East Lyme Public Trust Foundation, Inc.

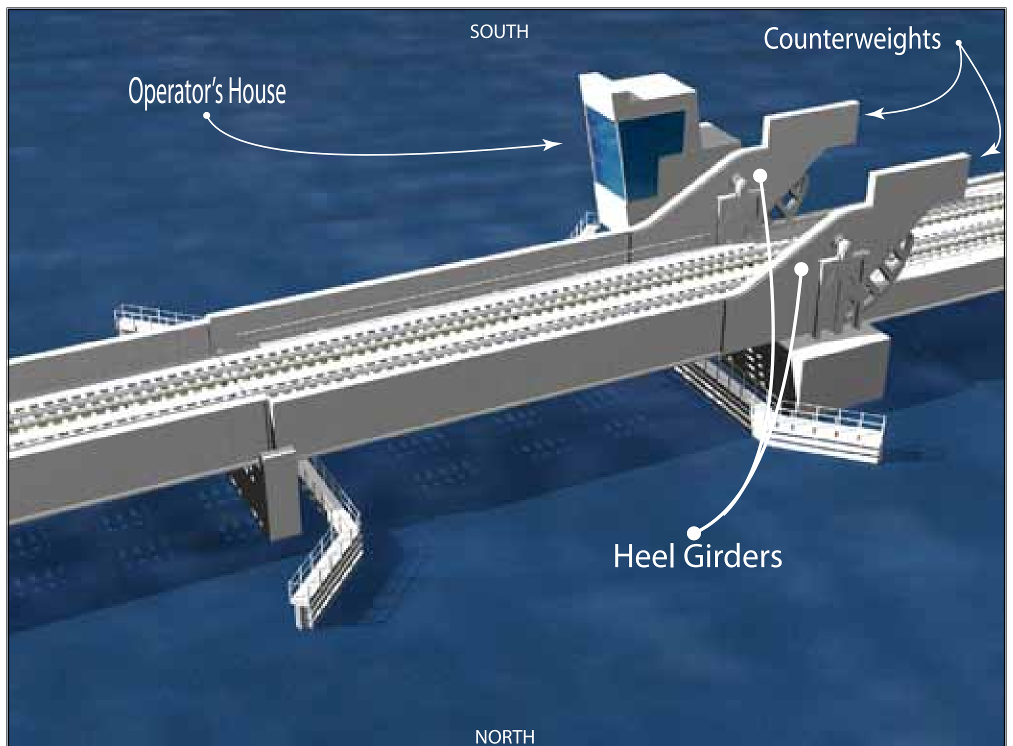
NEWS UPDATES

April 15, 2011 Volume 1 Number 4

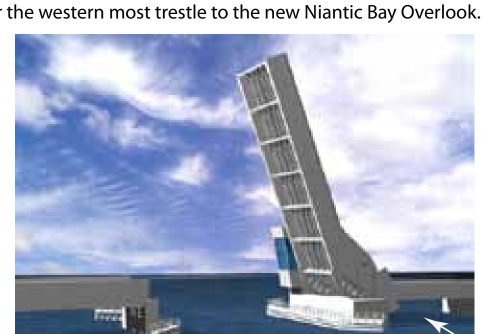
Niantic Bay Boardwalk Reconstruction Progress

Balancing the Niantic River Railroad Bridge (NAN MB 116.74)

The superstructure of the new Niantic River Railroad Bridge started taking shape on schedule and some of its pieces are already being stored on site, as seen in



This artist's rendering of the new Niantic River Rail Road Bridge is based on the actual engineered drawings from which the bridge is being constructed. Absent from the rendering are the catenary transmission wires, poles, and their supports used to transmit electricity to the trains. Also not shown is the shoreline and new pedestrian underpass that will provide access under the western most trestle to the new Niantic Bay Overlook.



the photograph above taken April 6, 2011. These six lead ingots each weighs approximately 8,500 pounds and represent a small fraction of the *Balance Plates* needed for the project.

When the bridge is completed, the lift span will require 2.6 million pounds of lead Balance Plates, 266,000 pounds of 80 pound lead *Balance Blocks,* and 25 cubic yards of heavy weight concrete (113,500 pounds) in order to balance the lift span. Once balanced, the bridges bascule lift span, depicted in its fully raised position in the lower rendering on the adjacent left, can be raised with a force of approximately 200 pounds.

In order to accomplish this balance by using counter weight adjustments, the project must include balancing and balance testing the movable span to ensure compliance with the design criteria. A partial listing of those criteria include: 1) Balance testing performed using strain gages, 2) Preparation of balance calculations prior to construction and material tests, 3) The development and documentation of the span balance procedure and methods, 4) Placing and adjusting the balance blocks, balance plates, and other balance material within the counterweight, counterweight pockets, bascule girders, rack supports, and other locations for balance material specified on the Plans. This includes fabrication, furnishing, placement, and removal of temporary balance material as required during various phases of construction. It also includes repeated readjustment of balance material as necessary until the span is balanced as specified.

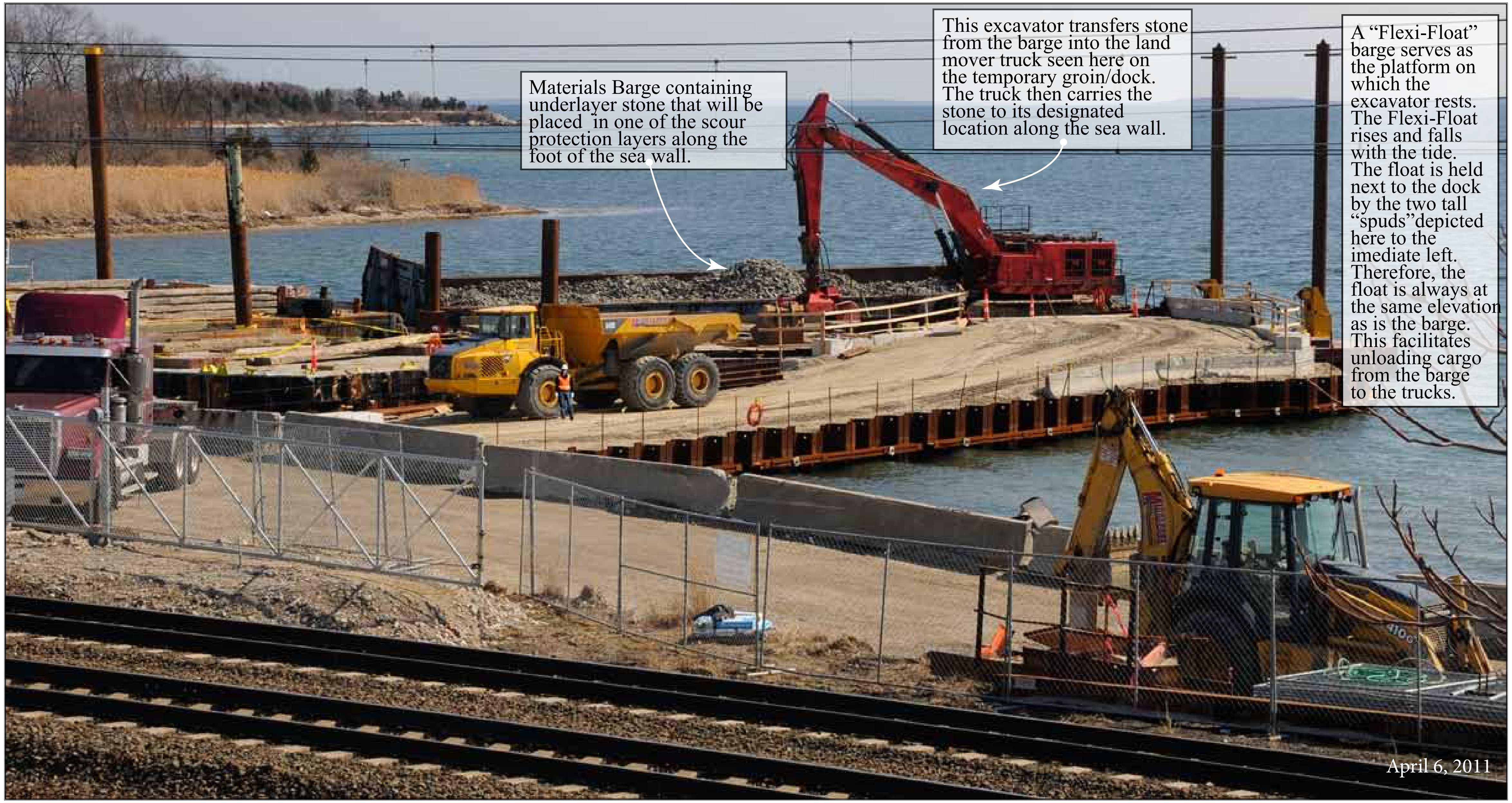
The process of floating in the girders, bolting them to the heel girders, constructing the track works, balancing the bridge, and fine-tuning the operating machinery and electrical control systems, will require a seven-day channel outage, which is currently scheduled for 2012.

The photograph below shows the south *heel girder* in fabrication at G&G Steel Company in Russellville, Alabama. The heel girders support the lift span and the counterweights. These girders are on the western end of the bridge (see the bridge rendering on the left). Each heel girder is 59 feet long. Both are depicted below. The right heel girder is lying in the center of the photograph with its track-facing side showing. The left heel girder is seen on the right portion of the photograph. Note the relative size of the girders with respect to the two welders standing on the left heel girder and the two workers by the right heel girder.

By convention, the right and left side of this bridge is determined topologically as if you were standing on the tracks looking easterly toward Boston with the operator's house on your right.

The operation depicted below illustrates half the construction process that concerns placing scour protection along the approximately 2,500 foot long sea wall that protects the railroad embankment and the Niantic Bay Boardwalk from storm damage. The scour protection requires placement of four layers of graded, angular quarry stone, which are brought by barge from the Tilcon Quarry located in North Branford, Connecticut. The stone is delivered to the work site in sequence such that the first delivery of Bedding Stone precedes the Underlayer, which precedes the Armor Layer, with precedes the final Revetment Layer of stone each weighing 6,800 pounds.

As each grade of stone arrives on barges from the quarry, they are moored in the Bay. When needed, a barge is moved in the Bay until from its mooring to the temporary dock pictured here.



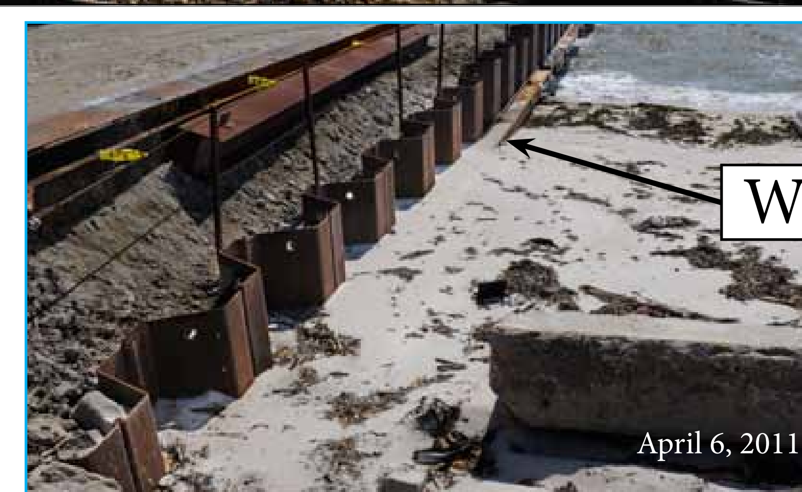
April 6, 2011

Two Volvo Articulated Hauler A40Ds, are used to carry building supplies from the dock to the work site. Each truck has a capacity of 40 cubic yards, or 30 tons. The project utilizes two such trucks in order to insure capacity to provide a steady stream of building materials delivered to the work site without interruption.

On the right is a photograph taken on April 6, 2011, 159 days after the steel sheet pile cofferdam was constructed on the west side of the temporary dock (and future site of the stone groin). This photograph shows that during the preceding 156 days, and in the absence of any significant storm events, sand has already collected against the sheet piles. Sand is collecting because the piles have interrupted the longshore drift (i.e. the gradual movement of material along a coast caused by the action of waves having a component of motion parallel to the coast). The sand will be trapped here as it inevitably moves from west to east along this stretch shoreline. That is, sand is being accreted (i.e. to grow or increase gradually, as by addition). This is of the greatest significance because it means that construction of a stone groin at this location will result in the natural accretion of a new beach that will generate a significant swimming area, new to the Overlook Park. The new beach will add an estimated 6.8 acres to the shore.

The accretion rate of sand can be estimated here because the piles support a whaler (a.k.a. a **waler** — a horizontal reinforcement utilized to keep the fill in this temporary dock from bulging outward). The waler is parallel to the horizon and a portion of the waler has become buried with new sand that has accreted since the structure was constructed on October 29, 2010. Based on the photograph below, taken on October 28, 2010, we know that the waler was positioned before the steel sheet piles were driven. Thus, the whaler served to guide the positioning of the piles. We also know that the waler was constructed above the sand . The fact that portions of the waler are now covered with sand gives us an idea of how much sand has been trapped. In fact, we know that as of April 15, 2011, 577 concrete sheet piles were sunk on the beach to construct the sea wall and that each such pile resulted in 4.74 cubic yards of sand being washed into the adjacent intertidal area by the hydraulic drilling used to place each pile. That means that 2,735 cubic yards of sand were added to the intertidal zone after the groin started to trap some, if not all, of the longshore drift that carried sand toward the waler and its sediment trap of sheet piles depicted at the lower left.

Furthermore, specifications in the environmental permits that govern the Amtrak work require that 76,000 cubic yards of beachfill sand and 400 cubic yards of beach cobbles be added to the shoreline beach during the last stages of construction in 2013. This requirement will greatly accelerate beach creation, which would otherwise be entirely dependent solely on natural accretion of sand.



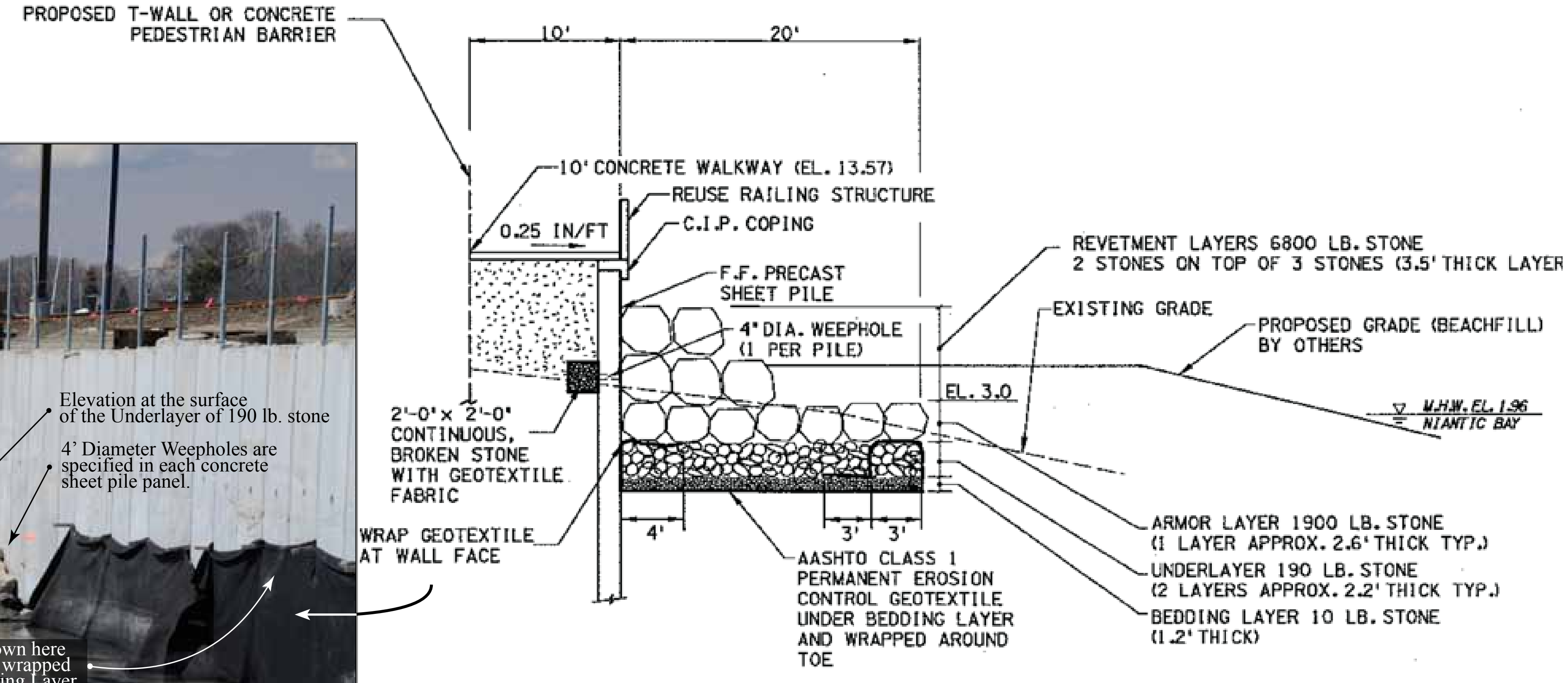
April 6, 2011


October 28, 2010

The complex process of providing scour protection to the Overlook along this stormy and exposed coast line of New England requires a construction process that is illustrated on this page. The sequence of construction activities and the quarry stone required in order to protect 2,500 feet of the newly reconstructed Niantic Bay Park, the Overlook, is specified in the steps listed above.

April 6, 2011

April 6, 2011



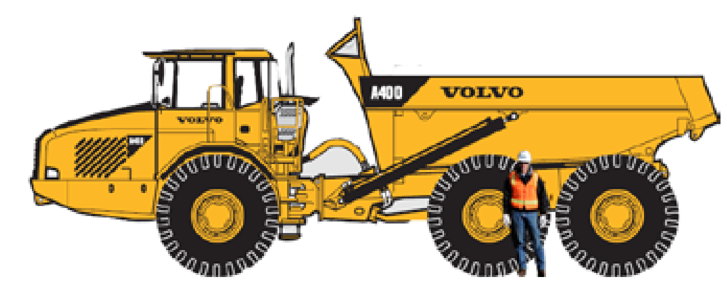
TYPICAL SCOUR PROTECTION AT WEST APPROACH WALL
STA. 71+00 TO STA. 96+29

NO SCALE

SEQUENCE (WALL SCOUR PROTECTION):

1. INSTALL PRECAST CONCRETE SHEET PILE WALL PANELS.
2. INSTALL TEMPORARY SHEETING AT BAYSIDE LIMITS OF SCOUR PROTECTION TO FACILITATE INSTALLATION OF SCOUR PROTECTION (OPTIONAL).
3. EXCAVATE TO SCOUR PROTECTION SUBGRADE LEVEL.
4. PREPARE SUBGRADE FOR PLACEMENT OF EROSION CONTROL GEOTEXTILE. INSTALL GEOTEXTILE IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS.
5. PLACE SCOUR PROTECTION SYSTEM STONE LAYERS IN ACCORDANCE WITH SPECIFICATIONS.
6. REMOVE TEMPORARY BAYSIDE SHEETING (IF USED).

The inset photograph at the left shows the placement of an Armor Layer of 1,900 pound quarry stone. Quarry stone is prepared by fracturing source material at a quarry rather than the stone being smooth, which does not interlock with one another. That is, unlike angular quarry stone, smooth stone does not resist movement to the same degree as does the quarry stone. Once the Armor Layer is installed, two final layers of 6,800 pound Revetment quarry stone will be placed according to the specifying diagram shown above.



The Volvo Articulated Hauler A40D 6X6

Seen on the left is the evolving Bascule Pier of the Amtrak railroad bridge. Concrete continues to be added in separate pours, or"lifts," to the Bascule Pier. Eventually, it will function as the base foundation that bears the full weight of approximately 3,200 tons when the bascule lift span is raised to allow passage of river boat traffic too high to pass under the closed bridge. The bridge will be opened approximately 4,000 times a year.

The photograph below is looking west from a point approximately 300 feet west of the Niantic River shore line. It shows the new Overlook sea wall on the left curving away for a distance of approximately 2,500 feet toward the Hole in the Wall underpass. The 10 foot wide walkway will be constructed of concrete along the full length of the sea wall. A concrete retaining wall will be constructed parallel to the walkway and will serve to retain fill on which the new rail bed will be placed. The retaining wall at this location will be approximately 20 feet high and, will taper down as one moves west and the track slowly return to their elevation now present at the Hole in the Wall.

When the new bridge is fully ooperational, the rail on which the approaching train will run, will be shifted from the existing alignment to one which will be shifted about 56 feet seaward to cross the new Niantic River Railroad bridge. After all work is completed, and the tracks and switches are tested and certified, the rail traffic on the present rails will be switchrd to the new allignment.

The granite blocks below will be attached to the face of the Bascule Pier by stainless steel anchors that are encased in the various levels of concrete. One such anchor is shown lying on top of the blocks. The purpose of the blocks is to armor and thus protect the exposed surfaces of the pier from ice damage or collisions by river traffic.