

**DIVISION 31 – EARTHWORK
SECTION 31 40 00 – SHORING AND UNDERPINNING**

PART 1 – GENERAL

1.01 RELATED WORK

- A. Section 31 23 33 – Trenching and Backfilling for Utilities.

1.02 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Shoring materials and installation work shall conform to Federal, State and local laws, rules, regulations, requirements, precautions, orders and decrees.
 - 2. Provide material for sheet piling, sheeting, bracing and shoring, and drive or set in place in accordance with Federal, State and local laws for excavations and construction; and as required to protect the workers and the public, or to maintain the trench widths specified regardless of whether the same is or is not considered necessary by the Contractor.

1.03 SITE CONDITIONS

- A. Responsibility for Condition of Excavation:
 - 1. The failure or refusal of the Engineer to suggest the use of bracing or sheeting, or a better quality, grade, or section, or larger sizes of steel or timber, or to suggest sheeting, bracing, struts, or shoring to be left in place; shall in no way or extent relieve the Contractor of his responsibility concerning the condition of excavation or of his obligations, nor impose liability on the Engineer or the Authority; nor shall a delay, whether caused by an action or want of action on the part of the Contractor, or by an act of the Engineer, Authority, or their agents, or employees, resulting in the keeping of an excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from caving or slipping, nor from his obligations relating to injury to persons or property.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Wood Materials: Use wood sheeting, sheet piling, bracing and shoring which is in good serviceable condition and timbers of sound condition, free from large or loose knots and of proper dimensions.
- B. Steel Materials: Steel sheet piling and bracing of equal strength may be substituted for wood.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Using skilled labor, drive or set sheeting, sheet piling, braces or shores in place and arrange such that they may be withdrawn as the excavations are backfilled, without injury to piping and structures, and without injury to or settlement of adjacent structures and pavements.
- B. When tight plank or steel sheeting is required, drive such sheeting in advance of the excavation. Make joints of tongue and groove or interlocking type and as watertight as possible.
- C. Where the maximum width of trench may be exceeded under these Specifications and where permitted by Federal and State regulations, the sides of the trench may be sloped in lieu of providing sheeting and bracing. If the sloping of trench banks is permitted, the slope shall begin at a point of 12" above the top of the pipe. Install sheeting to support the vertical part of the excavation as required by Federal and State regulations.
- D. Remove sheeting, bracing and shores as trenches and other excavations are being backfilled, except where and to such an extent as the Engineer shall require, in writing, that same be left in place or where he shall permit the Contractor to leave same in place at the Contractor's own request.
 - 1. In withdrawing sheeting and sheet piling, exercise care to ensure that all voids or holes left by planks as they are withdrawn are backfilled and thoroughly rammed with thin rammers provided especially for that purpose.
 - 2. Exercise care to carry backfill up evenly on all sides of items installed in excavations.
- E. Cut off sheeting or sheet piling left in place whenever and at such points as the Engineer shall require and remove from the work the portion cut off.

END OF SECTION