

ITEM 615.67 10 M – CONCRETE BOAT RAMP

DESCRIPTION

This work shall consist of designing and constructing a reinforced concrete boat ramp of the type, size, configuration and components at the location shown on the Plans. This work includes all Portland Cement Concrete, reinforcement, subgrading, tools and hardware necessary to complete the concrete boat ramp.

MATERIALS

A. GENERAL

Unless an exception is noted, the materials for this work shall meet the requirements of the NYSDOT Standard Specifications:

Geotextile Separation Material	207-2
Portland Cement Concrete	501-2
Coarse Aggregates	703-02
Epoxy Coated Bar Reinforcement	709-04
Structural Steel	715-01

B. HARDWARE

All hardware, which shall include but not be limited to bolts, nuts, washers, nails, spikes, anchors and screws, shall conform to ASTM Designation A307, Grade "A", and shall be hot-dipped galvanized steel in the manufacturing process. Galvanizing bath shall be free of ferrous impurities. Galvanizing shall be in accordance with Subsection 719-01 Type II.

CONSTRUCTION DETAILS

A. GENERAL

The Contractor shall provide complete design details of the ramp structure and a proposed sequence of construction activities. Six copies of the design detail shop drawings and two copies of design calculations shall be provided to the Engineer at least 45 working days prior to fabrication. The shop drawings shall be subject to the approval of the Engineer. All drawings and design calculations shall be stamped by a Professional Engineer licensed and registered to practice in New York State.

B. SITE GRADING

The Contractor shall grade all areas required to achieve the design subgrades and final grades as defined by the drawings and all areas disturbed during excavation or borrow operations at the completion of those operations.

Final surfaces shall be uniform and smooth with rounded tops and bottoms. Grading of excavated or borrow areas shall promote free water drainage. Tolerances after final

ITEM 615.67 10 M – CONCRETE BOAT RAMP

placement from the design subgrades as required by the drawings are as follows:

Embanked and Excavated Surfaces	± 25.4 mm
Concrete Slab Subgrade:	+0 – 25.4 mm
Subgrade for Graded Crushed Stone	+0 – 25.4 mm
Final Compacted Grade for Graded Crushed Stone	+25.4mm – 0

C. LAUNCH RAMP SLAB CONSTRUCTION

General

The Contractor shall construct and install the reinforced concrete launch ramp as detailed on the drawings and specified herein. The lower (in-water) portion of the launch slab has been designed to be cast on shore (in the dry) and pushed into place upon the crushed stone subbase. The upper portion shall then be cast-in-place against the lower portion.

The construction of the concrete launch ramp shall generally be as follows. Once site grading begins, the work shall be completed in the sequence submitted by the Contractor with the minimum necessary gap between construction activities.

A. **Base Preparation** - The existing shore shall be graded to designed slope and elevations to accept the push slab portion of the ramp in its final design position. Base grade shall be as even as practicable, free from any irregularities, and graded 600mm wider than design ramp width on both sides of ramp. Grading shall extend shoreward at the slope as shown on the drawings and allow sufficient room to cast the push slab portion of the ramp. The underwater portion of the subbase requires constant monitoring to assure that the proper grade is achieved. Steel beams shall be placed on the subgrade as detailed on the drawings and before the placement of the crushed stone. The crushed stone shall be screeded to the top surface of the steel beams. The beams shall be anchored into the earth to prevent movement from the push slab being pushed into its final position.

B. **Casting the Push Slab**

The push slab portion shall be cast only after the approval of all subbase preparation. To prevent the slab pour from penetrating the base material, the form bottom shall be leveled with sand and lined with 6 mil polyethylene film. It shall be cast as close as practicable to the waters edge. Cast in place anchor bolts shall be formed in as detailed on the drawings to provide fastening for the timber push beam and to act as ties between the upper and lower slab sections. The slab surface shall be textured as specified below.

C. **Positioning of Lower Ramp Slab**

After casting, the push slab portion shall be cured in accordance with NYSDOT Standard Specifications. Under no condition shall the slab be moved prior to 14 days from the date of pour.

A timber beam shall be securely bolted in place as detailed on the drawings to provide a pushing edge for the slab.

ITEM 615.67 10 M – CONCRETE BOAT RAMP

The push slab, as detailed, is estimated to weigh approx. 31 metric tons. A submittal shall be required for approval specifying the bulldozer and supplemental equipment large enough to push the slab into its final position.

The pushing shall be accomplished with the dozer square to the pushing edge with the blade edge centered on the timber. Timber shims shall be used to provide full bearing. When pushing commences, the blade hydraulics shall be in the float position to prevent forced vertical alignment. It is the Contractor's responsibility to maintain all design grades and elevations.

D. Upper Ramp Slab Construction

Geotextile separation material shall be installed as shown on the plans and in conformance with NYSDOT Specifications §207-3. With the push slab portion in its final position, the cast in place portion shall then be constructed. The base material shall be regraded and compacted, forms set, push beam removed from the top of the push slab ramp, reinforcement placed and secured, and concrete poured.

E. Grooved Surfaced Launch Ramp Areas

Surfaces shall receive a special grooved surface using tools as detailed on the drawings and specified herein.

The finishing tool shall be 610 mm long and 508 to 610 mm wide with a total weight of approximately 11.4 kg. The actual V-groove finish is imparted to the fresh concrete by approximately ten 19 mm x 19 mm x 3 mm angles. The tool is designed to be screwed onto a length of 13 mm diameter steel pipe which is used for a handle (weight may have to be added to the tool to get full depth of the grooves as detailed on the drawings.). The Contractor shall provide two additional hand tools described as follows: size tool to be 152 mm to 203 mm long and about 102 mm or 127 mm wide with 19 mm x 19 mm x 3 mm angles trimmed off at one end at a 60° angle to allow cleaning up the ends of the V-grooves immediately adjacent to the concrete forms.

The following procedure is recommended:

- 1) The Contractor shall plan his placements so that concrete surfaces can be properly finished. Plan construction joints to occur only at control joint locations.
- 2) The Contractor shall exercise great caution in the timing of his concrete placements, and not get unreasonably ahead of the finishers. He shall be sensitive to heat and wind and not allow the concrete to "suddenly set" and thereby prevent the proper formation of the surface grooves.
- 3) The concrete shall be placed, vibrated, screeded, etc., as per normal procedures, making sure the aggregate is tamped approximately 12.7 mm deep and the surface floated smooth with a wood float.

- 4) Finish work shall be started at one corner of the lower end of the ramp and

ITEM 615.67 10 M – CONCRETE BOAT RAMP

proceed upward with the grooves oriented 60°, refer to drawings for specific details.

Finish work shall proceed when the concrete has reached the proper consistency whereby smooth, crisp grooves can easily be formed.

5) The actual forming of the grooves is accomplished by pushing and pulling the finish tool back and forth across the surface of the wet concrete. The length of the tool gives good stability and the tool shall track nicely if one of the angles on the bottom is overlapped into the last previously formed groove. When the concrete is ready for finishing, two passes of the V-groove tool will usually form crisp, clean grooves. The Contractor may use a long straight length of “2x4” or “2x6” as a guide board for the finish tools. The finishers on both sides of the lane work off of the same side of the guide board and then gradually move it up the slope as each section of the ramp surface is finished.

6) Because of the rectangular shape of the finishing tool, it is difficult to work the tool up close to the concrete forms on each side of the lane, especially since the grooves are 60° to the forms. The Contractor shall provide two additional hand tools to be used as a follow up behind the main grooving work. These tools will also be used to touch up any unacceptable grooved areas after using the larger finishing tool.

METHOD OF MEASUREMENT

Payment of the Concrete Boat Ramp Item shall be made on a lump sum basis. .

BASIS OF PAYMENT

The lump sum price bid shall include the cost of all design, labor and materials including concrete, reinforcement, steel beams, crushed stone, subgrading, hardware, and equipment necessary to complete the work in accordance with the Contract Plans, Specifications and as directed by the Engineer.