East Lyme Public Trust Foundation, Inc.

News Updates

June 5, 2012 http://publictrustfoundation.org/news.htm Volume 2 Number 1

Niantic Bay Boardwalk Reconstruction Progress

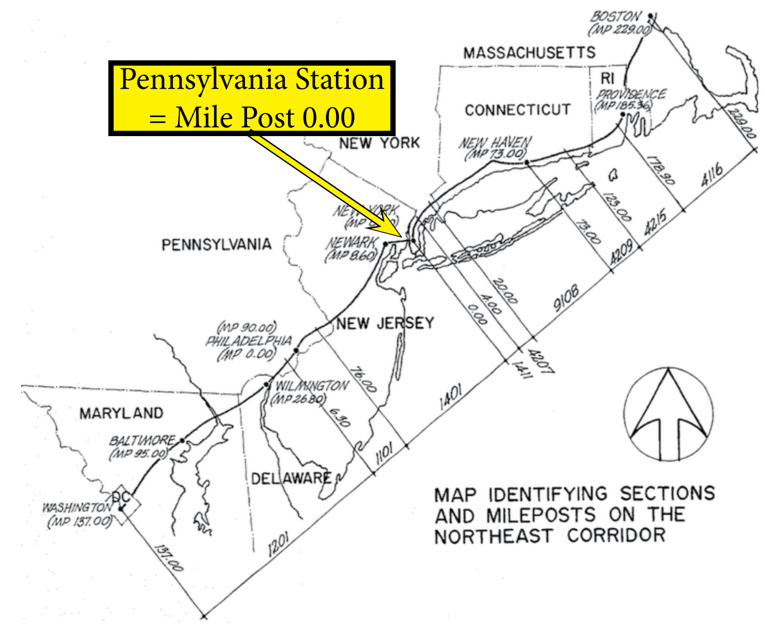
The earliest record of a crossing at the mouth of the Niantic River dates from 1660, when John Winthrop of New London was authorized to operate a ferry across the river. The first roadway bridge to span at, or near, this site was a toll bridge built by the Niantic Bridge Company in 1796. Almost a century later, the first railway bridge was constructed when the Shore Line Railway was built between New Haven and New London in 1852. In 1891, shortly after consolidation of this rail line into the New York, New Haven & Hartford Railroad system, this railway bridge was replaced with a swing bridge. The present rolling-lift bridge was built in 1907, when the New York, New Haven & Hartford Railroad was making substantial improvements throughout the system, in order to permit the use of heavier and faster trains. Many of these improvements pertained to bridges.

The present bridge replacement project will cost Amtrak a total of $155 million (±1.5 million) for all aspects of the replacement of its Niantic River railroad bridge. Within that total budget, the cost of its replacement of the Niantic Bay Overlook Park walkway (2,515 feet) is $2,093,000. This cost does not include the sheet pile walls, which are considered embankment retainage. An additional major cost for Park improvement is $1,880,000 for the design and construction of the stone groin at the eastern end of the Park. The groin is an essential part of the park because it will create and stabilize an estimated 8 acres of new beach that will add to the Park's use and its public trust value.

Enhancement to the beach along the replaced and improved walkway included the addition of 76,000 cubic yards of sand at a total cost of $2,584,000.

Niantic River Railroad Bridge (NAN)
Milepost 116.74

The Niantic River Railroad Bridge, which Amtrak refers to as "NAN," is located at Milepost (MP) 116.74 based on its distance along the track relative to a reference point designated as MP 0.00. That point is Pennsylvania Station in New York City, which is the MP reference point used to position structures along the Northeast Corridor that stretches between Washington, D.C. and Boston Massachusetts. The Corridor stretches 456 miles as illustrated on the accompanying map above.

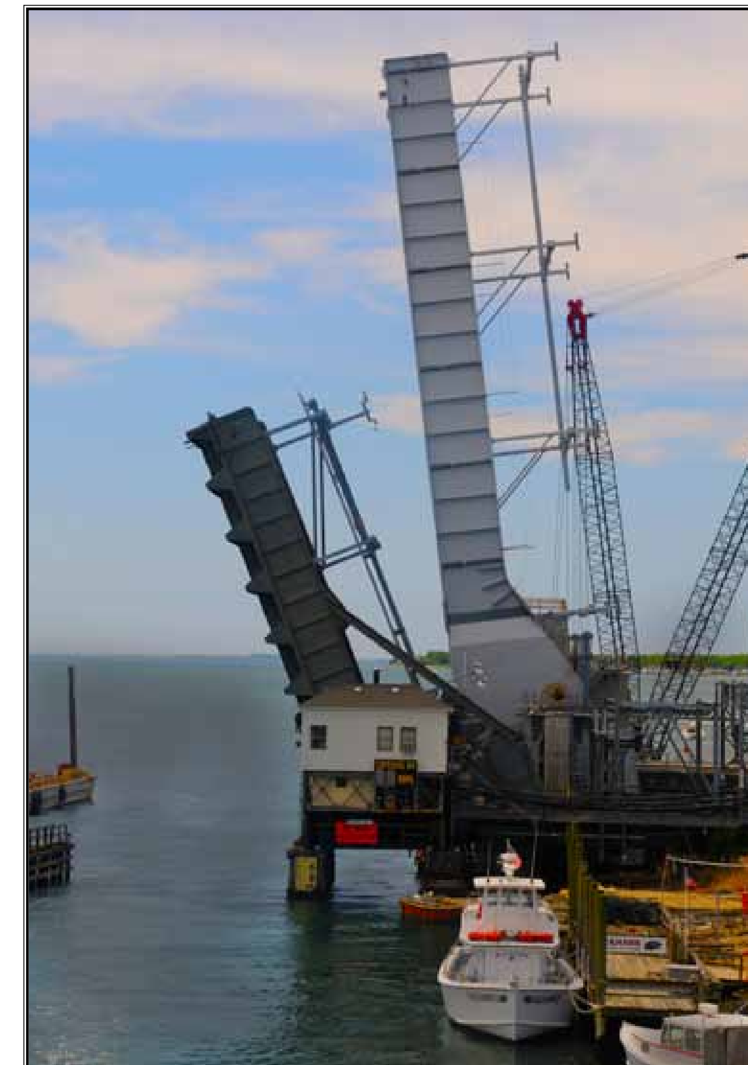


NAN was determined to be eligible for listing on the Federal Registry of Historic Places based on investigations published in 1979 and 2002. Those studies examined the bridge replacement project area within 500 feet of NAN and they concluded that the only historic or archeological resources in that project area are the existing bridge and its appurtenances, as well as the piers remaining from an earlier, adjacent 1891 swing bridge. The only identified archeological sites are outside the project site.

The existing bridge is a through-girder, Scherzer rolling-lift bascule bridge with overhead counterweights operated by a chain-driven mechanism. Built in 1907, the present bridge replaced that earlier swing span built in 1891 that was located on an alignment approximately 44 feet south of the present bridge. In the closed position, the existing bridge provides 11.5 feet of vertical clearance and 45 feet of horizontal clearance at Mean High Water. There was a wood fender system that protected Bridge Pier 3 along the east side of the channel.

The 1891 bridge was itself a replacement of an earlier railroad bridge located on an alignment approximately 165 feet north of the present bridge. All that remained of the 1891 bridge was the central turntable pier, the two stone masonry abutments for the former swing bridge, and four fixed approach span piers adjacent to the site. A fifth 1891 pier, located at the west side of the navigational channel, was no longer present. The 1891 bridge was a cast iron Pratt through-truss, which superstructure was removed at the time the present rolling-lift bridge was completed in 1907.

In August 1977, FRA initiated a determination of the Niantic River Bridge's eligibility for inclusion in the National Register of Historic Places. In a letter to the National Park Service, the Connecticut State Historic Preservation Officer concurred that the present Niantic River Bridge was eligible for inclusion in the National



Taken on May 20. 2012, from the Route 156 highway bridge, the 1907 span is 45 feet long and the new span is 138 feet long.

Register. A formal determination of eligibility was then completed on December 6, 1977, making all work on the bridge subject to the provisions of Section 106 of the National Historic Preservation Act of 1966 and of Executive Order 11593..

Before reconstruction of the bridge became possible, there was an effort to upgrade the safety rating of the fixed spans of the bridge to good condition and the movable span to fair. Severely corroded members of the steel superstructure were repaired and reinforced in 1978. As part of a more comprehensive program in the early 1980s, the bridge was further repaired, reinforced, and selectively rehabilitated. This work included structural repairs to the bridge piers, stiffening of the bridge deck and lift section, and changes to the operation of the lift mechanism, signaling, and other safety systems. It was at this time that the original (1907) Saxby and Farmer dwarf signals were removed from between the tracks. All **Armstrong levers**[1] were also removed from the operator's house, and all equipment was converted to electromechanical operation, resulting in a loss of historical integrity of the resource.

In conjunction with the mid-1980s structural and mechanical repairs to the bridge, the operator's house was modified. In addition to upgrading the operating systems in the operator's house, the work included insulating the walls, floor, and ceiling of the structure, installing new roof shingles and six roof vents for the attic space, replacing the windows and doors, installing horizontal vinyl trim and vertical vinyl siding over locking, and plywood installed over the original sheathing after the removal of the original siding.

As part of the electrification of the Northeast Corridor between New Haven and Boston in the late 1990s, movable or retractable catenary sections were designed and installed on all the movable bridges along the Corridor. Between 1997 and 1999, engineers designed and constructed a system whereby the main catenary of the Niantic River Railroad Bridge terminates at a lattice steel termination structure at the west abutment and at the third pier of the bridge. This configuration leaves the most westerly fixed span and the adjacent operable portion of the bridge to be energized by a movable frame structure that rides on top of rails set outside and parallel to the bridge girders of the stationary span. This movable unit retracts the conductor beam structure from within the movable portion of the bridge, thereby allowing the counterweight to descend without interfering with the energized catenary.

An archaeological reconnaissance survey was conducted in the project area in conjunction with the 1979 Final Environmental Impact Statement. The Niantic River/ Niantic Bay area is generally regarded as a sensitive archaeological area containing six known prehistoric sites identified on both sides of the river in the area approximately one mile north of the Bar and bridge site. The survey of the site west of the bridge along the Bar contains extensive disruption and modification due to railroad right-of-way improvements over the last century. The investigating archaeologist also noted that east of the bridge, nearly all of the right-of-way has been extensively filled or graded, leaving little chance of finding any undisturbed archaeological sites.

Subsequent to the 1978 survey, a seventh site was located approximately 1,000 feet south of the present bridge on the east bank of the river.

These findings in the late 1970s, coupled with additional information provided by the East Lyme Historical Society and the Connecticut Historical Commission, confirm that there are no non-railroad-related sites of historic significance within 500 feet of the project area.
The principal findings of the above historical/ archaeological evaluations are illustrated in the map at the right, which is based on data taken from the Final Environmental Impact Statement and 4(f) Statement for replacement of the Niantic River Bridge and its approaches as published in 1979 by the Federal Railroad Administration.

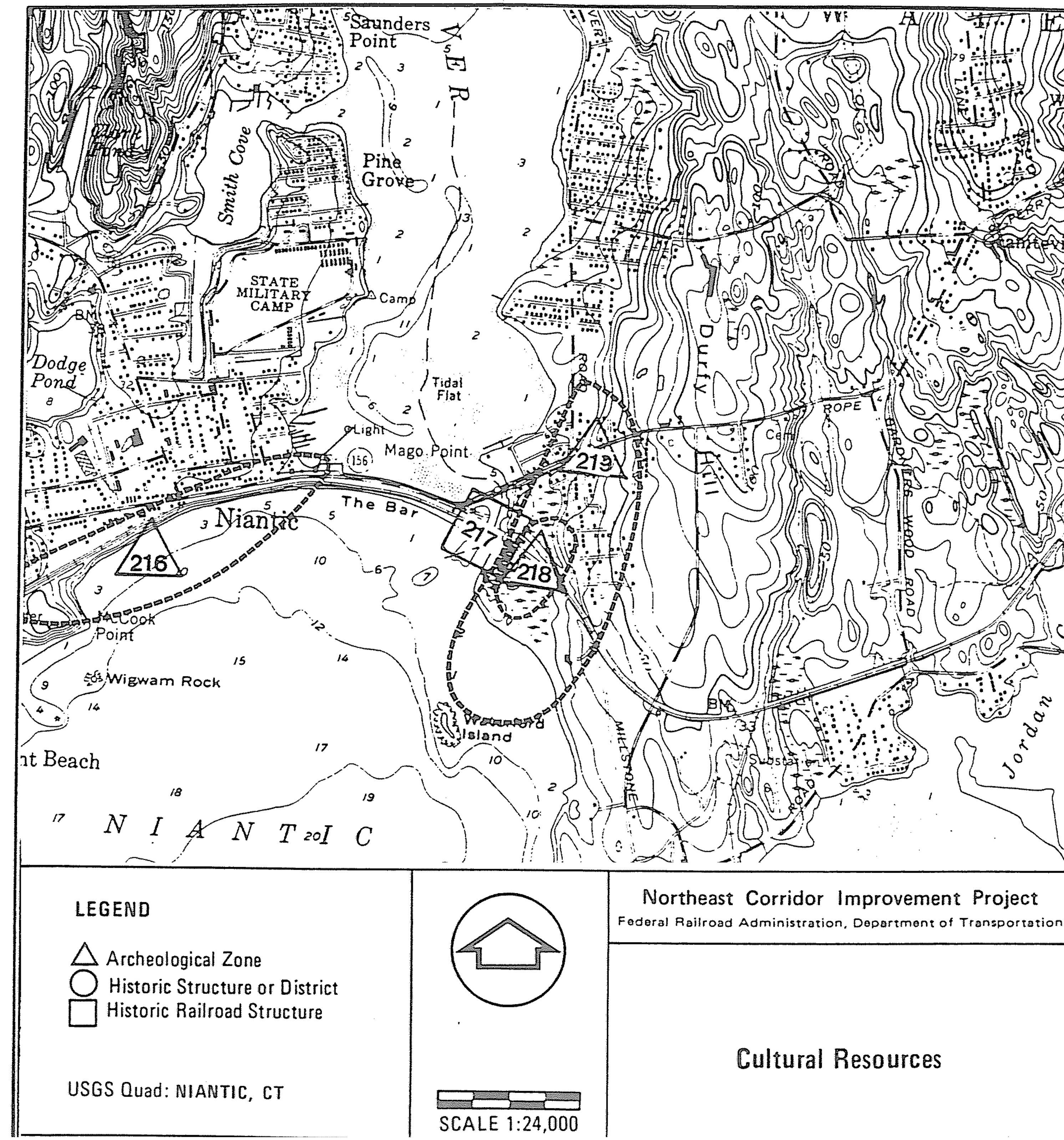
Findings illustrated on the map at the right include:

216. Prehistoric archeological zone (#83). An area potentially sensitive to prehistoric occupation due to location along Niantic Bay where clam and oyster beds are most prevalent. The Niantic River is also a spawning area for sea trout and was once plentifully supplied with scallop beds which were utilized by prehistoric occupants of the area.

217. Niantic River Bridge, 116.74. A through girder chain-driven Scherzer rolling lift bascule span with overhead counterweights. It was built in 1907 replacing a swing span bridge built in 1891 on a parallel alignment about 49 feet to the south. (Determined eligible for the National Register.)

218. Historic archeological zone (#82). Documentation indicates that this area is the site of a very early original settlement and a mid-19th century rope ferry bridge.

219. Prehistoric archeological zone (#81). On the east bank of the Niantic River has been found a stray find, burial and shell middens, all of which have been documented. These observations and reports confirm that the proposed bridge replacement would not affect significant cultural



1. **Armstrong levers** -- The railroad tower (or cabin as some railroads called them) housed an interlocking machine that was controlled by an operator or leverman. The operator would pull various levers, which in turn would align switches and signals through a series of trackside pipes. These levers were often referred to as "**Armstrong**" levers because you had to have a strong arm in order to operate the machine. The pipes could be up to a mile in length!

resources and, therefore, it was concluded that the proposed bridge replacement would not affect significant cultural resources.

The above aerial photograph was taken on December 26, 2011. It shows the relationships between the existing railroad and the magnitude of the shift of tracks 58 feet south

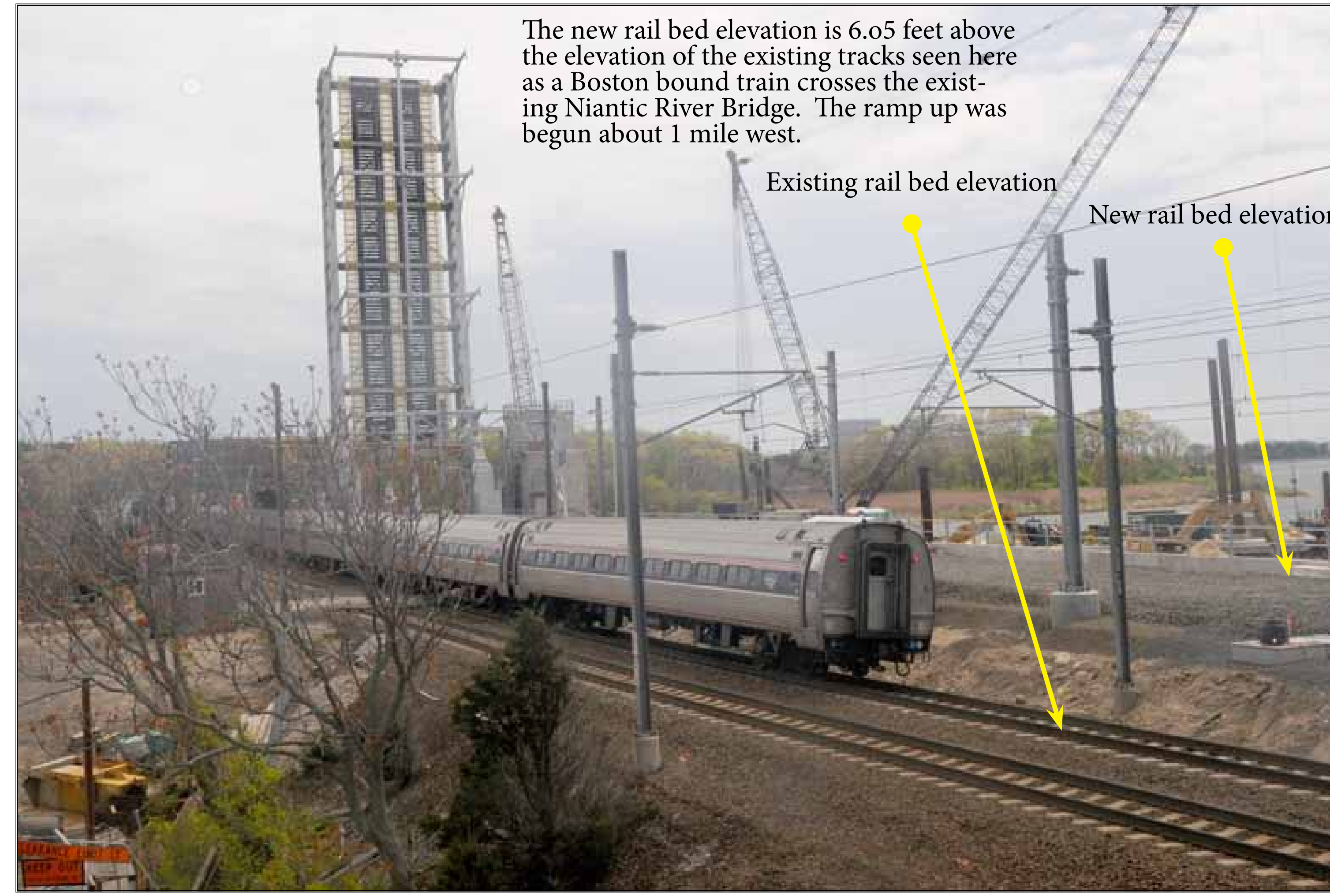
that is required for them to carry trains over the replacement bridge, which is being constructed immediately to the south of the existing bridge. Once train traffic is running over the new bridge, the old bridge will be removed.

SUMMARY OF WORK ON THE NEW BRIDGE

The work consists of construction of a two track, railroad bascule bridge across the Niantic River, near East Lyme and Waterford Towns, New London County, Connecticut. The proposed railroad bridge will replace an existing, two track, bascule (rolling lift) bridge, 58 feet off-line at the same site, and will include construction of new approach fills, both retained and in embankments, and new electrified railroad. The Town of East Lyme's Niantic Bay Overlook Walkway ("Boardwalk") will be replaced, and the Beach will be replenished.

This proposed bridge replacement project, in summary, entails the following (A fuller summary description is contained in Section 01100 of the Project Specifications):

A. BRIDGE. A new, two-track, three span railroad bridge is under construction off-line[2], 58 feet south of the existing railroad alignment. Once the proposed bridge is constructed and operational, the new tracks will be put

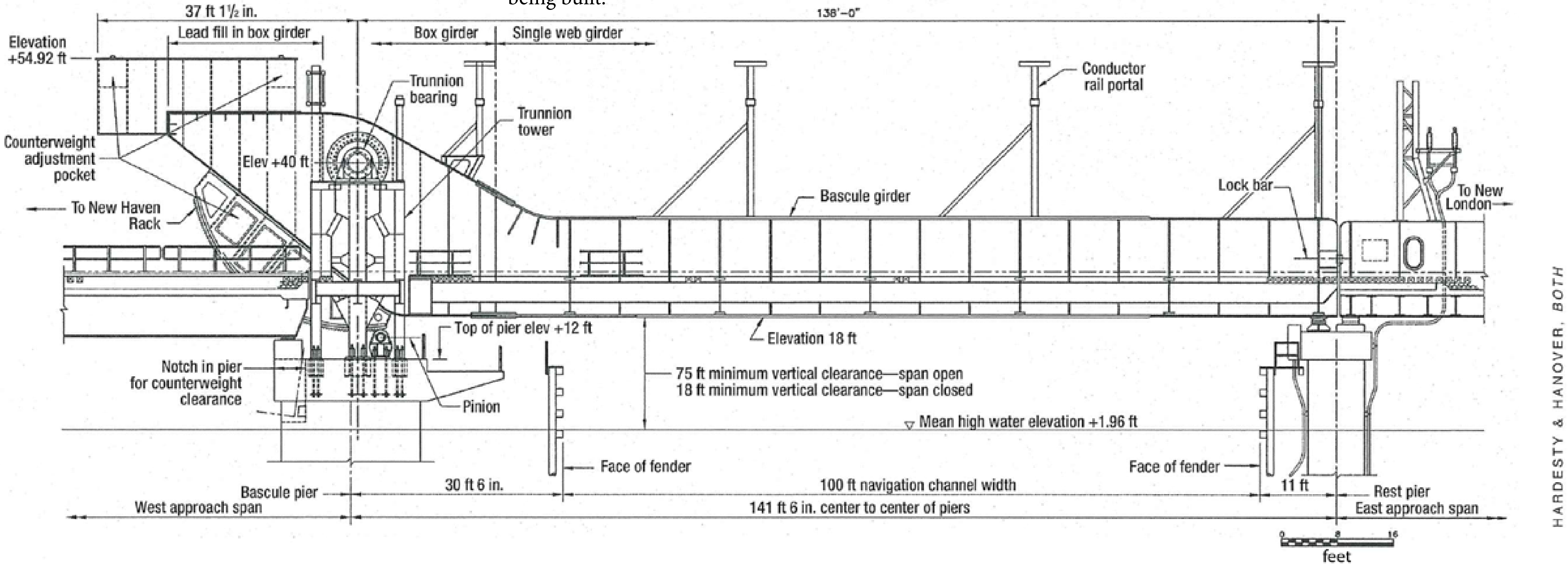


into service, the old tracks will be taken out of service, and the existing (i.e. old) bridge will then be removed.

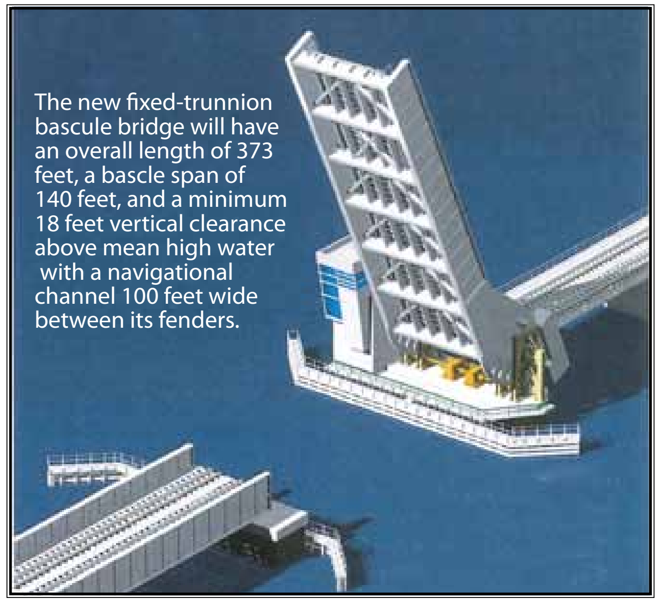
NAVIGATION CLEARANCES.

1) Existing bascule bridge
   a) 45 feet horizontal clearance
   b) 11.5 feet of vertical underclearance to MHW in the bridge closed position
   c) unlimited vertical clearance in the bridge open position

2) New replacement bascule bridge
   a) 100 feet horizontal clearance between proposed fenders. The proposed 100-foot wide channel will match the present US Army Corps of Engineers (US ACE) Navigation Channel Project width of 100-feet, both upstream and down stream of the bridge.
   b) 16 feet of vertical underclearance to MHW in the bridge closed position
   c) Vertical clearance in the open position



2. **Off-line construction.** The new tracks are constructed separate from, and parallel to, the existing tracks that continue to carry train traffic while the new tracks are being built.



of 75 feet at the most restricted edge of the channel (for most of the proposed 100-foot channel, the clearance will be unlimited).

3) During construction, existing navigation clearances will be maintained at all times, except for brief periods of one week when the prefabricated bascule span, assembled on a barge, was floated on the river and connected to complete the new span crossing. An additional and separate, three-day closure period is needed for removal and float-out of the existing bascule span during demolition. Each of these periods are restricted to occur within the navigation slack time, between November 1st and April 15th. Additional channel restrictions to accommodate the contractor's proposed operations during construction will be required upon request of the contractor, and as approved/permitted by the US Coast Guard.

B. APPROACHES. In order to build the new three-span railroad 58 feet south of the existing railroad, track along both the West and East Approaches to the bridge, must be realigned.

1. The West Approach work will entail track and railroad electrification construction, retaining wall construction, soil consolidation, scour protection and construction of a cast-in-place concrete walkway to replace the pre-existing elevated timber boardwalk constructed in 2004.

2. The East Approach work in Waterford will also entail track and railroad electrification construction, embankment installation, scour protection, and retaining walls.

C. WALKWAY. Half of the existing Niantic Bay Overlook will be relocated due to the new track alignment on the west approach. As required by the federal and state environmental permits that Amtrak was required to obtain, specifies that the Federal Railroad Administration "... and Amtrak will comply with the Connecticut Department of Environmental Protection's request for in-kind or better replacement of any impacted Boardwalk components." Based on that requirement, the original wooden boardwalk was removed and is being replaced by a 10-foot wide concrete walkway as illustrated below.

The walkway is being incorporated for its entire 2,515 foot length in to the protection of the outer cantilever retaining wall and scour protection designed to protect the railroad against the potential damage of storms with 100 year frequencies, or less. At the east end of the walkway, a concrete ramp will connect to a new 10-foot sidewalk, which will go around the west bridge abutment, under that bridge, and connect to the existing parking area at Cini Park. Portions of Cini Park will be closed during construction and available for use by the contractor. After construction, Cini Park will be restored for public use.

D. BEACH REPLENISHMENT. Beach Replenishment is required by specifications in the state and federal environmental permits that include construction of a 230 foot long rock groin/fishing pier with a precast concrete sheet piling core in Niantic Bay west of the mouth of the Niantic River. In conjunction with construction of the groin, the environmental specifications require that the

The aerial photograph to the right was taken on April 25, 2012 at 11:22 am when the tide was estimated rising indicated below on the NOAA tidal graph at New London, which is 52 minutes behind the tidal cycle recorded at the Niantic River Railroad Bridge.

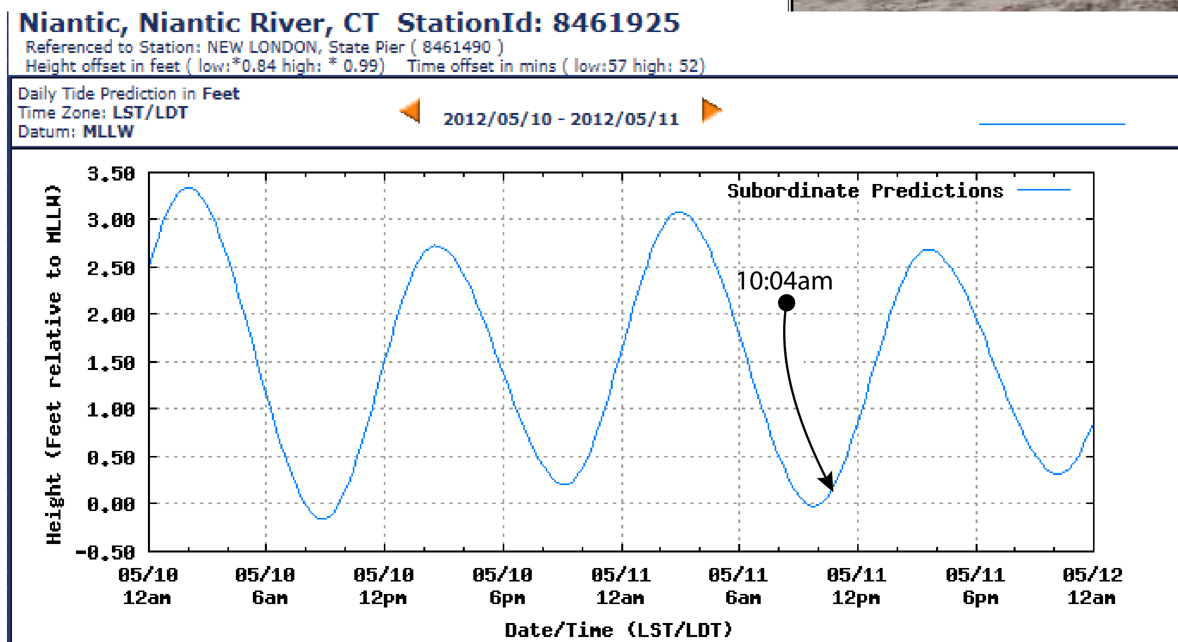
The photograph below was taken on May 11, 2012, and is a west view of the new Overlook walkway, which is 10 feet wide and 2,215 feet long. The fencing seen here is recycled from the original boardwalk, which was also used to replace the wooden fencing along the existing wood walkway along the north side of Route 156.

existing beach along the eastern half of the Park walkway be "nourished" (i.e. replenished or augmented) by placing more than 76,000 cubic yards of native and imported sand, including 600 cubic yards of cobbles stockpiled from the original beach. By placing this sand and stone on the new beach, it will be given a substantial jump-start, which will be augmented by natural accretion. The beach will increase and stabilize its width until no more sand can be trapped on the west side of the groin. It is estimated that the new beach will ultimately provide approximately 8 acres of new recreational area.

Relative to the photograph at the lower right, it shows the beach as of May 11, 2012, at 10:04 am LDT, when the tide was slightly above low, as indicated in the National Oceanic and Atmospheric Administration tidal graph above the photograph. Of particular note in this photograph is the 13 inch bench that was created by the tidal erosion of the placed sand. It is significant because it indicates that the elevation of the placed sand is being readjusted, as was anticipated, by the tides and storm waves. That eroded sand is being swept into the tidal zone and is thus carried out into the bay and is tending to drift in an easterly direction toward the groin. Some of the sand will be carried far enough off shore and away from the beach such that that sand will be lost to the beach. It will thus escape being trapped by the groin and it will be carried by the currents toward Millstone Point, or it will be carried up stream and be deposited in the channel or on the flats north of the Bar.

Preventing, or at least reducing, the loss of some of the 76,000 cubic yards of sand that was spread over the new beach to give it a jump-start in its growth and stabilization could be affected by regrading the beach from the bench that is being created by the tides and storm waves as they erode and redistribute the sand.

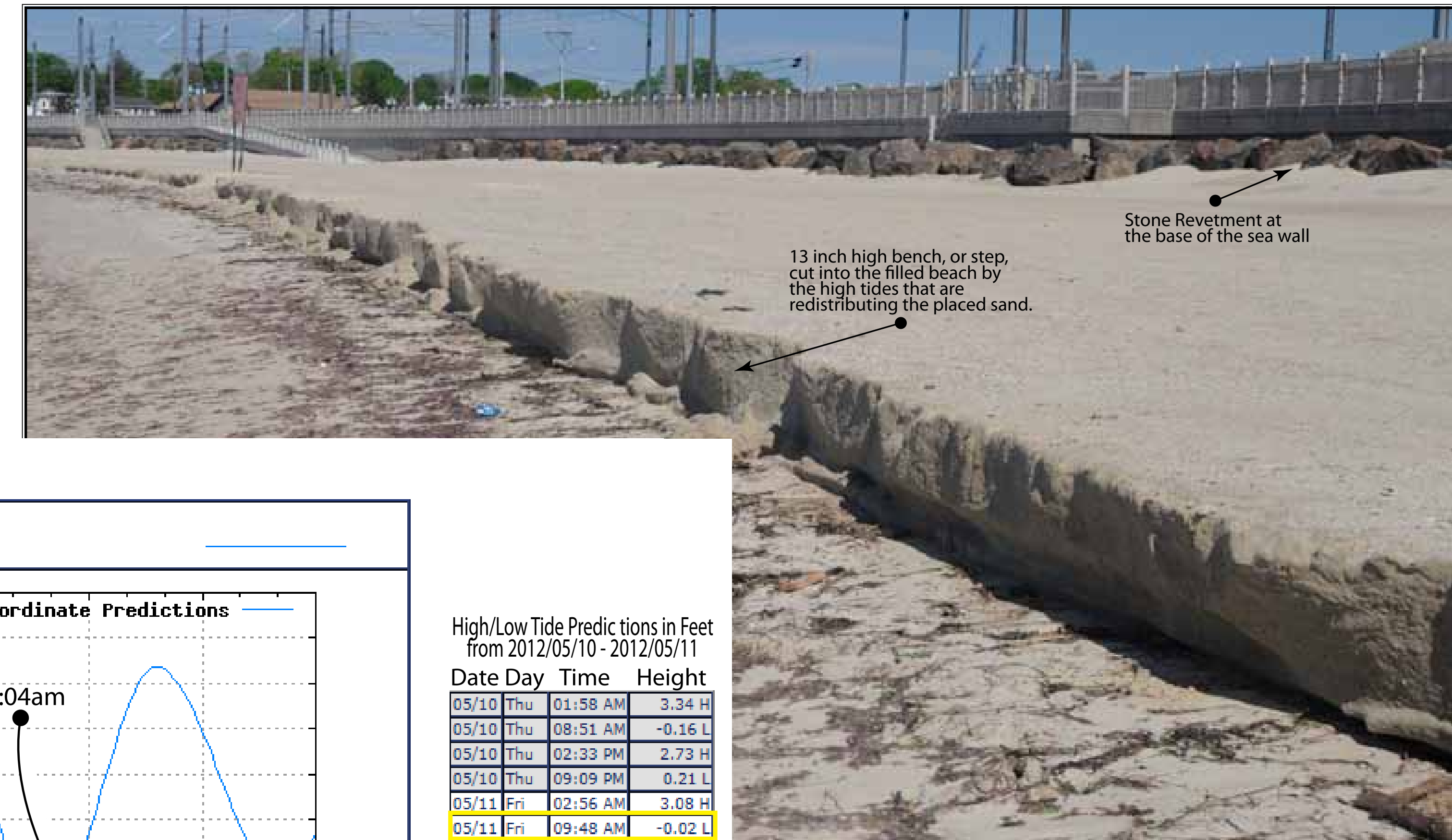
The photograph on the upper right was taken on May 11, 2012, at 9:42 am. The bench seen here is approximately 13 inches high and runs parallel to the shore a distance of approximately 2,200 feet. On May 11th, the bench was 88 feet seaward of the stone revetment along the sea wall seen in the background, which means that were the sand between the bench and the revetment regraded at the natural angle of repose of the beach, there would be approximately 15,500 cubic yards of sand that could be moved to the upper elevation of the beach. Were that sand divided there into man-made sand dunes, planted with dune grass [i.e. American beach grass *(Ammophila breviligulata),* and seabeach sandwort (*Honkenya peploides*)], two important goals would be reached. The first would be to provide an appropriate new habitat for dune grass and seabeach sandworth. The second, and of greater importance to the public trust would be that these man-made sand dunes at the top of the beach would serve in the natural process of beach sand replenishment. Future storm events would otherwise erode the lower beach and alter its angle of repose. That negative impact would occur in the absence of a supply of sand sources from the upper beach.



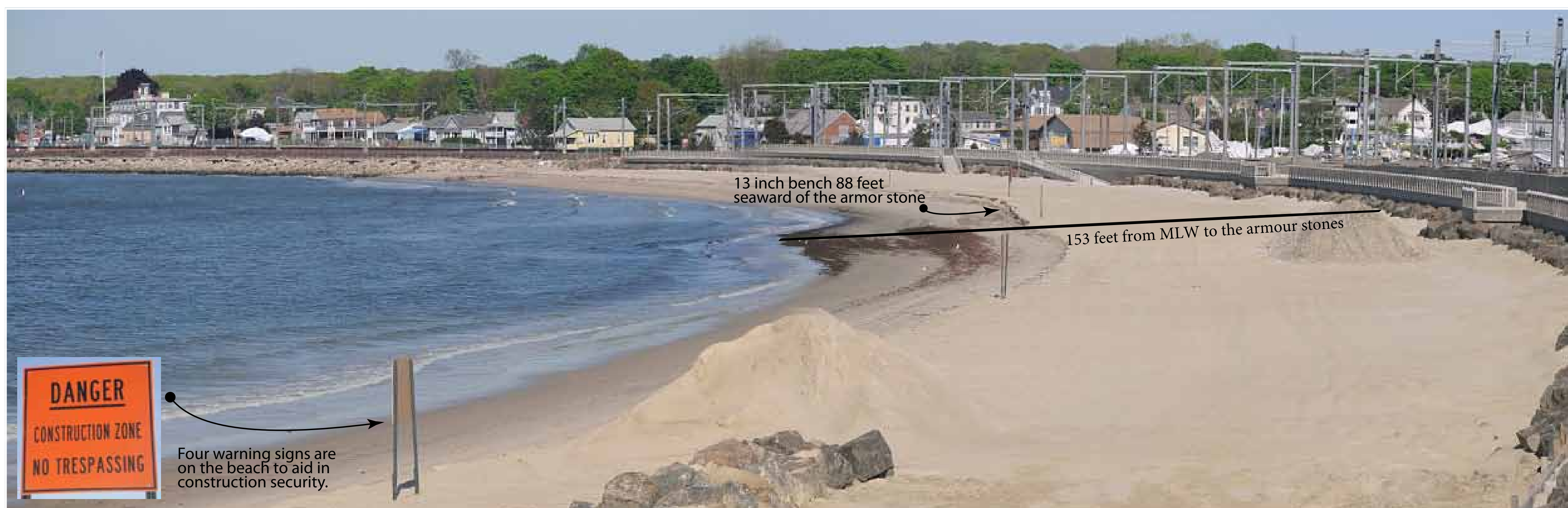
Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.
Note: For predictions of Subordinate stations, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.

High/Low Tide Predic tions in Feet
from 2012/05/10 - 2012/05/11

Date	Day	Time	Height
05/10	Thu	01:58 AM	3.34 H
05/10	Thu	08:51 AM	-0.16 L
05/10	Thu	02:33 PM	2.73 H
05/10	Thu	09:09 PM	0.21 L
05/11	Fri	02:56 AM	3.08 H
05/11	Fri	09:48 AM	-0.02 L
05/11	Fri	03:34 PM	2.69 H
05/11	Fri	10:14 PM	0.31 L



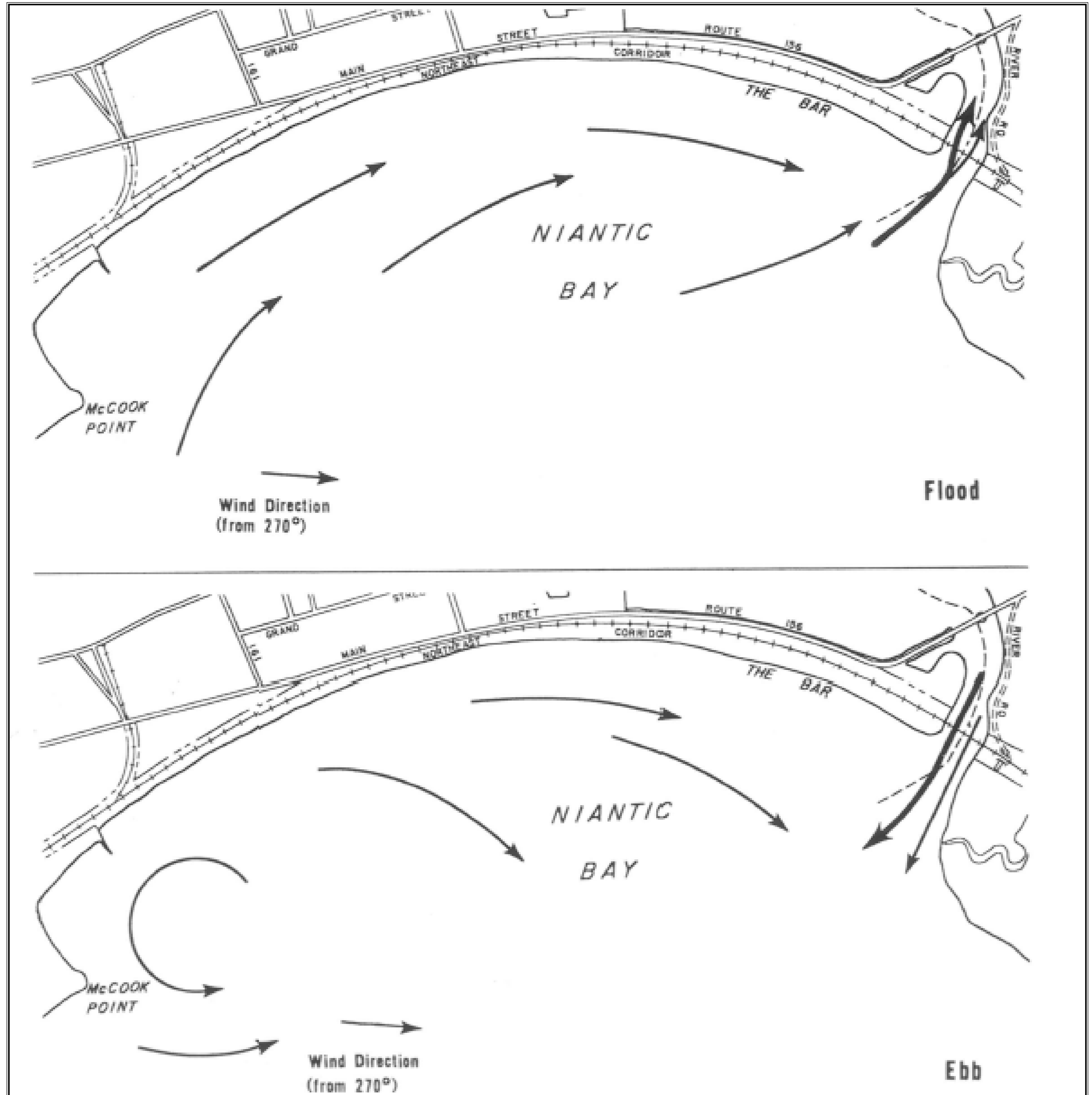
Although some of the placed sand that is being eroded by the tides, as illustrated in this photograph, will contribute to the growing beach sand trapped by the Terminal Groin, its highest value is as a source of material if it is graded in to man-made dunes at the top of the beach. From there, this "stored" sand would be naturally distributed to "feed" the beach when future storm erosion impacts the park.



The cross section shown on the following page represents the beach profile upon completion of the placement and grading of 76,000 cubic yards of sand that was excavated in Coventry, Connecticut and delivered by truck to the beach in Niantic. The evolving configuration of the beach will continue due to natural factors that include: 1) tidal circulation in Niantic Bay and the resulting transport of sediments (i.e. sand) from the beach and from other sources, and 2) storms that deposit or erode the beach.

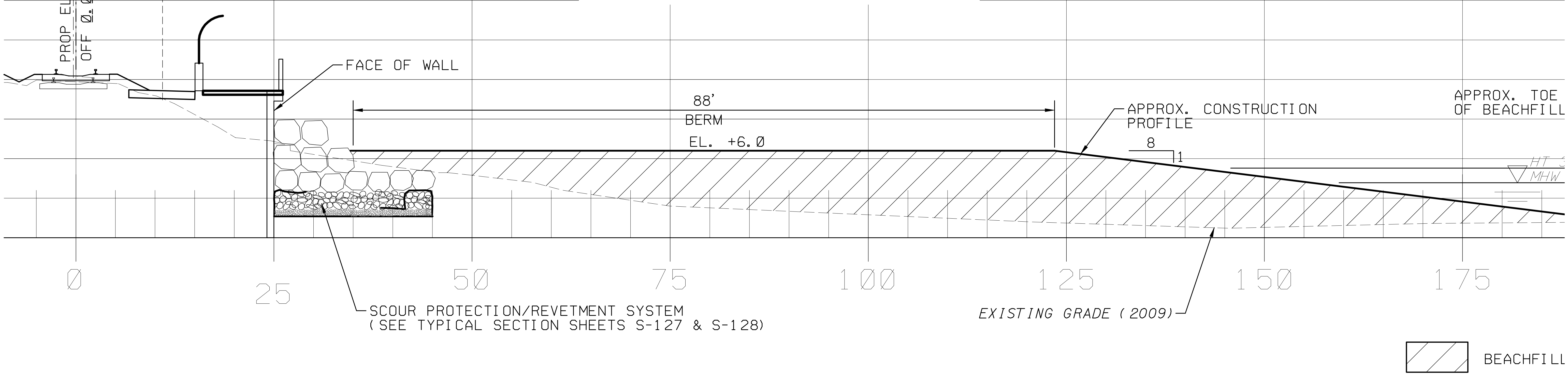
The cross section at Station 71+00 shows the characteristics of the newly enhanced beach using this Station as typical for the whole beach. It lies at approximately the longitude of the Niantic River Transmission garage on Route 156, near the railroad Mile Post 116, marked on a five foot white pillar adjacent to the tracks and visible as one drives east on Route 156. This project station is the beginning of the Amtrak reconstruction project. The Terminal Groin is 2,400 feet east of Station 71+00 and marks the end of the beach at approximately construction Station 95+00.

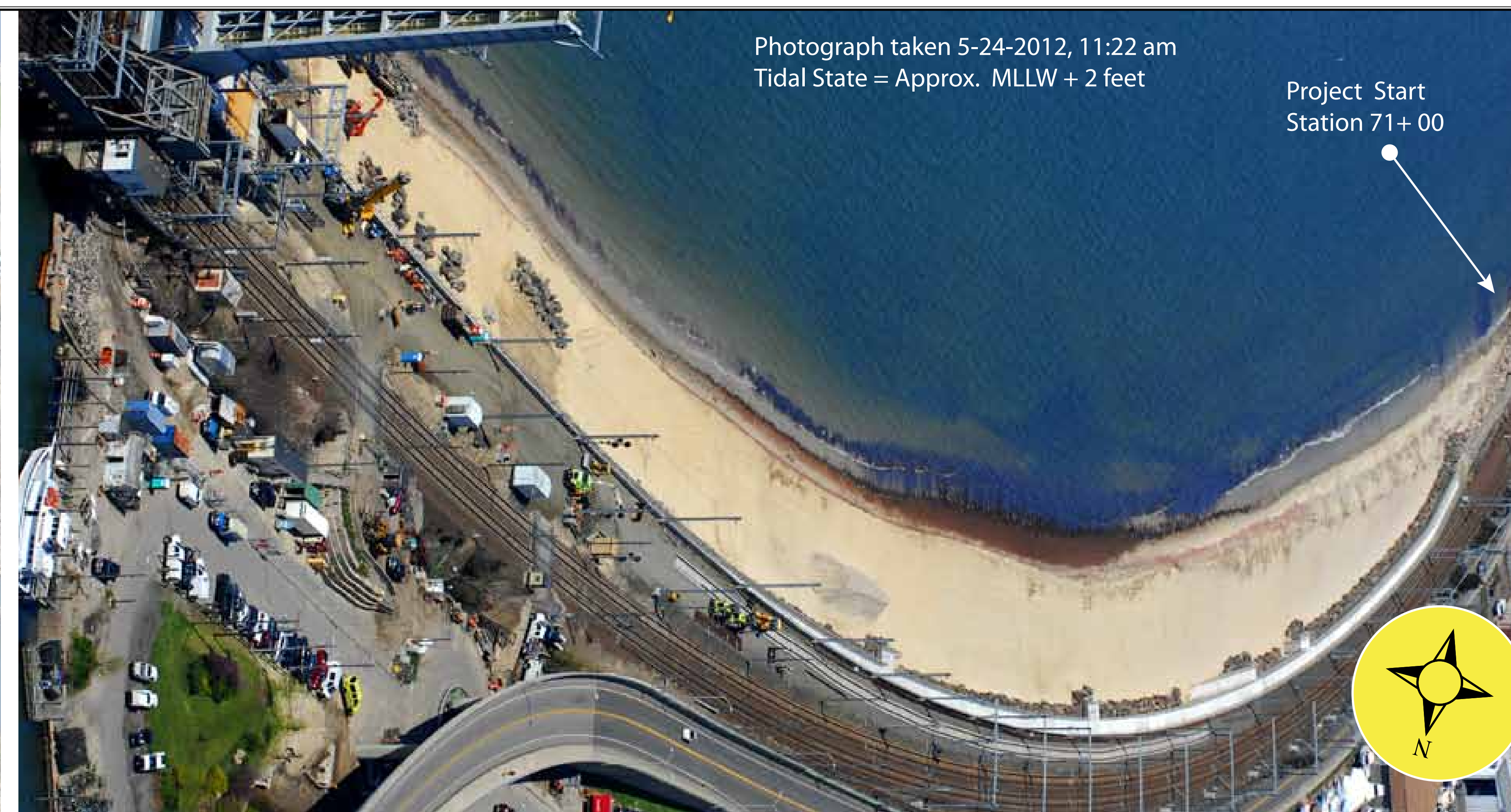
"Long Shore Currents" of Niantic Bay are responsible for the creation and growth, and the erosion, of its beaches. They are depicted in the figure at the right that was taken from the Final Environmental Impact Statement and 4(f) Statement prepared for the Federal Railroad Administration in 1979. That assessment included field studies that measured Long Shore Currents depicted on this figure. It shows that the currents tend to move sediments from west to east during both ebb and flood tides. The consequence of that circulation is to move deposits along the beach from west to east, which explains the natural accumulation of sand on the east side of the groin built by East Lime in the 1970s which subsequently soon trapped the sand that created the Hole in the Wall Beach.. This Long Shore Currents, or Drift, phenomenon also explains why the new beach will grow until its Terminal Groin (see Page 7) can trap no more sand. The extent of beach formation is defined further elsewhere and is illustrated in Volume 1 Number 3 of these News & Updates publications at: http://www.publictrustfoundation.org/.



Typical Beachfill Construction Profile

(Station 71+00 to Terminal Groin)





Prepared and Printed by:
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