

ITEM 16552.10 M - PERMANENT TIMBER SHEETING

ITEM 16552.11 M - PERMANENT STEEL SHEETING

ITEM 16552.12 M - TEMPORARY TIMBER SHEETING

ITEM 16552.13 M - TEMPORARY STEEL SHEETING

ITEM 16552.14 M - INTERIM TIMBER SHEETING

ITEM 16552.15 M - INTERIM STEEL SHEETING

ITEM 16552.16 M - EXCAVATION PROTECTION SYSTEM

DESCRIPTION

Permanent Sheeting. Under this work, the Contractor shall furnish and place permanent sheeting of the type, at the locations and to the elevation(s) shown on the plans.

All the sheeting and supports will be left in place as a finished structure unless removal of waling and bracing is called for on the plans.

Temporary Sheeting. This work shall include the requirements specified above in Permanent Sheeting with the following addition:

The Contractor shall be required to maintain the sheeting while in place, and remove it from the job site after its function has been accomplished or when ordered by the Engineer. It may be left in place only with the written permission of the Engineer.

Interim Sheeting. Under this work, the Contractor shall furnish and place sheeting of the type, at the locations and to the elevation(s) shown on the plans.

The Contractor shall be required to maintain the sheeting while it is serving its function.

The interim sheeting shall be cut off and removed only to the elevation shown on the plans. The remaining material shall be left in place.

Excavation Protection System. Under this work, the Contractor shall design, furnish, place, maintain and remove an excavation protection system (EPS) at locations shown on the plans or as ordered by the Engineer. Details of the EPS must conform with the requirements of Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA), and installation shall be in accordance with the State and Federal Safety Codes. A sloping (layback) option will not be allowed.

Sheeting, shoring, a shield system, i.e. trench box or trench shield or other pre-engineered protective system may be used to prevent cave-ins. The requirements of any protective system shall be as contained in Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA). It may be left in place only with the written permission of the Engineer.

Alternate Design

The Contractor may submit to the Department a construction alternate other than that presented in the contract documents. Slope lay back will not be allowed. Any geotechnical analysis for a flexible support system shall be done in accordance with the procedures contained in the appropriate departmental publication which is current on the date of advertisement for bids. This

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publication is available upon request to the Regional Director or the Director, Geotechnical Engineering Bureau. All of the requirements and conditions contained in Subsection 110-02 Value Engineering shall apply.

MATERIALS

Permanent Sheeting

- A. **Permanent Timber Sheeting.** Timber sheeting shall be new and unused and consist of any acceptable species which can be placed satisfactorily. The sheeting shall have a preservative treatment conforming to the American Wood-Preservers Association (AWPA) Standard C-2, Soil Contact. The timbers shall not be less in actual cross section or stress grade than that shown on the plans. Stress grading and acceptance shall be in accordance with the requirements and provisions of Subsection 712-14, Stress Graded Timber and Lumber. The timbers shall be sound and free from any defects which might impair its strength or tightness. The materials shall include all necessary waling and bracing required.
- B. **Permanent Steel Sheeting.** Steel sheeting shall be new and unused conforming to the requirements of ASTM A328M unless otherwise indicated on the plans. Waling and bracing shall be new and unused conforming to the requirements of ASTM A36M unless otherwise indicated on the plans. The sheeting shall not have a section modulus less than that shown on the plans. Stock steel may be used. The Contractor shall furnish to the Engineer, certified copies of physical and chemical test results which shall include a sworn statement by a qualified mill representative to the effect that the subject material conforms to the requirements of the steel specified.

Temporary Sheeting

- A. **Temporary Timber Sheeting.** The Materials provisions of Permanent Timber Sheeting shall apply with the following modifications:

The timber sheeting may consist of new or used, treated or untreated material but must be in satisfactory condition and suitable for the intended use. The Engineer may disapprove and reject used materials regarded to be unsatisfactory.

- B. **Temporary Steel Sheeting.**

The steel sheeting, waling and bracing may consist of new or used material but must be in satisfactory condition and suitable for the intended use. The section modulus of the sheeting shall not be less than that shown on the plans. The materials shall include all

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necessary waling and bracing required. The Engineer may, disapprove and reject used materials regarded to be unsatisfactory.

Interim Sheeting

- A. **Interim Timber Sheeting.** The Materials provisions of Temporary Timber Sheeting shall apply.
- B. **Interim Steel Sheeting.** The Materials provisions of Temporary Steel Sheeting shall apply.

Excavation Protection System. The selection of EPS materials shall be the Contractor's option. The Engineer may disapprove and reject materials regarded to be unsatisfactory.

CONSTRUCTION DETAILS

General. Any material which stops the driving of sheeting within a depth of three meters from the ground surface at the time of driving, shall be removed by the Contractor. Payment for removal of such material will be made under the appropriate excavation item. If very compact material or boulders prevent the progression of the sheeting to the design tip elevation at a greater depth, the Contractor shall notify the Engineer.

Temporary Sheeting. The Construction Details requirements contained above in **General** shall apply with the following addition:

Upon completion of the structure, the Contractor will remove the sheeting placed under this work, or with the written permission of the Engineer, leave it in place after cutting off the tops at an agreed elevation.

Interim Sheeting. The Construction Details provisions contained in **General** shall apply with the following modification:

The interim sheeting shall be cut off and removed only to the elevation shown on the plans. The remaining material shall be left in place.

Excavation Protection System. The EPS installed under this item shall be of sufficient size and strength to meet the requirements of Title 29, Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA), and the Live Load requirement as contained in the Standard Specifications for Highway Bridges adopted by AASHTO. Prior to use, the Contractor shall supply the Engineer with documentation of compliance.

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All damage to the adjacent pavement or ground caused by the use of the chosen EPS (eg. Voids beneath the pavement or shoulder, pavement or shoulder cracking or subsidence, ground settlement) shall be repaired to the satisfaction of the Engineer at no additional cost to the State. Severe damage which directly affects the safety of the public shall be immediately repaired to the satisfaction of the Engineer. The operation shall be halted until a satisfactory prevention method is instituted.

METHOD OF MEASUREMENT

Permanent Sheeting. The quantity of sheeting to be paid for shall be the number of square meters obtained by multiplying the vertical length of sheeting measured between the payment lines herein described, by the horizontal length of sheeting shown on the plans or approved by the Engineer. The vertical length of sheeting is that length measured between the upper and lower payment lines. The upper payment line, unless otherwise specified on the plans or approved by the Engineer, shall be the original ground at the time of commencing work. The lower payment line shall be the elevation shown on the Plans as the minimum embedment depth unless otherwise authorized in writing by the Engineer.

The horizontal length shall be measured along a projection of the sheeting on a plane parallel to and midway between the front and rear face of the sheeting wall.

Temporary Sheeting. The Method of Measurement provisions for Permanent Sheeting shall apply.

Interim Sheeting. The Method of Measurement provisions for Permanent Sheeting shall apply.

Excavation Protection System. The quantity of protection system to be paid for shall be the number of square meters obtained by multiplying the vertical length measured between the payment lines herein described, by the horizontal length of EPS shown on the plans or approved by the Engineer. The vertical length is that length measured between the upper and lower payment line. Unless otherwise specified on the plans, the upper payment line shall be the ground surface existing at the site prior to the beginning of the work, or as ordered, in writing, by the Engineer. Unless otherwise indicated on the plans or in the proposal, the lower payment line shall be the bottom of the excavation shown on the plans immediately adjacent to the protection system. The horizontal length shall be the actual length of protection system installed measured along the payment lines as shown on the contract plans. Both sides of the excavation shall be measured and computed for payment.

Stage Construction. When the support system is used in stage construction, the quantity of support system to be paid shall be the maximum number of square meters satisfactorily installed between the payment lines shown in the Contract Documents measured on either, but not both sides, of adjacent construction stages.

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BASIS OF PAYMENT

Permanent Sheeting. The unit price bid, per square meter, for this work shall include the cost of furnishing all labor, materials and equipment necessary to complete this work, including driving equipment, waling, bracing and design services when employed. The cost of maintaining the excavated area free from earth, water, ice, and snow will be included in the price bid for the appropriate excavation item.

Temporary Sheeting. The Basis of Payment provisions for Permanent Sheeting shall apply except that estimate payments in the amount of 75% of the bid amount shall be made upon installation of the sheeting with the remainder paid upon its satisfactory removal. If the Contractor leaves all or part of the sheeting in place, it will be at their own expense and the remaining 25% of the bid amount shall be paid after its function is no longer required.

Interim Sheeting . The Basis of Payment provisions for Permanent Sheeting shall apply except that estimate payments in the amount of 75% of the bid amount shall be made upon installation of the sheeting with the remainder paid upon satisfactory removal of that portion specified in the contract documents. If the support system is to be left in place in its entirety, the remainder shall be paid after its function is no longer required. The cost of any work necessary to cut off and remove the specified portion shall be included in the unit price bid.

Excavation Protection System. The unit price bid, per square meter, for this work shall include the cost of furnishing all labor materials and equipment necessary to complete this work, including driving equipment, waling, bracing, and design services when employed.

If the Engineer, in writing, orders that the EPS be left in place, this will be classified as extra work and will be paid for in accordance with Subsection 104-03, Contingencies, Extra Work, Deductions.