

ITEM 551.0460NN08 – HOLES IN EARTH FOR SOLDIER PILE AND LAGGING WALL
ITEM 551.0461NN08 – ROCK SOCKETS FOR SOLDIER PILE AND LAGGING WALL
ITEM 551.0462NN08 – INSTALLING SOLDIER PILES FOR SOLDIER PILE AND LAGGING WALL
ITEM 551.0463NN08 – INSTALLING LAGGING FOR SOLDIER PILE AND LAGGING WALL

DESCRIPTION

This work shall consist of furnishing, installing and maintaining a soldier pile and lagging wall in accordance with the contract documents and as directed by the Engineer. Cut off walls within the roadway limits and leave in place. Completely remove walls outside the roadway limits if noted on the plans. Dispose of removed material.

All proposed changes to details shown on the plans must be approved, in writing, by the Deputy Chief Engineer of the Technical Services Division.

MATERIALS

Structural Steel

Provide soldier piles, waling and bracing as shown on the plans conforming to the provisions of §715-01 Structural Steel.

Used material is permitted for walls unless otherwise noted on the plans, provided the material is in conformance with the specification and is acceptable to the Engineer.

Lagging

Provide the lagging type(s) shown on the plans:

Treated wood graded for an extreme fiber stress of at least 6.9 MPa conforming to the provisions of §712-14 Stress Graded Timber and Lumber with the full dimension thickness shown on the plans.

Provide preservative treatment conforming to the American Wood Preserves Institute (AWPA) Standard C-2, Soil Contact.

Untreated wood graded for an extreme fiber stress of at least 6.9 MPa conforming to the provisions of §712-14 Stress Graded Timber and Lumber with the full dimension thickness shown on the plans.

Precast concrete panels conforming to the provisions of Section 704-03 Precast Concrete-General except the concrete shall have a minimum compressive strength of 42MPa at 28 days and the bar reinforcement shall meet the requirements of Section 709-11 Galvanized Bar Reinforcement, Grade 420.

Steel sheeting with a minimum section modulus conforming to the provisions of §552-2 Materials.

Backfill for Holes

Provide backfill material shown on the plans:

Concrete Backfill: Class G concrete conforming to the provisions of Section 555 - Structural Concrete.

Grout Backfill: Provide a workable mixture of cement, concrete sand and water capable of stabilizing the hole and being excavated. Use cement, concrete sand and water conforming to the following provisions:

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| Material | Subsection |
|------------------------|------------|
| Portland Cement Type 2 | §701-01 |
| Concrete Sand | §703-07 |
| Water | §712-01 |

The current Departmental Controlled Low Strength Material specification is an acceptable alternative to the grout backfill.

CONSTRUCTION DETAILS

A. General

Perform work in a manner that causes no subsidence of the surrounding ground surface. If subsidence should occur, cease work and provide a written plan to prevent subsidence to the Engineer for review. Resume work after the Engineer has approved the plan in writing. Repair all damage that resulted from the subsidence at no additional cost to the State.

Provide splices for soldier piles conforming to the provisions of §551-3.01 C.2.a. Preparation of Piles, Splices, General.

Install the Soldier Piles either by driving or by placing them in holes as indicated on the plans in accordance with the following tolerances:

1. Plan tolerance of 25 mm at the top of pile, verified by survey methods.
2. Vertical tolerance of 12.5 mm per 3 m on each axis of the soldier pile shown on the plans. Verify the axes on the top 1.5 m of the soldier pile with a straight edge (1.5 m minimum length) and a level (1.2 m minimum length).

For each pile out of tolerance, provide a satisfactory replacement or provide a modification approved by the Engineer prior to proceeding.

B. Driving Piles

Equip soldier piles with shoes in conformance with provisions of §551-3.01 C.1.a. Preparation of Piles, Shoes, Steel Bearing Piles, and drive in conformance with provisions of §551-3.01 D. Equipment for Driving Piles, except that submission of Form BD 138 is not required.

C. Placing Piles in Holes

Provide equipment capable of establishing holes of the minimum diameter and to the depth or elevation shown on the plans. Temporary sleeves or casings are permitted and may be required as per the plans. Jetting is not permitted.

If the assumed top of socket elevation shown on the plans varies by more than 0.6 m, stop work and notify the Engineer. The Engineer will notify the Geotechnical Engineering Bureau and obtain written recommendations prior to allowing the work to proceed.

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After placing the piles, backfill holes with the backfill(s) indicated on the plans.

D. Backfilling

Concrete Backfill: Place backfill in accordance with the provisions of §555-3.04 Handling and Placing Concrete and §555-3.05 Depositing Structural Concrete Under Water in all rock sockets shown on the plans. Provide a minimum curing time of one (1) day before placing any lagging.

Grout Backfill: Place backfill in accordance with the provisions of §555-3.04 Handling and Placing Concrete and §555-3.05 Depositing Structural Concrete Under Water. Provide a minimum curing time of one (1) day before placing any lagging.

E. Lagging

Install horizontal lagging in a manner approved by the Engineer so that the unsupported soil height is a maximum of one (1) meter at all times. If the method chosen for attaching the lagging to the soldier piles requires reattachment of lagging to the soldier piles due to planned excavation on both sides of the wall, reattach the lagging at no additional cost to the State.

Fabricate the precast concrete lagging to the shape and size shown on the plans.

Precast panels manufactured in strict conformance with the plans do not require shop drawings. When shop drawings are not required, notify the Engineer, in writing, of the Fabricator's intention to manufacture the panels in accordance with the plans. The Director of the Materials Bureau will be notified by the Engineer of the Contractor's/Fabricator's intention and will institute appropriate approval notifications.

If the precast panels are not fabricated in strict conformance with the plans, submit shop drawings through the Engineer to the Materials Bureau for written approval a minimum of 30 working days before beginning fabrication. Shop drawings must conform to the requirements of §704-03, Precast Concrete-General.

Panels manufactured without prior written approval from the Materials Bureau will not be accepted.

F. Wall Removal

Cut off soldier piles placed within the roadway limits at the subgrade surface unless otherwise noted on the plans.

Soldier piles placed outside the roadway limits may be removed or cut off a minimum of 0.6 m below final ground surface unless otherwise noted on the plans.

If lagging is to be removed, remove the lagging in a manner approved by the Engineer so that the unsupported soil height is a maximum of one (1) meter at all times. This maximum height may be reduced, based on specific site conditions, in order to prevent collapse and loss of ground.

METHOD OF MEASUREMENT

Holes in Earth

This work will be measured as the number of meters of holes in earth satisfactorily installed, as measured in the field, in accordance with the contract documents and as directed by the Engineer. The upper

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payment limit, unless otherwise specified on the plans or revised in writing by the Engineer, is the actual intersected grade or ground line whichever is lower. For holes requiring rock sockets, the lower payment limit is the top of rock as shown on the plans or revised, in writing, by the Engineer. For holes without rock sockets, the lower payment limit is the pile tip elevation as shown on the plans or revised, in writing, by the Engineer.

Rock Sockets

This work will be measured as the number of meters of sockets in rock satisfactorily installed, as measured in the field, in accordance with the contract documents and as directed by the Engineer. The upper payment limit is the top of rock as shown on the plans or revised, in writing, by the Engineer. The lower payment limit is the pile tip elevation as shown on the plans or as revised, in writing, by the Engineer.

Installing Soldier Piles

This work will be measured as the number of meters of soldier piles satisfactorily installed, as measured in the field, in accordance with the contract documents and as directed by the Engineer. The upper payment limit is the pile top elevation as shown on the plans or as revised, in writing, by the Engineer. The lower payment limit is established as the tip of the soldier pile driven or placed to the elevation shown on the plans or as revised, in writing, by the Engineer.

Installing Lagging

This work will be measured as the number of square meters of lagging satisfactorily installed in accordance with the contract documents and as directed by the Engineer.

BASIS OF PAYMENT

Holes in Earth

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including progressing the hole through obstructions.

Rock Sockets

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

Installing Soldier Piles

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including pile driving equipment, equipment for excavating holes, pile shoes, splices, backfilling the hole and cutting off the soldier pile where required. No additional payment will be made for complete pile removal, where allowed, or for splices when the pile exceeds the estimated length.

Installing Lagging

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including waling, bracing, connections and lagging removal, where required. No additional payment will be made when a wall is excavated on both sides. No additional payment will be made if wood lagging is placed behind concrete.

NOTE: nn denotes serialized pay item, see §101-02.