

CONCRETE RETAINING WALL

****These provisions are for providing bidders with options for furnishing a concrete retaining wall system for a project.**

****From Wardsboro BHF 0114(5)**

- xx. DESCRIPTION. This work shall consist of designing, fabricating, furnishing, and erecting concrete retaining walls at the locations specified and in conformance with the lines and grades shown on the Plans or as directed by the Engineer.
- xx. DESIGN REQUIREMENTS. The design shall be performed in accordance with the AASHTO *LRFD Bridge Design Specifications* and the design criteria specified in the Plans.

Acceptable earth retaining systems are those included in the "VAOT Earth Retaining System Selection Chart", available on the Agency's website at the following address:
<http://www.aot.state.vt.us/matres/Documents/ACROBAT.pdf/S&FDox/VAOT%20APPROVED%20Retaining%20Walls%2012-2008.pdf>.

Prefabricated earth retaining systems shall employ concrete facing.

- xx. MATERIALS. Materials shall meet the following requirements:
- (a) Precast Concrete. Precast concrete shall meet the requirements of Section 540.
- If the concrete piece is cast at the same facility where the concrete is batched, the concrete shall be mixed a minimum of 150 revolutions prior to discharge into the forms. If bagged silica fume is used, the revolutions shall be increased to a minimum of 200.
- Concrete will be sampled in accordance with AASHTO T 141 and tested for slump in accordance with AASHTO T 119M/T 119 or for flow in accordance with ASTM C 1611, Procedure B. The concrete will be tested once for every 19.1 cubic meters (25 cubic yards) placed.
- (b) Cast-in-Place Concrete. Cast-in-place concrete shall meet the requirements of Section 501 for Concrete, High Performance Class B, unless otherwise approved by the Engineer.
- (c) Backfill. Backfill material shall meet the requirements of Section 204 for Granular Backfill for Structures, unless otherwise specified by the wall manufacturer.

- xx. SUBMITTALS. Working Drawings shall be submitted to the Structures Engineer in accordance with Section 105. The submittal shall include, but not be limited to, detailed design computations and details, dimensions, quantities, and cross sections necessary to construct the wall, and the following information:

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- (1) A plan view of the wall showing the limit of the widest module, tiebacks, nails, mesh, or strip and the centerline of any drainage pipe which is behind or passes under or through the wall.
- (2) Any general notes required for the construction of the wall.
- (3) All horizontal and vertical curve data affecting wall construction.
- (4) Cross-sections showing the limits of construction and fill sections, and the limits and extent of backfill material placed above original ground.
- (5) Limits and extent of reinforced soil volume.
- (6) All details including reinforcing bar bending details.
- (7) All details for foundations and leveling pads, including details for steps in the footings or leveling pads, as well as design maximum and minimum bearing pressures.
- (8) All modules and facing elements shall be detailed. The details shall show all dimensions necessary to construct the element, all reinforcing steel in the element, and the location of reinforcement element attachment devices in the facing.
- (9) A detailed construction manual. All details for construction of the wall around guardrail posts, drainage facilities, overhead sign footings, and abutment piles shall be clearly shown.
- (10) All details for connections to existing structures, traffic barriers, coping, parapets, noise walls, and attached lighting.
- (11) All details for joints and joint materials.
- (12) All drainage details.
- (13) Detailed design computations, including a detailed explanation of any symbols and computer programs used in the design of the wall.

The submittal(s) shall be signed, stamped, and dated by a qualified registered Professional Engineer licensed in the State of Vermont or eligible to practice engineering in the State of Vermont under transient practice provisions of Title 26 VSA, Section 1181a.

All design and construction details will be checked by the Structures Section and the Materials & Research Section. Approval of the detailed design and plans, and notification to begin construction, will be made by the Structures Section. The

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Contractor shall allow the Agency 30 calendar days to review and approve the Working Drawings.

- xx. PRECAST CONCRETE INSPECTION. Precast concrete inspection will be in accordance with Subsection 540.06.

The Fabricator shall provide a tentative casting schedule to the Engineer and Structural Concrete Engineer for the following casting week a minimum of 3 calendar days prior (a casting week will be Sunday to Saturday). The Fabricator shall maintain a Quality Control file that shall contain at a minimum the piece identification, date and time cast, concrete test results, quantity of concrete used per element, batch quantity printout, cylinder results, and aggregate gradation and moisture.

- xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Concrete Retaining Wall) to be measured for payment will be the number of square meters (square feet) of exposed face of retaining wall complete and in place in the accepted work. The height of the exposed face shall be the difference between the top of the wall and the top of the stone fill along the front face of the retaining wall. The location shall be as shown on the Plans or as directed by the Engineer.

- xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Concrete Retaining Wall) will be paid for at the Contract unit price per square meter (square foot). Payment will be full compensation for designing, fabricating, and installing the materials specified, including but not limited to the geotextile fabric, backfill material, concrete, bar reinforcement and welded steel wire fabric, and expansion material; any excavation, sheeting, bracing, dewatering, and siltation control; preparing and submitting Working Drawings; and for furnishing all labor, tools, equipment, and incidentals necessary for properly constructing, in the dry, a concrete retaining wall.

Any grouting work, such as fairing out unevenness between adjacent concrete pieces and filling leveling screw holes, shear keys, transverse anchor recesses, and dowel holes, is considered incidental to the work for Special Provision (Concrete Retaining Wall).

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.670 Special Provision (Concrete Retaining Wall)	Square Foot
900.675 Special Provision (Concrete Retaining Wall)	Meter