

The piles shall be of the dimensions shown on the plans or as directed, either cut from solid material or made by building up piles which have been securely fastened together. The piles shall be drift sharpened at their lower ends and interlocking so as to wedge the adjacent piles tightly together.

All steel sheeting shall be continuous and interlocking with materials conforming to the provisions of ASTM Specification A-328-03 or equal.

### **CONSTRUCTION METHODS**

Unless expressly authorized by the Engineer, sheeting shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting to facilitate driving, care shall be taken to avoid trimming behind the face along which the sheeting will be driven. Care shall be taken to prevent voids outside of the sheeting.

All sheeting and staybracing shall be securely installed and properly braced in accordance with the engineer's sheeting design, and local, state and federal building codes.

The depth of pilot cuts for trenches/structures shall not exceed three (3) feet in depth at any time. The Engineer may reduce the depth of the pilot cut should the soil and subsurface conditions warrant such action. Sheeting must be driven by drop hammer or other methods approved in writing by the Engineer below the area of the pilot cut. Driving of sheeting above the pilot cut is subject to the directions of the Engineer. The Engineer may direct the Contractor to use other types of equipment, and to revise the procedure during the excavation of the pilot cut and the driving of the sheeting should it be found necessary to do so.

Vibratory driving hammers shall not be used unless specifically indicated on the plans, or authorized by the Engineer.

Sheeting shall be driven to adequate depths below the trench excavation limits to serve as toe-ins for properly securing sheet piling and as applicable safety codes require.

Backfilling of sheeted trenches/areas shall proceed by one of the following two methods:

1. Simultaneously with the withdrawal of sheeting and as each layer is compacted in accordance with other appropriate bid items.
2. The trench/area will be backfilled to the surface. If the sheeting is to be withdrawn, backfilling will proceed up to each set of rangers and braces; the rangers and braces will be removed; the backfilling will proceed up to the next set of rangers and braces, etc. up to the top of the excavation. The backfill material shall be compacted to 95% of the maximum dry density as determined by AASHTO T-180-01, Method

D. Alternate sections of sheeting from the left side and right side of the trench/area shall be removed and the cavity remaining therefrom shall be jetted thoroughly by high pressure water, starting at the top of the sheeting and being drawn to the surface. Sand shall be inserted with the jetting process.

Where the bottom of the excavation is not free draining material (some areas of organic material or miscellaneous fill) or where granular backfill is not available or ordered by the Engineer, the jetting shall be very carefully done with a minimum amount of water being expended. In such locations, the contractor may request the approval of the Engineer for other compaction methods in the sheeting cavity.

The Contractor shall remove the sheeting and/or staybracing from the excavation except where it is specifically ordered by the Engineer or the Contractor may elect to leave in place the sheeting and/or staybracing for his own convenience or to serve his own interest to protect existing facilities, the work built or to be built under this Contract, or for the safety of the public, etc., at no cost to the Owner, with the permission of the Engineer. No sheeting or bracing which is within two feet of the existing or proposed finished grade may be left-in-place without the prior permission of the Engineer. This may require that the Contractor cut off sheeting at this elevation and at no additional cost to the Owner.

Where sheeting, regardless of the type of sheeting used, is left in place, as specified or ordered unless otherwise specifically permitted in writing by the Engineer, all elements such as rangers, braces, wales, etc. shall be left in place except as specified hereinbefore; and, except such temporary braces required to be removed to make way for the structure/utility. Where it is necessary to remove such temporary braces, the sheeting shall be re-braced but in no case shall the sheeting be braced against the sides of the structure/utility. Where lagging and "soldier" beams are used, the "soldier" beams and all the braces shall also be left in place.

Where wood sheeting has been driven below the excavation bottom to provide for a "toe-in", no wood sheeting below the top of pipe or structure shall be removed but cut off at this elevation and the remaining sheeting above this line removed as described herein. There will be no payment made for this work or for the wood sheeting left-in-place.

Sheeting shall be cut away and removed from in front of capped outlets or other branches or inlets set in the pipe for future connections.

All sheeting, shoring and bracing removed shall be carefully removed from the excavation in such a manner as not to endanger the completed work or any adjacent pavements, buildings, structures, utilities, property, etc. The sheeting shall be withdrawn to such an extent that it is just above the backfill material being compacted and all voids left or caused by the withdrawal of such sheeting, shall be immediately refilled with approved material and compacted at no additional cost.

Where the excavation is to be left open during non-working hours, the sheeting shall extend a minimum 42 inches above existing grade to protect pedestrian and vehicular traffic from the open excavation. If ordered by the engineer, barricades and warning lights will be used to supplement protection. Should this work be conforming to the requirements of item 0125001 "Maintenance and Protection of Traffic" or as directed by the engineer.

### **METHOD OF MEASUREMENT**

Temporary sheet piling will be measured for payment by the number of square feet of temporary sheet piling completed and accepted, as computed from the bottom of the excavated trench (which shall be no more than 6" below the pipe elevation) to the surface of the existing ground as measured along the centerline of the pipe.

No measurement will be made of end extensions, or toe-ins necessary for the safety of the retained facility. Sheeting ordered left in place by the City shall be measured for an additional payment by the square foot. This area will be measured or computed in the same manner as described above.

Sheet piling left in place solely at the Contractor's option, with the Engineer's permission, will not be paid for at the contract unit price per square foot for "SHEET PILING MATERIAL LEFT IN PLACE." All sheet piling left -in-place as ordered by the Engineer shall have a additional payment at the contract unit price under Item 0180402.

### **BASIS OF PAYMENT**

Payment for this work will be made at the contract unit price per square foot for "TEMPORARY SHEET PILING," measured as described above, which price shall

include all materials, equipment and labor incidental to the construction and removal of the temporary sheet piling required at the locations specified on the plans.

Sheet piling ordered left in place will have an additional payment at the contract unit price per square foot for "SHEET PILING LEFT IN PLACE." This payment will be in addition to the payment made under item 0180401.

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>PAY UNIT</u>
0180401	Temporary Sheet Piling	SF
0180402	Sheet Piling Left in Place	SF