



Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Richard A. Davey, Secretary & CEO
Frank DePaola, Administrator



December 18, 2012

Robert Boeri
Project Review Coordinator
Massachusetts Office of Coastal Zone Management
251 Causeway Street, Suite 800
Boston, MA 02114

**RE: Federal Coastal Zone Consistency Review
Bridge Street over Mitchell River Bridge Replacement Project
Chatham, MA**

Dear Mr. Boeri,

The Massachusetts Department of Transportation - Highway Division (MassDOT) is submitting this Federal Consistency Review application and Consistency Certification for the replacement of the existing Bridge Street drawbridge over the Mitchell River in the Town of Chatham. As this project is located within the Coastal Zone, is receiving federal funding and requires federal permits, the project is subject to the Massachusetts Coastal Zone Management (CZM) Program Federal Consistency Review Regulations (301 CMR 21.00).

The existing Mitchell River Bridge is structurally deficient and is beyond repair, and consequently replacement is the chosen alternative. The existing wooden drawbridge will be replaced with a bridge founded on a stone-clad, concrete bascule pier and concrete-filled driven steel pipe piles. Woden elements will be incorporated into the superstructure, including a timber wearing surface, timber railings, and with exception of the bascule pier, wooden stringers.

The attached project narrative includes a project description, a listing of specific CZM program policies relevant to the project and an analysis and description of how the project is consistent with these policies effective as of October 4, 2011. Along with this application, MassDOT has concurrently submitted the following permit applications and consultation documents: Water Quality Certification application with the MA Department of Environmental Protection; MA General Permit Category II Application with the U.S. Army Corps of Engineers; Section 7 determination with the National Marine Fisheries Service; and revised bridge plans with the U.S. Coast Guard to supplement the Bridge Permit application submitted on July 9, 2012.

The proposed activity complies with the enforceable program policies of the Massachusetts coastal zone management program and will be conducted in a manner consistent with such policies.

If you have any questions, or require additional information, please call me, Timothy Dexter, MassDOT at (857) 368-8794.

Sincerely,

Timothy Dexter
Environmental Analyst
MassDOT Highway Division

cc: Christopher Bisignano, U.S. Coast Guard
Damaris Santiago, FHWA

Enclosures: CZM Consistency Review Narrative, Figures, and Plans.

Ten Park Plaza, Suite 4160, Boston, MA 02116

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www.mass.gov/massdot

CZM Consistency Review Narrative

Bridge Replacement, C-07-001 Bridge Street over Mitchell River Chatham, Massachusetts

Project Description

Bridge Number C-07-001 (437) carries Bridge Street over the Mitchell River in the town of Chatham, Massachusetts (Barnstable County). The bridge is approximately 1.5 miles (2.4 km) from the mouth of the river, and there are no other structures crossing the waterway. The purpose of the project is to replace a structurally deficient bridge with a new bridge along a similar horizontal and vertical alignment. The project is an Accelerated Bridge Program (ABP) reconstruction that involves the replacement of an existing structure in the same location with a similar capacity.

This proposed project consists of a 195-foot (59.4 m) long, six-span bridge with a single-leaf bascule span over a 25-foot (7.6 m) clear horizontal navigation channel. The approach superstructure would include a timber wearing surface with the planks oriented diagonally to the roadway centerline. The timber wearing surface is attached to a timber structural deck. The timber structural deck is supported on glue-laminated (Glulam) lumber stringers. Crash-tested timber traffic railings, meeting AASHTO and NCHRP 350 requirements, separate the roadway from the sidewalk. The timber bridge railing may incorporate components from the existing wood railing.

The proposed substructure over the waterway consists of pile bents with concrete-filled, driven steel pipe piles, and reinforced concrete caps. The substructure at the ends of the bridge consists of pile-supported concrete abutments. The abutments include integral concrete wing walls (retaining walls) that extend along the approach roadway at the back of sidewalk to retain the roadway embankment. The embankments adjacent to the abutments and retaining walls along the waterway have rip rap slope protection.

The proposed bascule span channel provides 25 feet (7.6 m) of horizontal width between fenders, 7'-3" (2.2 m) of vertical clearance above mean high water when the bascule leaf is in the lowered position and unlimited vertical clearance with the bascule leaf fully raised. The pivot for the bascule leaf is located on the west side of the navigation channel. The bascule leaf is approximately 33 feet (10.1 m) from pivot to tip and rotates to completely clear the fender with the bascule leaf fully raised. In order to reduce the loads on the operating machinery, the bascule leaf is balanced by a 12.6-foot (3.8 m) long counterweight consisting of a steel counterweight box filled with concrete and steel ballast. The drive machinery consists of two independent drive

trains each directly coupled to the outboard end of the trunnion shafts. A means to manually operate the bridge is integrated into the drive train in the event of a complete loss of power to the motors.

The bascule leaf superstructure consists of a timber wearing surface with the planks oriented diagonally to the roadway centerline. The timber wearing surface is supported on and attached to steel open grid flooring panels. The proposed bascule leaf is supported on a concrete bascule pier and a concrete rest pier. The bascule pier and rest pier are supported on concrete-filled driven steel pipe piles. The exterior faces of the bascule pier would include stone facing using materials and details consistent with the local landscape. The fender system on each side of the navigation channel consists of a combination of horizontal and vertical timber members attached to the face of the concrete bascule pier and the rest bent.

CZM Consistency Certification

Coastal Hazards

Coastal Hazards Policy #1: Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.

The project will have permanent and temporary impacts to land under water/ocean. The project will comply with this policy by restoring all temporary impacts to land under water/ocean on site in order to maintain their beneficial function. Permanent impacts to land under water/ocean are unavoidable; however, the amount of impact is relatively small compared to the amount of available land under water/ocean habitat in the Stage Harbor system. There will be no impacts to dunes, beaches, barrier beaches and salt marsh.

Coastal Hazards Policy #2: Ensure that construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Flood or erosion control projects must demonstrate no significant adverse effects on the project site or adjacent or downcoast areas.

This project is not a flood or erosion control project. The project will comply with this policy by maintain the existing hydraulic opening in the design of the bridge in order to avoid interfering with water circulation and sediment transport. The use of cofferdams and turbidity barriers within the waterway are temporary and will not interfere with water circulation and sediment transport long-term.

Coastal Hazards Policy #3: Ensure that state and federally funded public works projects proposed for location within the coastal zone will:

- *Not exacerbate existing hazards or damage natural buffers or other natural resources.*
- *Be reasonably safe from flood and erosion-related damage.*
- *Not promote growth and development in hazard-prone or buffer areas, especially in velocity zones and Areas of Critical Environmental Concern.*
- *Not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource/Improvement Acts.*

The project will be designed to meet current design standards and follow state and federal guidelines for structures being built over waterways. The new structure will replace an existing structure in an already developed area that would be better suited to withstand flood and erosion related damage. By replacing the existing structurally deficient wooden bridge with a new bridge founded on steel and concrete elements, the proposed structure will be more resilient than the existing structure to flood events.

Coastal Hazards Policy #4: Prioritize acquisition of hazardous coastal areas that have high conservation and/or recreation values and relocation of structures out of coastal high-hazard areas, giving due consideration to the effects of coastal hazards at the location to the use and manageability of the area.

This policy is not applicable as the project does not involve acquisition of hazardous coastal areas.

Energy

Energy Policy #1: For coastally dependent energy facilities, assess siting in alternative coastal locations. For non-coastally dependent energy facilities, assess siting in areas outside of the coastal zone. Weigh the environmental and safety impacts of locating proposed energy facilities at alternative sites.

This policy is not applicable because the project is not a coastally dependent energy facility.

Energy Policy #2: Encourage energy conservation and the use of renewable sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.

This policy is not applicable because the project does not involve energy generation.

Growth Management

Growth Management Policy #1: Encourage sustainable development that is consistent with state, regional, and local plans and supports the quality and character of the community.

The existing structurally deficient bridge is being replaced with a bridge that incorporates a context sensitive design, and has been vetted through the Section 106 process.

Members of the community and other agencies have been consulted throughout the process to ensure the design provides a bridge that is consistent with the character of the community. Wooden elements have been incorporated into the superstructure to provide aesthetic value, while a modern substructure will provide a bridge that lasts considerably longer than the existing structure.

Growth Management Policy #2: Ensure that state and federally funded infrastructure projects in the coastal zone primarily serve existing developed areas, assigning highest priority to projects that meet the needs of urban and community development centers.

The Town of Chatham is an existing developed area in the coastal zone that accommodates a large number of tourists during the summer months. The project will comply with this policy as the structurally deficient bridge is being replaced in an existing developed community.

Growth Management Policy #3: Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and financial support for residential, commercial, and industrial development.

This policy is not applicable because the project is not a residential, commercial, or industrial development.

Habitat

Habitat Policy #1: Protect coastal, estuarine, and marine habitats—including salt marshes, shellfish beds, submerged aquatic vegetation, dunes, beaches, barrier beaches, banks, salt ponds, eelgrass beds, tidal flats, rocky shores, bays, sounds, and other ocean habitats—and coastal freshwater streams, ponds, and wetlands to preserve critical wildlife habitat and other important functions and services including nutrient and sediment attenuation, wave and storm damage protection, and landform movement and processes.

The project will comply with this policy by implementing appropriate construction BMP's to protect these habitats during construction, as well as through advanced design features that limit impacts to these habitats. BMP's include compost filter tubes in upland areas and turbidity curtains and cofferdams in tidal areas (Land Under Water/ocean). The

design approach to the project was to limit impacts to estuarine habitats to the greatest extent practical. This was accomplished by implementing extended wing walls and steeper than normal riprap slopes, which was able to eliminate all impacts to salt marsh, although the project limit does directly abut an area of salt marsh in the northwest quadrant of the bridge. The current design calls for the contractor to drive steel sheeting on the outside edge of the existing salt marsh area to protect the wetland during construction. To enhance the existing toe of slope, which is degraded by asphalt millings, after the steel sheeting has been removed the contractor will place suitable material in the area previously occupied by the sheeting, and plant two staggered rows of smooth cordgrass (*Spartina alterniflora*) with 2-inch peat pots spaced at 12 inches on center. If there are inadvertent temporary impacts to salt marsh during the extraction of the steel sheeting, additional salt marsh plantings will be conducted to restore the salt marsh to pre-construction conditions.

Habitat Policy #2: Advance the restoration of degraded or former habitats in coastal and marine areas.

The project will comply with this policy by including a salt marsh enhancement area at an existing degraded toe of slope in the northwest quadrant of the bridge, adjacent to an existing salt marsh area. After the steel sheeting has been removed from this location, the contractor will place suitable material in the area previously occupied by the sheeting, and plant two staggered rows of smooth cordgrass (*Spartina alterniflora*) with 2-inch peat pots spaced at 12 inches on center.

Ocean Resources

Ocean Resources Policy #1: Support the development of sustainable aquaculture, both for commercial and enhancement (public shellfish stocking) purposes. Ensure that the review process regulating aquaculture facility sites (and access routes to those areas) protects significant ecological resources (salt marshes, dunes, beaches, barrier beaches, and salt ponds) and minimizes adverse effects on the coastal and marine environment and other water-dependent uses.

This policy is not applicable because the project is not a commercial aquaculture facility.

Ocean Resources Policy #2: Except where such activity is prohibited by the Ocean Sanctuaries Act, the Massachusetts Ocean Management Plan, or other applicable provision of law, the extraction of oil, natural gas, or marine minerals (other than sand and gravel) in or affecting the coastal zone must protect marine resources, marine water quality, fisheries, and navigational, recreational and other uses.

This policy is not applicable because the project is not related to extraction of resources.

Ocean Resources Policy #3: Accommodate offshore sand and gravel extraction needs in areas and in ways that will not adversely affect marine resources, navigation, or shoreline areas due to alteration of wave direction and dynamics. Extraction of sand and gravel, when and where permitted, will be primarily for the purpose of beach nourishment or shoreline stabilization.

This policy is not applicable because the project is not related to extraction of offshore sand and gravel.

Ports and Harbors

Ports and Harbors Policy #1: Ensure that dredging and disposal of dredged material minimize adverse effects on water quality, physical processes, marine productivity, and public health and take full advantage of opportunities for beneficial re-use.

The incidental dredging associated with the bridge replacement will utilize BMP's such as turbidity barriers, cofferdams, compost filter tubes, and upland disposal of dredged material to minimize adverse impacts.

Ports and Harbors Policy #2: Obtain the widest possible public benefit from channel dredging and ensure that Designated Port Areas and developed harbors are given highest priority in the allocation of resources.

This policy is not applicable because the project is does not include channel dredging, and the project is not located in a Designated Port Area.

Ports and Harbors Policy #3: Preserve and enhance the capacity of Designated Port Areas to accommodate water-dependent industrial uses and prevent the exclusion of such uses from tidelands and any other DPA lands over which an EEA agency exerts control by virtue of ownership or other legal authority.

This policy is not applicable because the project is not located in a Designated Port Area.

Ports and Harbors Policy #4: For development on tidelands and other coastal waterways, preserve and enhance the immediate waterfront for vessel-related activities that require sufficient space and suitable facilities along the water's edge for operational purposes.

This policy is not applicable because the project is not related to a development on tidelands or other coastal waterways.

Ports and Harbors Policy #5: Encourage, through technical and financial assistance, expansion of water-dependent uses in Designated Port Areas and developed harbors, re-development of urban waterfronts, and expansion of physical and visual access.

This policy is not applicable because the project is not located in a Designated Port Area.

Protected Areas

Protected Areas Policy #1: Preserve, restore, and enhance coastal Areas of Critical Environmental Concern, which are complexes of natural and cultural resources of regional or statewide significance.

This policy is not applicable because the project is not located in an Area of Critical Environmental Concern.

Protected Areas Policy #2: Protect state designated scenic rivers in the coastal zone.

This policy is not applicable because the project is not located in a designated scenic river.

Protected Areas Policy #3: Ensure that proposed developments in or near designated or registered historic places respect the preservation intent of the designation and that potential adverse effects are minimized.

The Keeper of the National Register of Historic Places has determined in a notification letter dated October 1, 2010, that the existing 30-year-old Mitchell River Bridge is eligible for individual listing in the National Register. The proposed demolition of the existing bridge is, therefore, by definition, an adverse effect under the regulations implementing Section 106 [36 CFR 800.5(a)(2)(i)]. FHWA, as the lead federal agency for the undertaking, has conducted extensive consultations with interested local, statewide, and national parties to "develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate" the adverse effect to the National Register-eligible bridge, as required under the Section 106 regulations [36 CFR 800.6(a)]. MassDOT and other consulting parties have participated in those consultations.

MassDOT proposes to mitigate the adverse effect caused by the demolition of the existing NR-eligible Mitchell River Bridge by carrying out all of the stipulations in the MOA that was signed by the consulting parties. Those stipulations include MassDOT's commitment to design and build a context-sensitive new bridge based on the parameters established by the Preferred Alternative; afford the Section 106 consulting parties the opportunity to review and comment on the sketch plans for the replacement bridge, including its aesthetic details, as those plans are developed; support any future requests

for eligibility determinations for the structure by private entities; and prepare archival photographic documentation of the existing bridge for distribution to the Town of Chatham, Chatham Historical Commission for local depository.

Public Access

Public Access Policy #1: Ensure that development (both water-dependent or nonwater-dependent) of coastal sites subject to state waterways regulation will promote general public use and enjoyment of the water's edge, to an extent commensurate with the Commonwealth's interests in flowed and filled tidelands under the Public Trust Doctrine.

There is a public foot-path situated on a town owned parcel (parcel 15A-1) in the southeast quadrant of the bridge and a foot-path crossing privately owned property (parcel 15B-1B-1B) in the northeast quadrant of the bridge. Bridge Street East (parcel 15A-1) is a small formal town landing laid out and accepted by the town in 1908 with an area of 4,252 square feet. The town parcel contains a narrow natural pathway from Bridge Street that provides pedestrian access to the eastern shoreline of the Mitchell River. The north parcel, 157 Bridge Street (parcel 15B-1B-1B), is a privately owned parcel that contains a narrow natural pathway from Bridge Street that is used to access the eastern shoreline of the Mitchell River. The path on town parcel 15A-1 is the only public way to the Mitchell River in this vicinity; the next closest public access is 0.25 to 0.5 mile away. Both pathways will be maintained during the construction period, and a permanent path on the town parcel will be incorporated into the final design. The post-construction conditions of the northeast parcel will be comparable to what currently exists.

Public Access Policy #2: Improve public access to existing coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation and trail links (land- or water-based) to other nearby facilities. Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Ensure that the adverse impacts of developments proposed near existing public access and recreation sites are minimized.

As described under public access policy #1, the path on parcel 15A-1 is the only public way to the Mitchell River in this vicinity; the next closest public access is 0.25 to 0.5 mile away. The pathway will be maintained during the construction period, and a permanent path will be incorporated into the final design.

Public Access Policy #3: Expand existing recreation facilities and acquire and develop new public areas for coastal recreational activities, giving highest priority to regions of high need or limited site availability. Provide technical assistance to developers of both public and private

recreation facilities and sites that increase public access to the shoreline to ensure that both transportation access and the recreation facilities are compatible with social and environmental characteristics of surrounding communities.

This policy is not applicable because the project is not expanding an existing recreational facility.

Water Quality

Water Quality Policy #1: Ensure that point-source discharges and withdrawals in or affecting the coastal zone do not compromise water quality standards and protect designated uses and other interests.

The upgrade of the stormwater system in the vicinity of the bridge, will improve water quality from existing conditions through the installation of four new deep sump catch basins to replace the two existing outdated catch basins in the vicinity of the bridge. The stormwater design will utilize the existing outfall on the east side of the bridge (with upgrades as necessary), and construct a new outfall with energy dissipater pad on the west side of the bridge.

Water Quality Policy #2: Ensure the implementation of nonpoint source pollution controls to promote the attainment of water quality standards and protect designated uses and other interests.

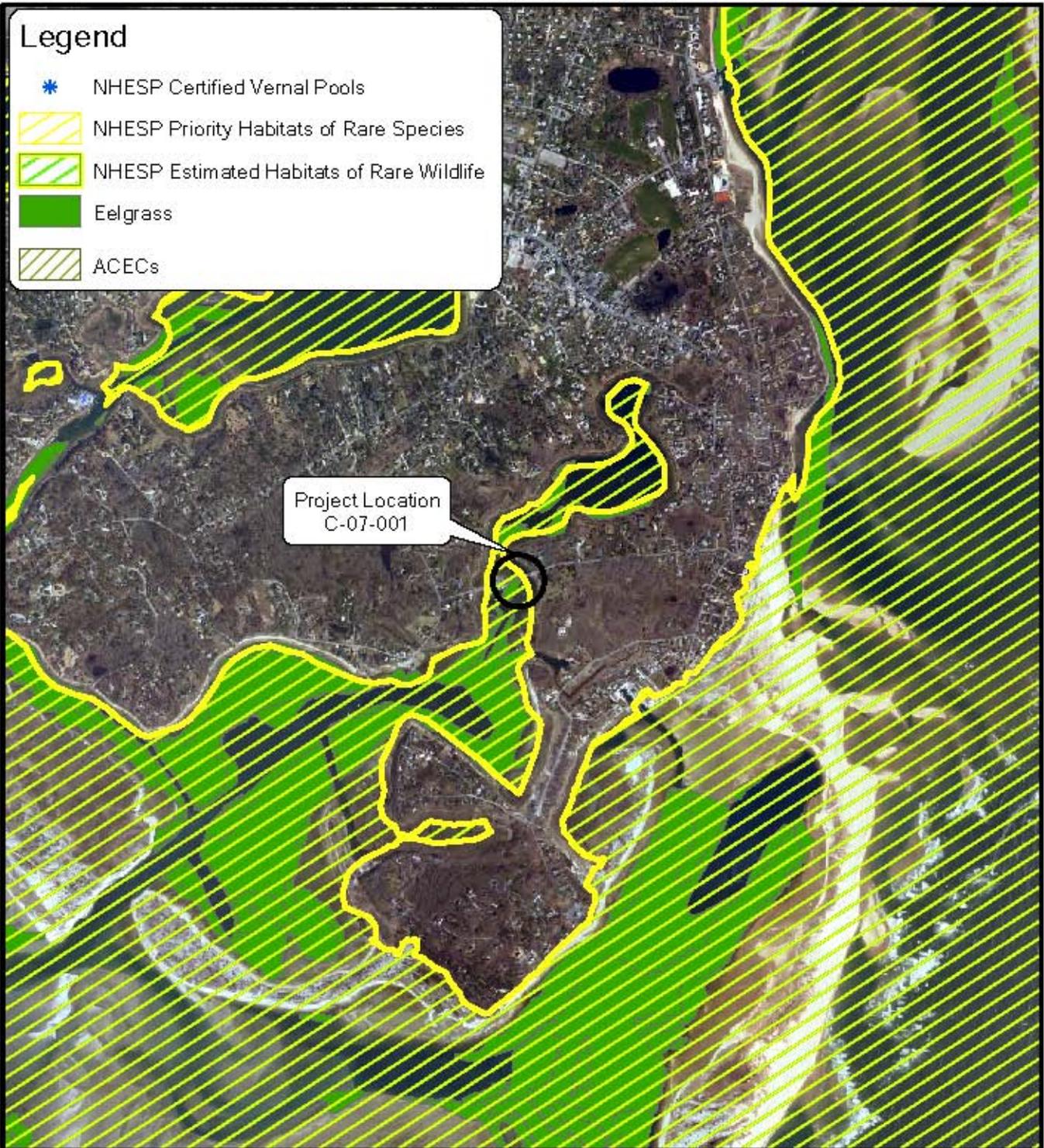
The project will comply with this policy by implementing appropriate BMP's and through design features aimed at reducing sedimentation and erosion. The project will utilize construction BMP's in order to minimize the transport of sediment during construction. BMP's will include compost filter tubes in upland areas and a turbidity curtain and cofferdam in tidal areas (land under water/ocean). Riprap will be placed on the slopes of the roadway and in front of the abutments as part of the design to prevent future scour and erosion.

Water Quality Policy #3: Ensure that subsurface waste discharges conform to applicable standards, including the siting, construction, and maintenance requirements for on-site wastewater disposal systems, water quality standards, established Total Maximum Daily Load limits, and prohibitions on facilities in high-hazard areas.

This is not applicable as there will be no subsurface waste discharges.

Legend

-  NHESP Certified Vernal Pools
-  NHESP Priority Habitats of Rare Species
-  NHESP Estimated Habitats of Rare Wildlife
-  Eelgrass
-  ACECs



Project Location
C-07-001

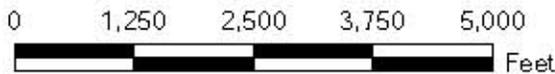
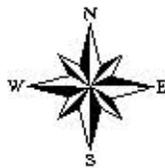


FIGURE 2
HABITAT MAP

BRIDGE ST BRIDGE C-07-001
CHATHAM, MA

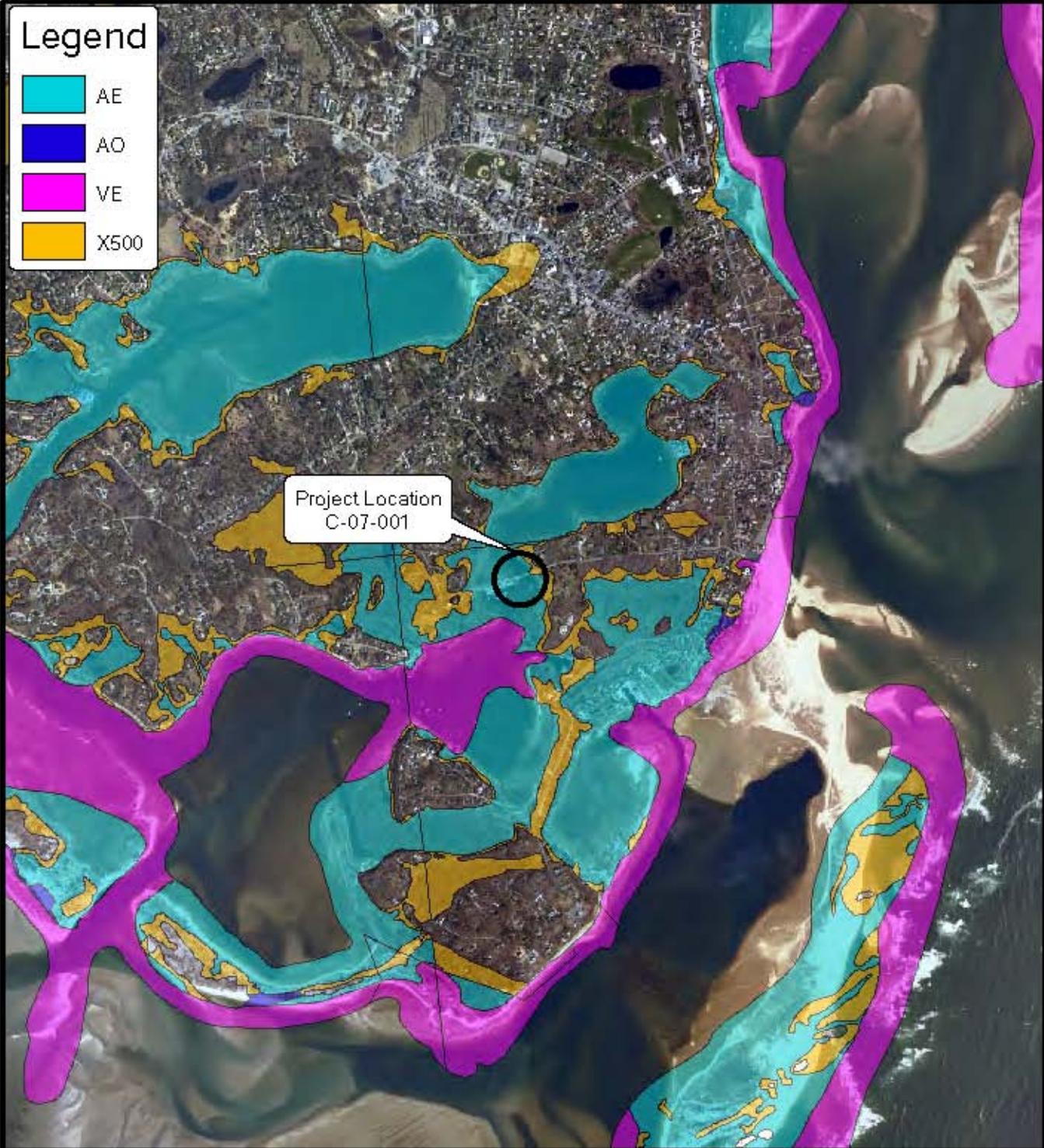
URS

260 FRANKLIN STREET, SUITE 300
BOSTON, MASSACHUSETTS
(617) 512-4314

Project No. 10160737

JULY 2009

File: J:\M asc Highway\2009_SEDRSCM_6\Assignment #1 - Chatham Bridge\800 CADD - GIS - Graphics\520 GIS\Bridge St FEMA Map.mxd



Project Location
C-07-001

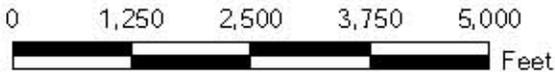
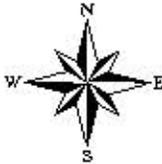


FIGURE 3
FEMA MAP

BRIDGE ST BRIDGE C-07-001
CHATHAM, MA



260 FRANKLIN STREET, SUITE 300
BOSTON, MASSACHUSETTS
(617) 512-4314

Source: MassGIS

Project No. 10160737

JULY 2009

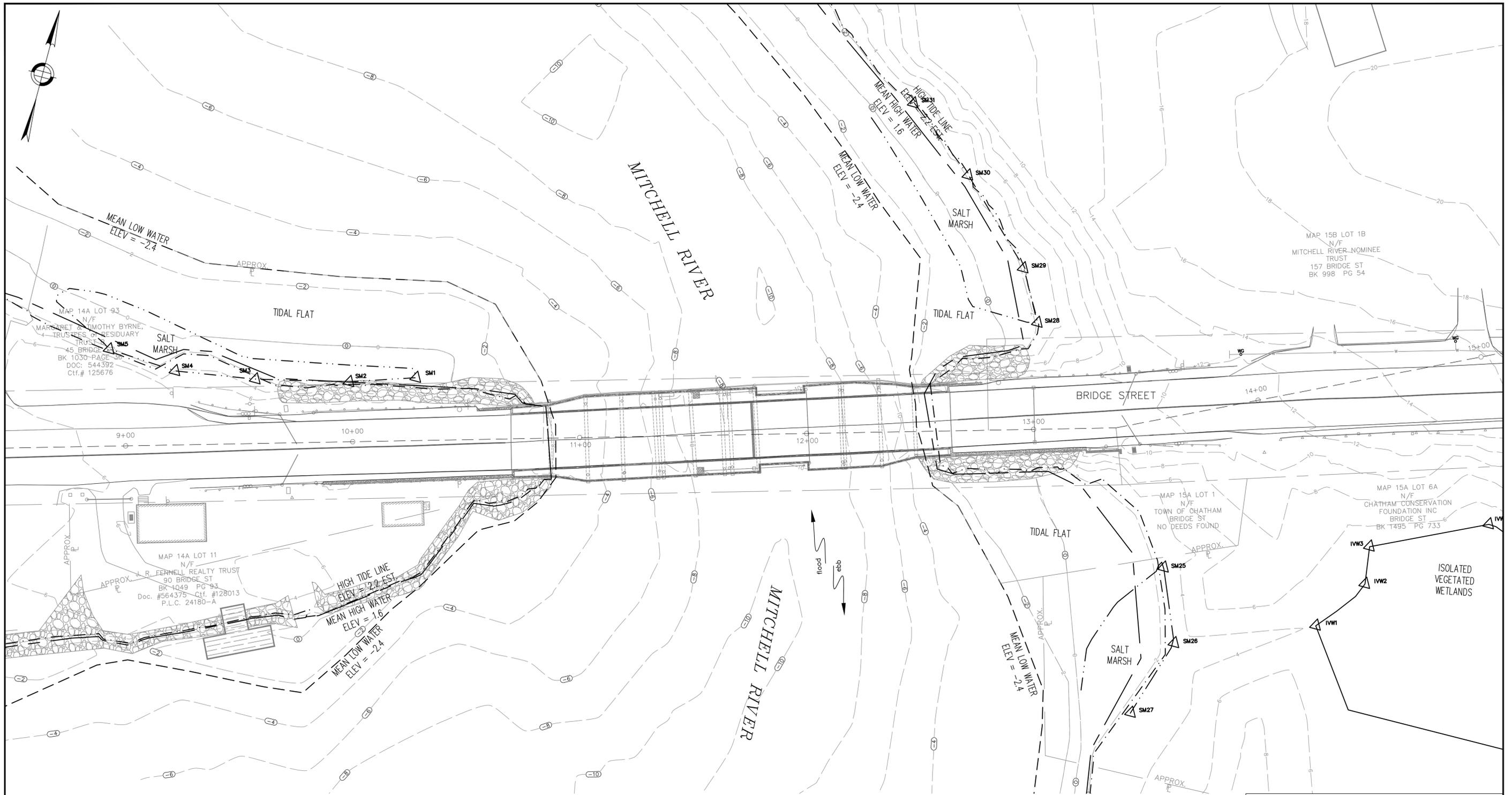


Photo No. 3	Date 7/9/09	
Direction Photo Taken: South		
Description: Northeast quadrant of the bridge showing existing riprap and abutment		

Photo No. 4	Date 7/9/09	
Direction Photo Taken: North		
Description: Northeast quadrant of the bridge showing wetlands and shoreline		

Photo No. 5	Date 7/9/09	
Direction Photo Taken: North		
Description: Southwest quadrant of the bridge showing existing riprap, and abutment		

Photo No. 6	Date 7/9/09	
Direction Photo Taken: West		
Description: Northwest quadrant of the bridge showing existing riprap and boat launch in the distance		



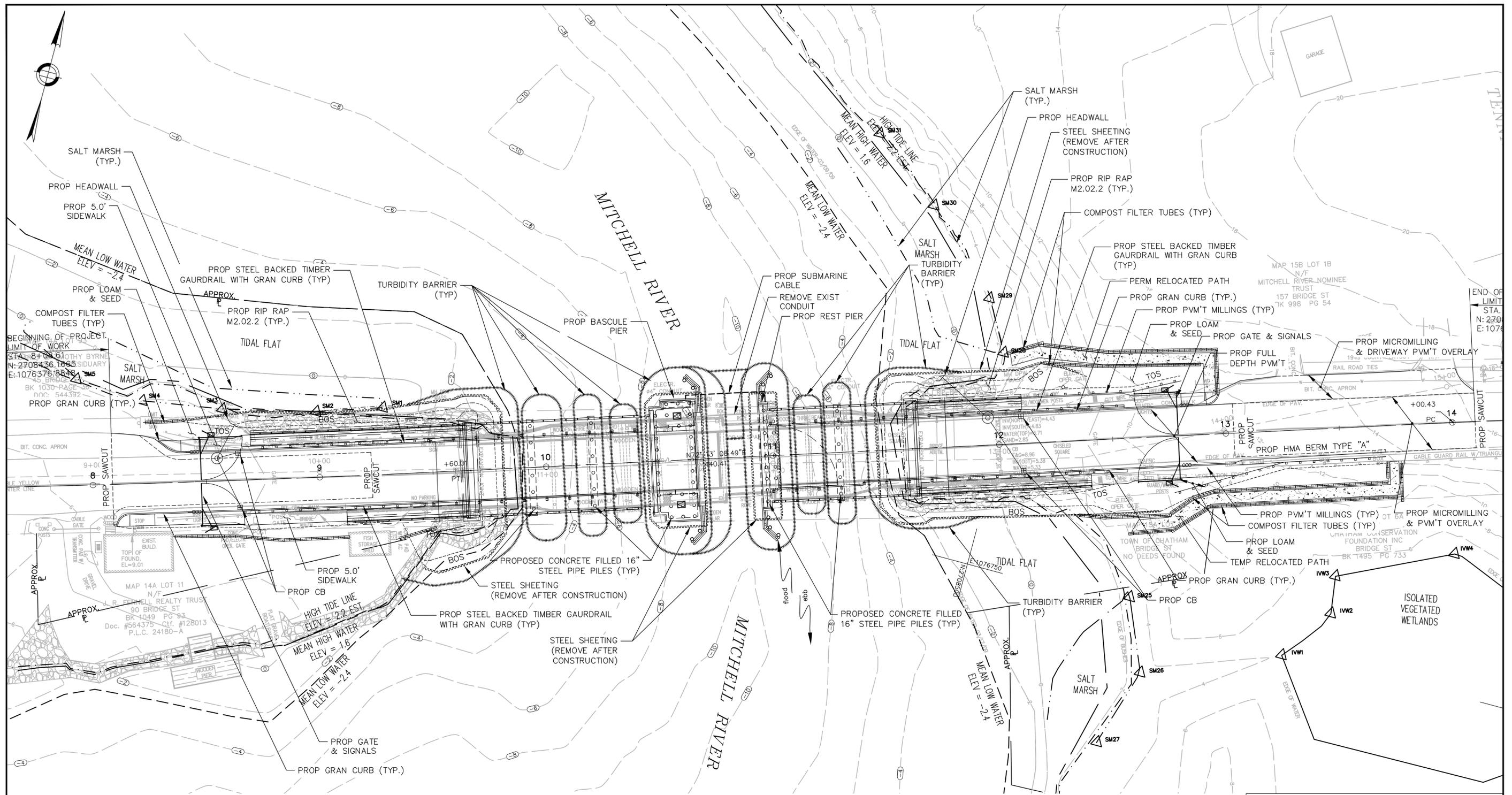
LEGEND

- HIGH TIDE LINE
- MEAN HIGH WATER +1.6
- - - SALT MARSH
- - - MEAN LOW WATER -2.4



NOTE:
1. ELEVATION DATUM IS NAVD88

MASSDOT – HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY: BRIDGE STREET CHATHAM, MASSACHUSETTS			
PROJECT NO.:			
TITLE: WETLAND PLAN			
CONSULTANT:		URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110	
DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.: 1



LEGEND

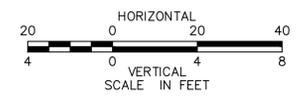
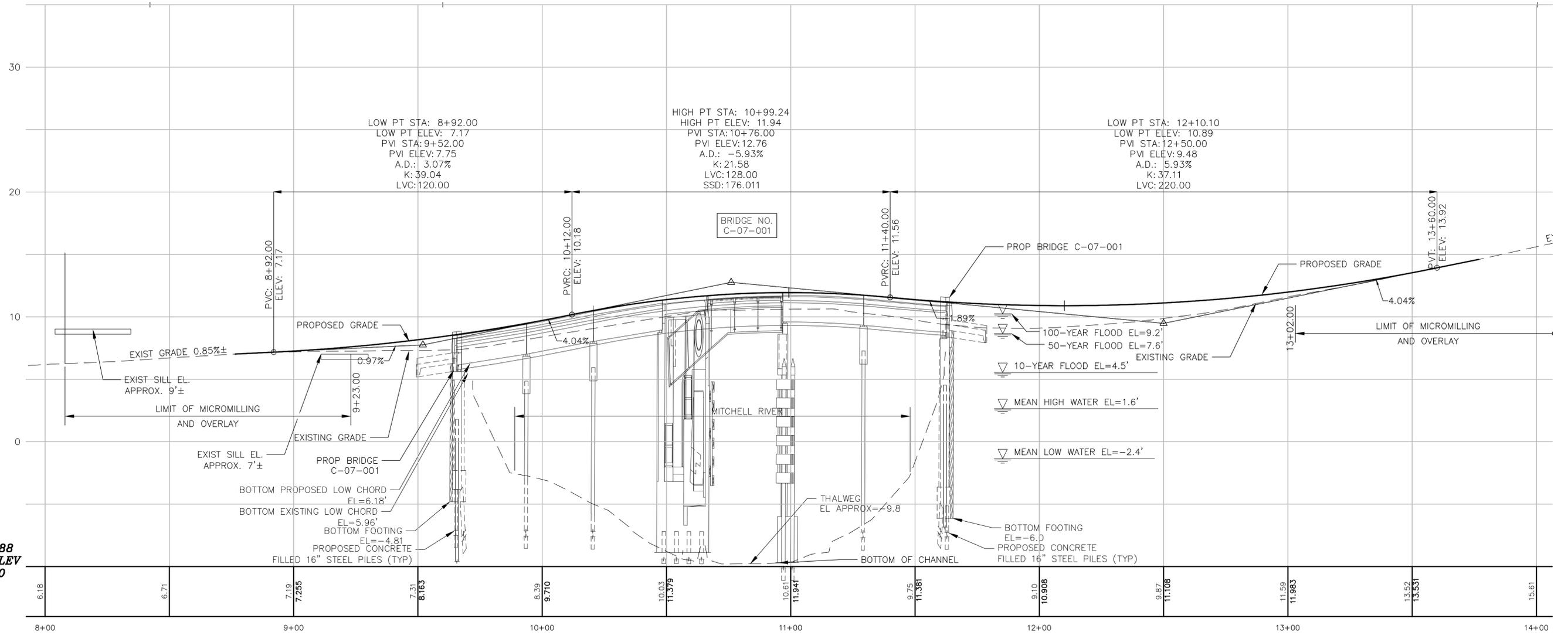
- HIGH TIDE LINE
- MEAN HIGH WATER +1.6
- SALT MARSH
- MEAN LOW WATER -2.4



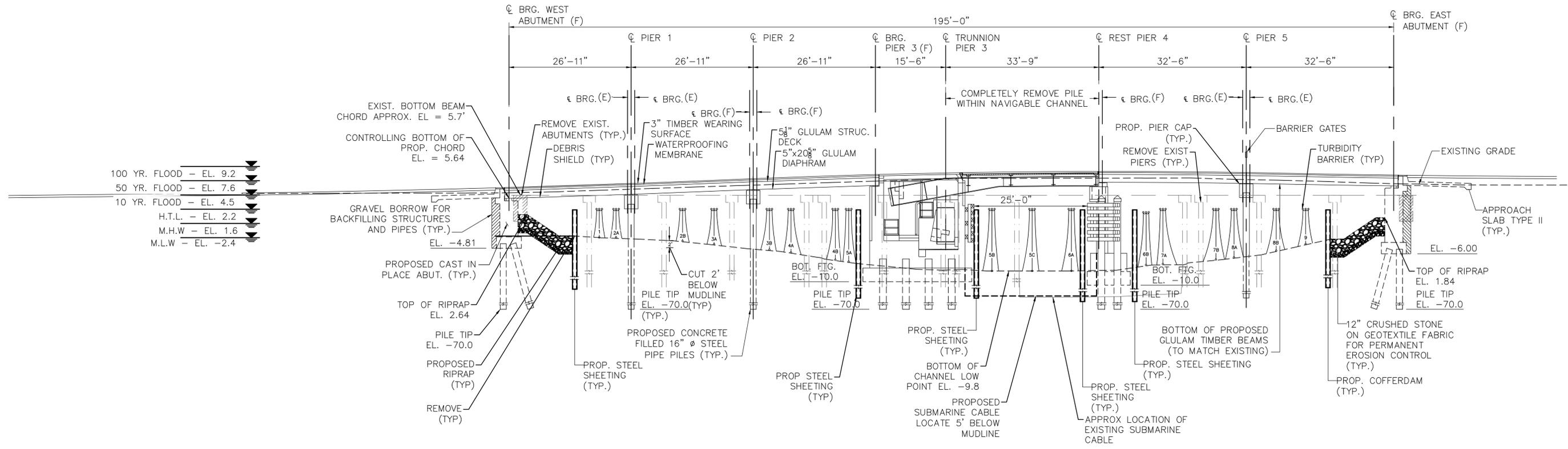
NOTE:
1. ELEVATION DATUM IS NAVD88

MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY:		BRIDGE STREET CHATHAM, MASSACHUSETTS	
PROJECT NO.:			
TITLE:		GENERAL PLAN	
CONSULTANT:		URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110	
DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.: 2

NAVD 88
BASE ELEV
-10.00

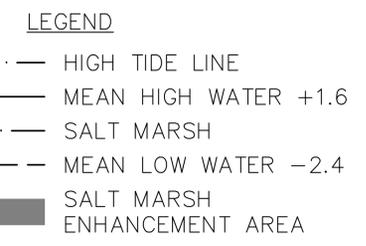
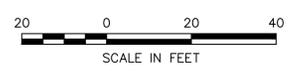
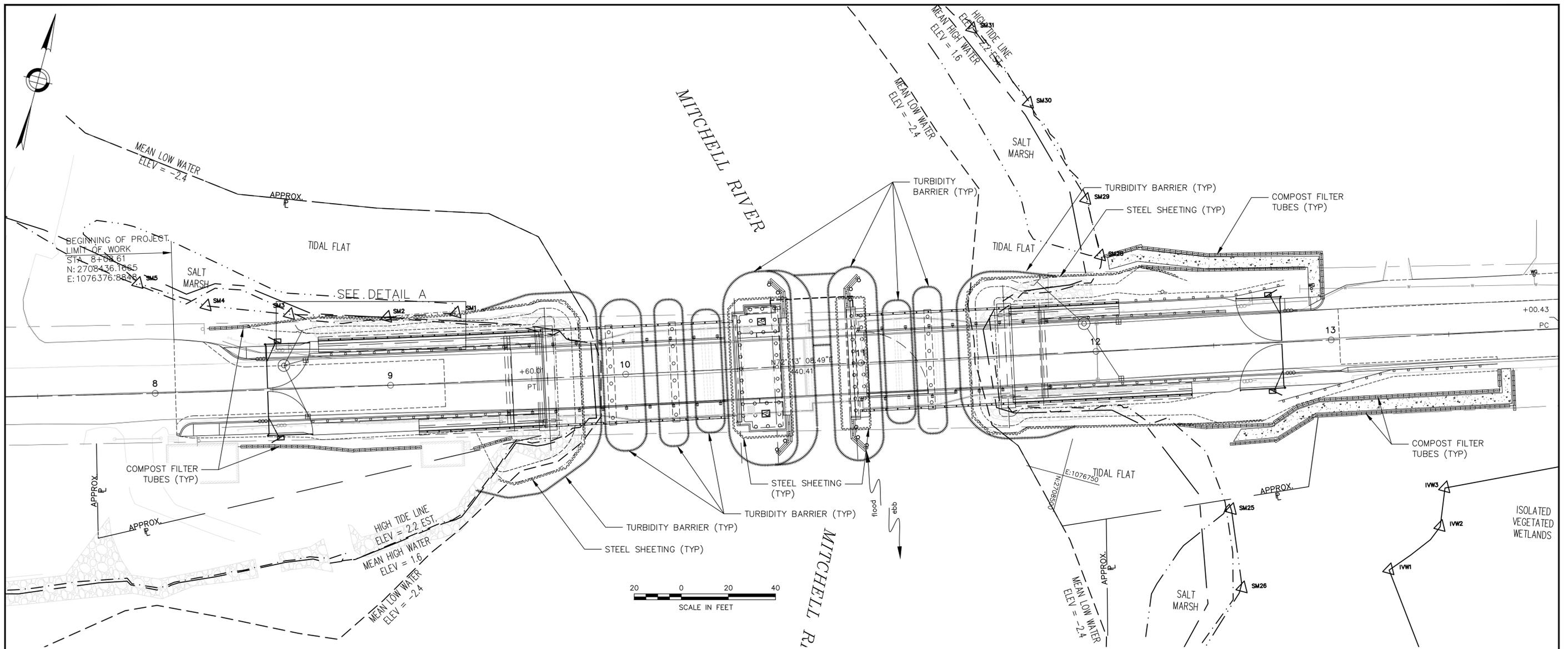


MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY:		BRIDGE STREET CHATHAM, MASSACHUSETTS	
PROJECT NO.:			
TITLE:		PROFILE	
CONSULTANT:		URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110	
DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.: 3

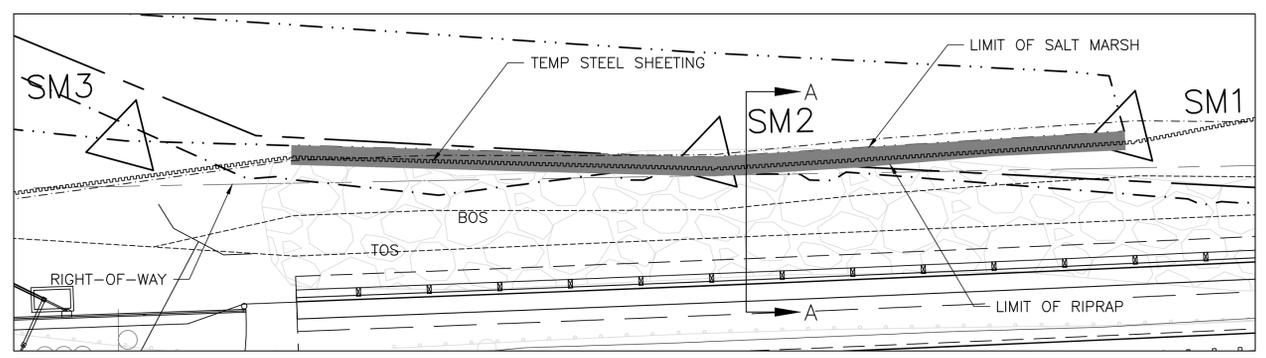


MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY: BRIDGE STREET CHATHAM, MASSACHUSETTS		PROJECT NO.:	
TITLE: LONGITUDINAL SECTION			
CONSULTANT: URS URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110		DESIGNED BY: HJH DRAWN BY: HJH CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.: 4

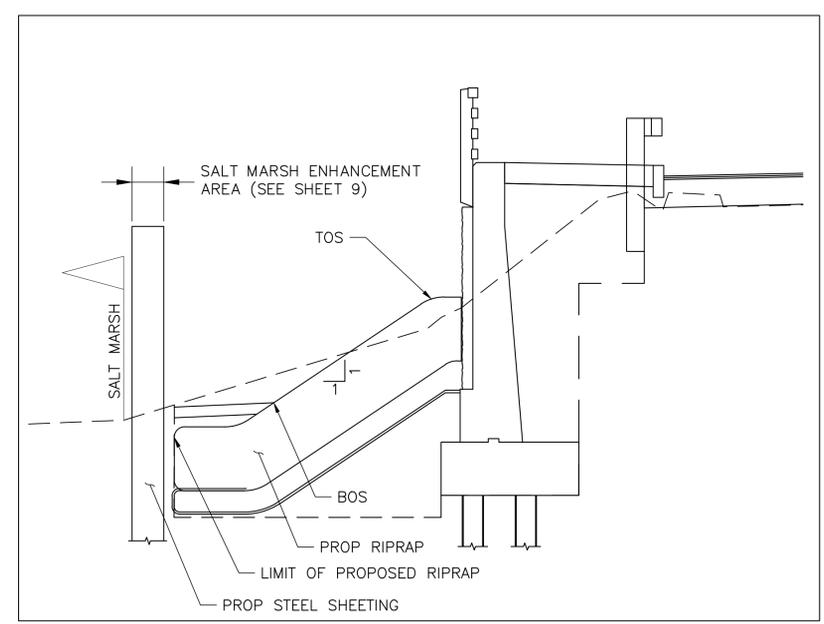
N.T.S



NOTE:
1. ELEVATION DATUM IS NAVD88



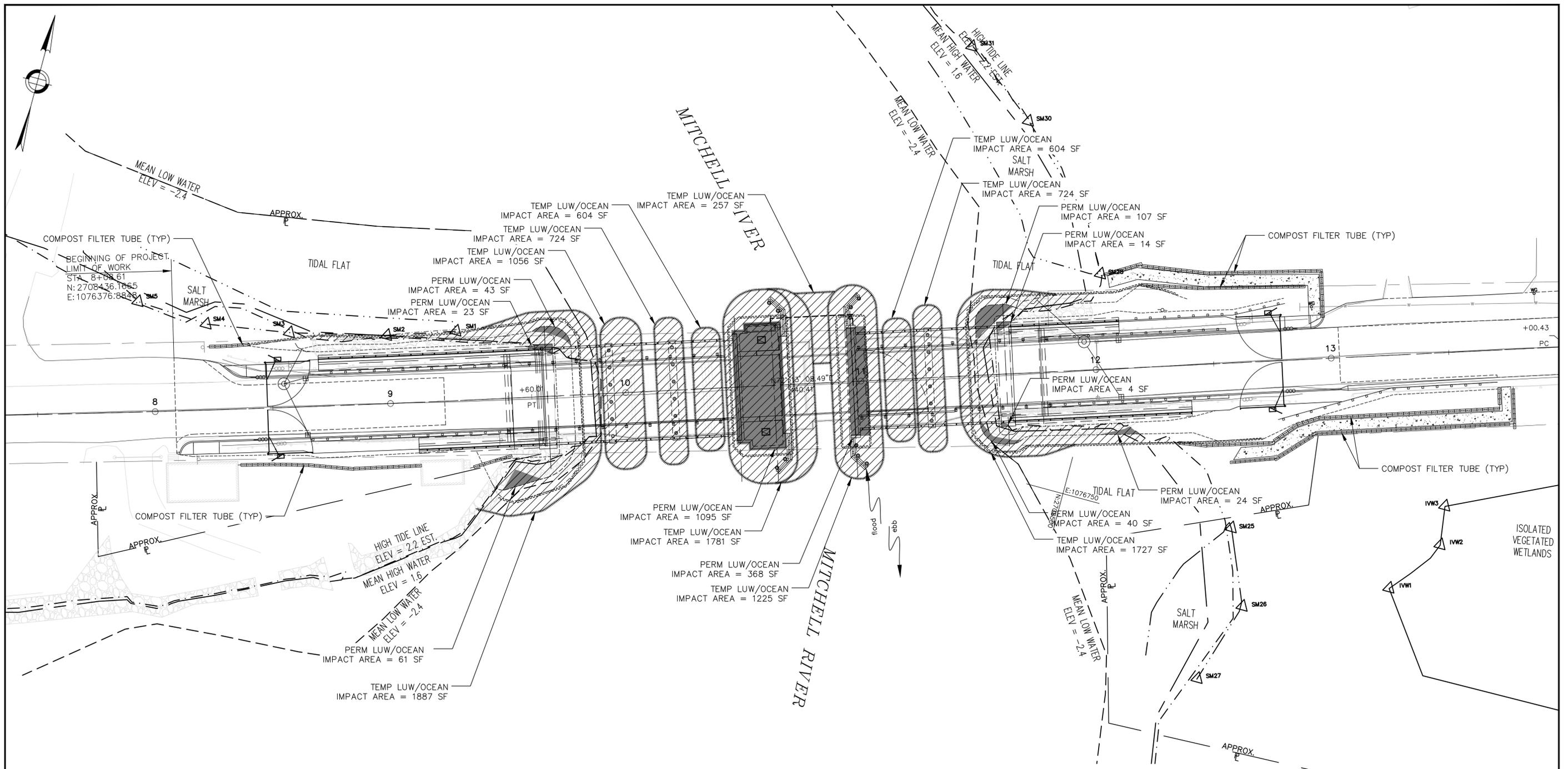
DETAIL A
NTS



SECTION A-A
NTS

MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY: BRIDGE STREET CHATHAM, MASSACHUSETTS			
PROJECT NO.:			
TITLE: WATER CONTROL & RETAINING WALL PLAN			
CONSULTANT: URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110			

DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012



LEGEND

- HIGH TIDE LINE
- MEAN HIGH WATER +1.6
- SALT MARSH
- MEAN LOW WATER -2.4
- LUW/OCEAN TEMPORARY IMPACT
- LUW/OCEAN PERMANENT IMPACT

NOTE:
1. ELEVATION DATUM IS NAVD88



IMPACT SUMMARY		
RESOURCE AREA	SUBTOTAL	TOTAL
TEMP LUW/OCEAN*	10587	10491
PERM LUW/OCEAN**	1778	1819
TOTALS	12365	12310

* TEMP REDUCED BY 96 S.F. TO ACCOUNT FOR EXISTING PILES, 121 @ 0.79'
 ** PERM INCREASED BY 41 S.F. TO ACCOUNT FOR NEW PILES, 31 @ 1.33'

DREDGING IMPACTS		
RESOURCE AREA	S.F.	C.Y.
LUW/OCEAN	3668	543

**MASSDOT – HIGHWAY DIVISION
BOSTON MASSACHUSETTS**

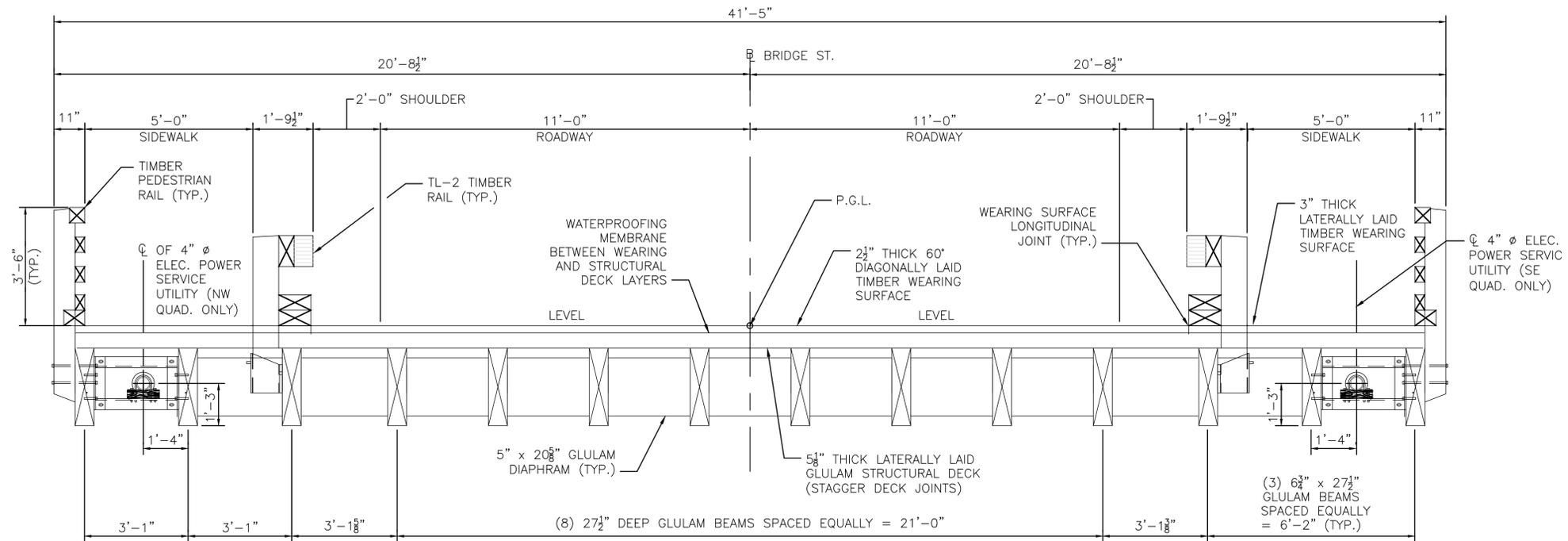
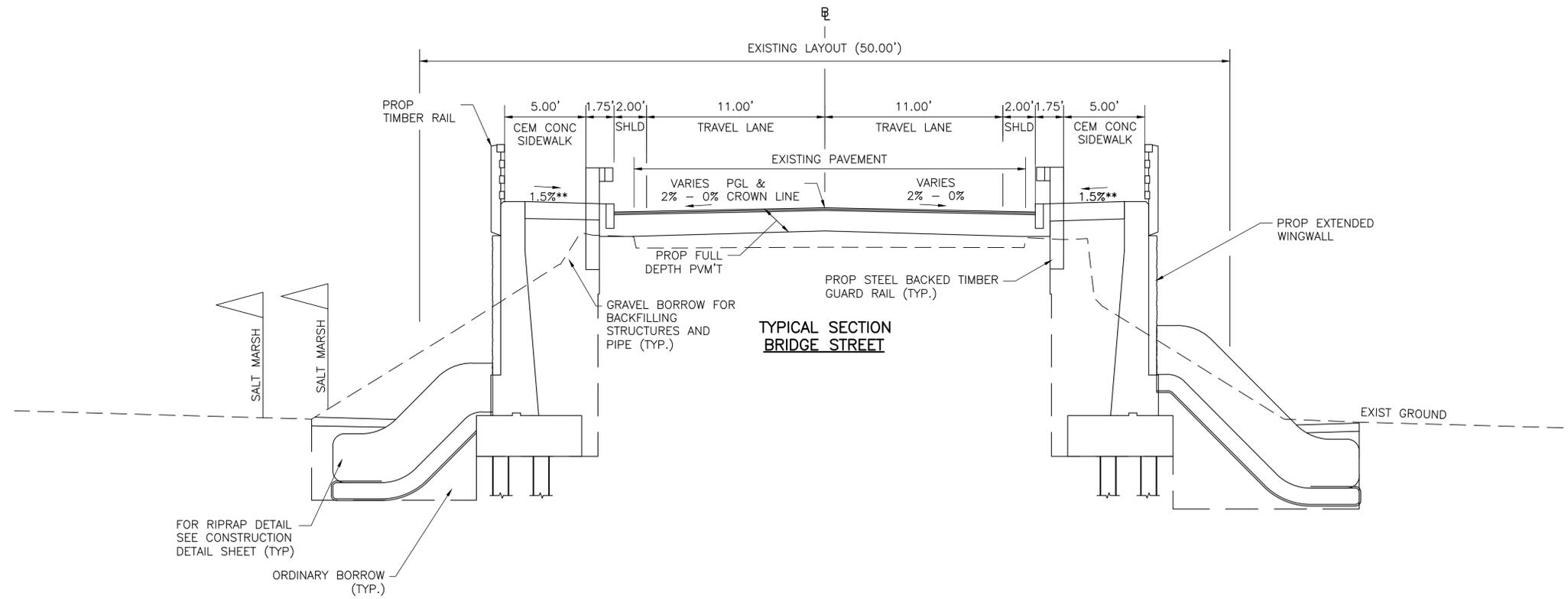
FACILITY: BRIDGE STREET
CHATHAM, MASSACHUSETTS

PROJECT NO.:
TITLE: WETLAND IMPACT PLAN

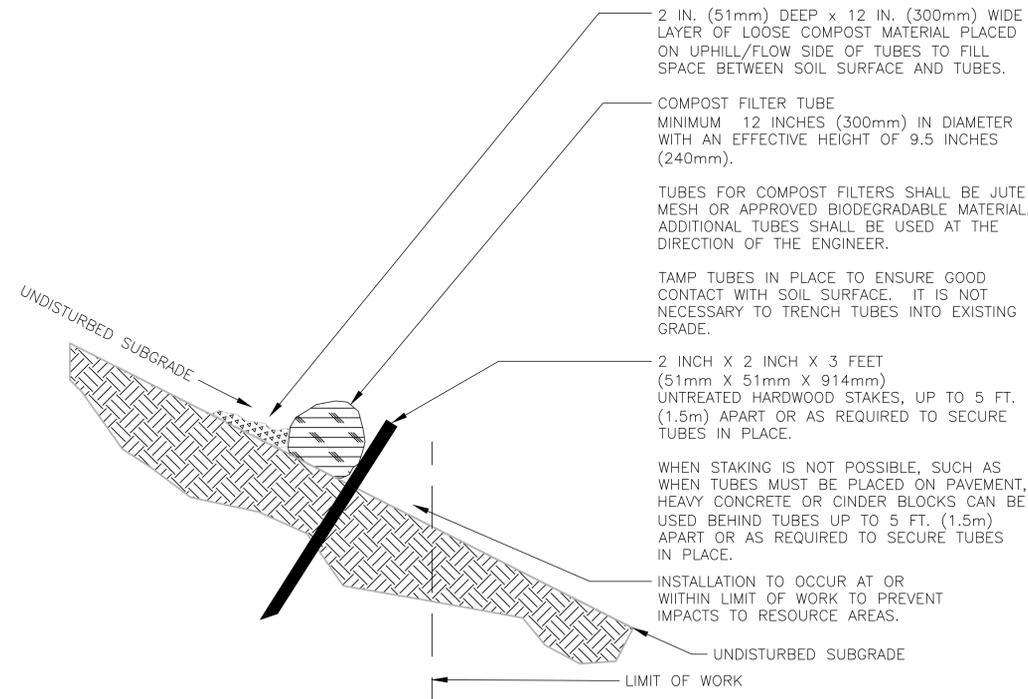
CONSULTANT:
 URS Corporation
 260 Franklin Street
 Suite # 300
 Boston, MA 02110

DESIGNED BY: HJH DRAWN BY: HJH CHKD. BY: CMC

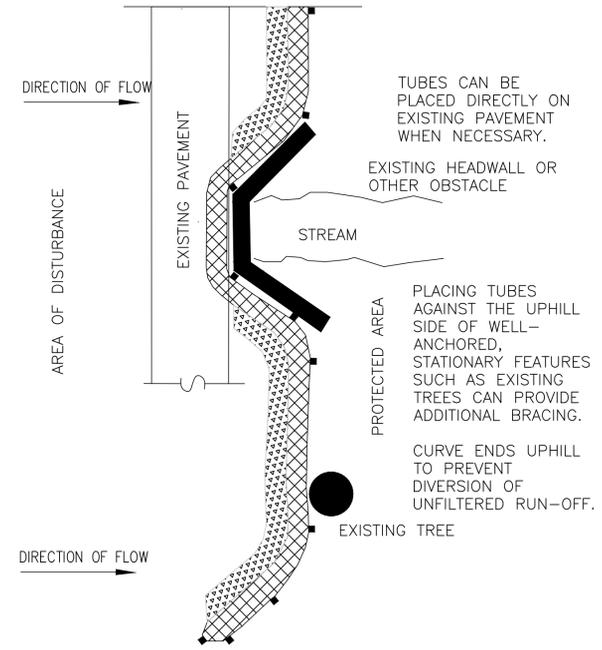
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MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY: BRIDGE STREET CHATHAM, MASSACHUSETTS			
PROJECT NO.:			
TITLE: TYPICAL CROSS SECTIONS			
CONSULTANT: URS URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110			
DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.: 7

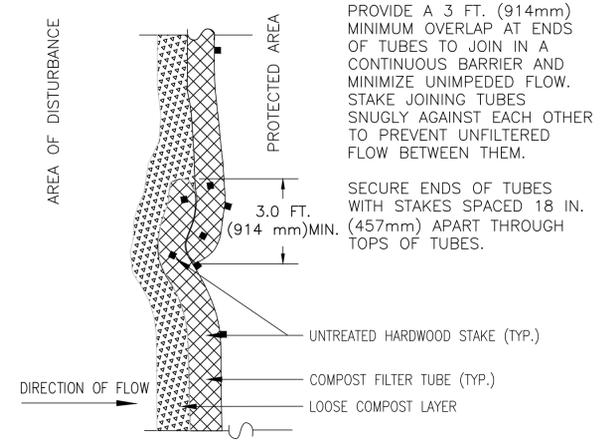


SECTION VIEW



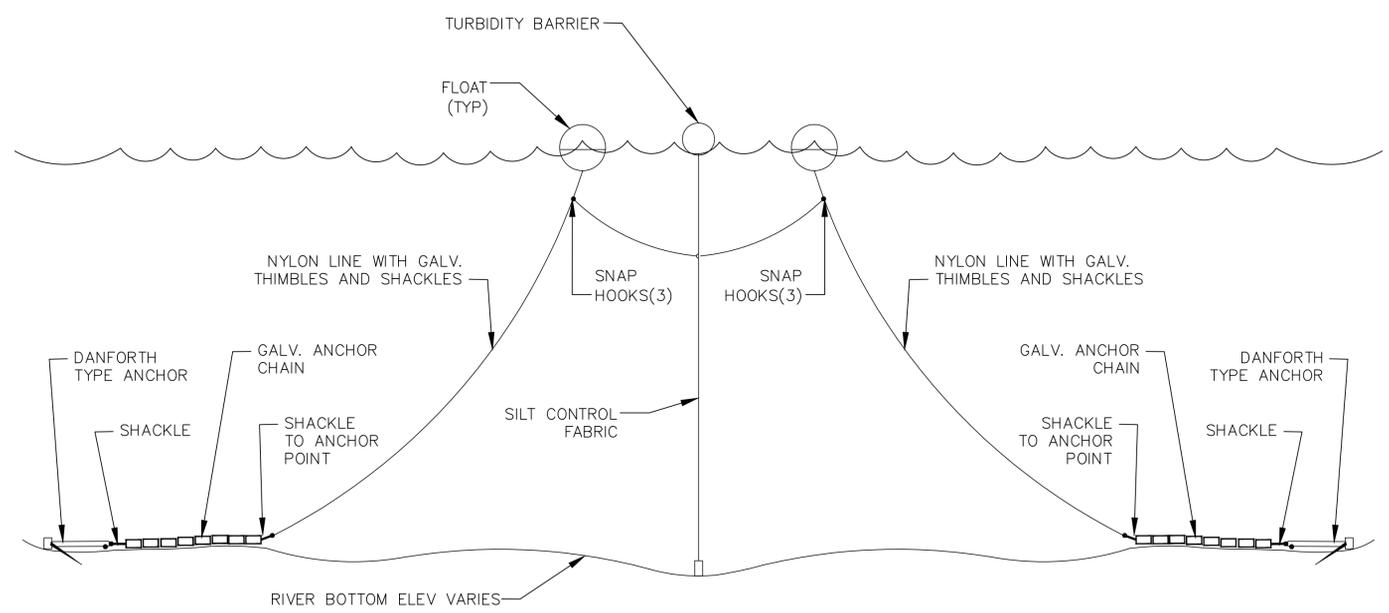
PLAN VIEW

- GENERAL NOTES:
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
 2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
 3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
 4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.

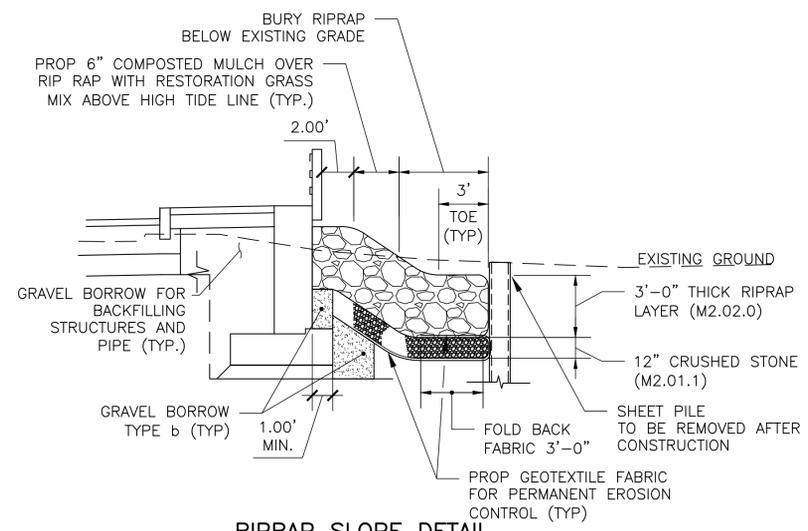


PLAN VIEW - JOIN DETAIL

SINGLE COMPOST FILTER TUBE DETAIL



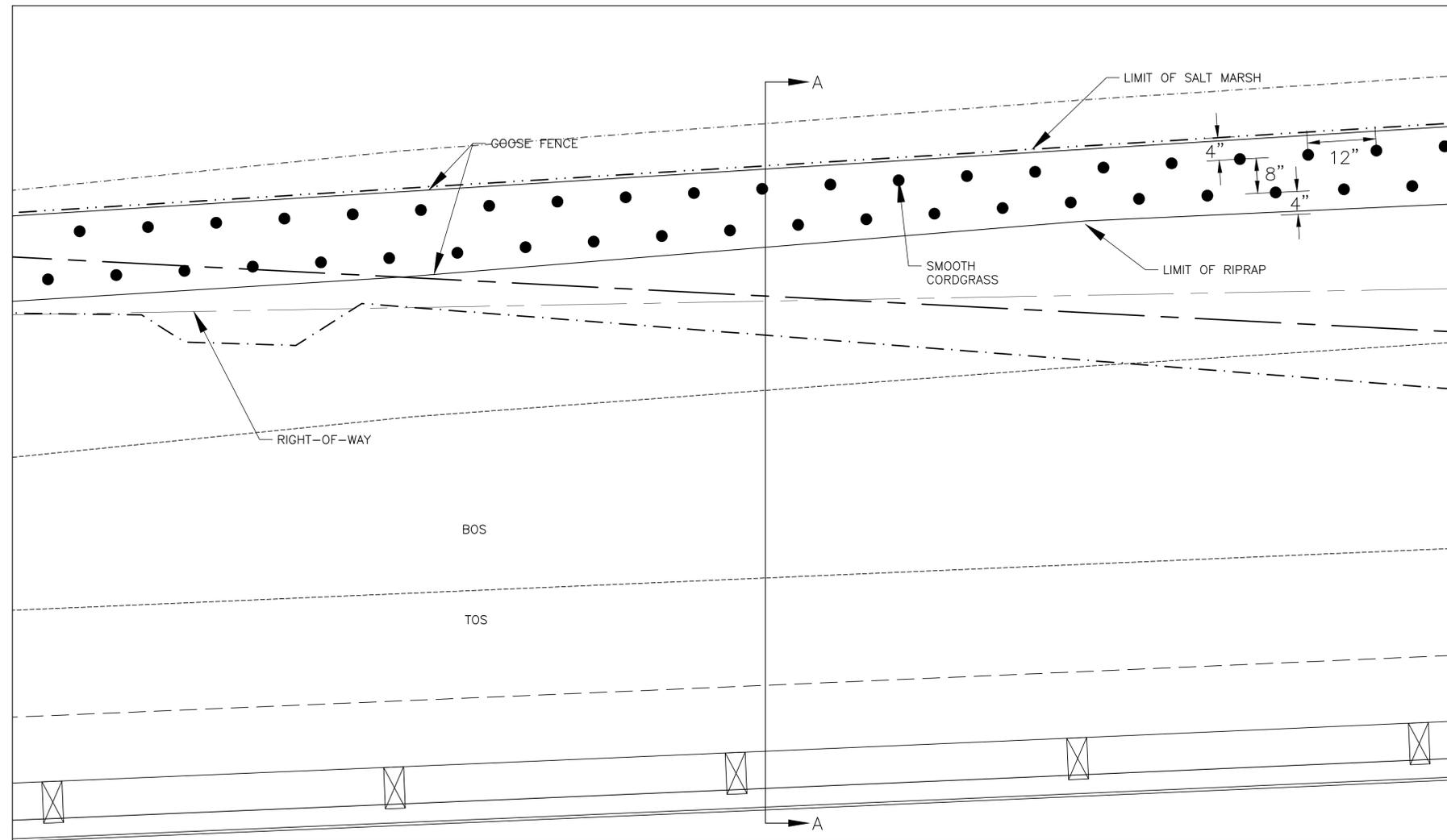
ANCHOR
NTS



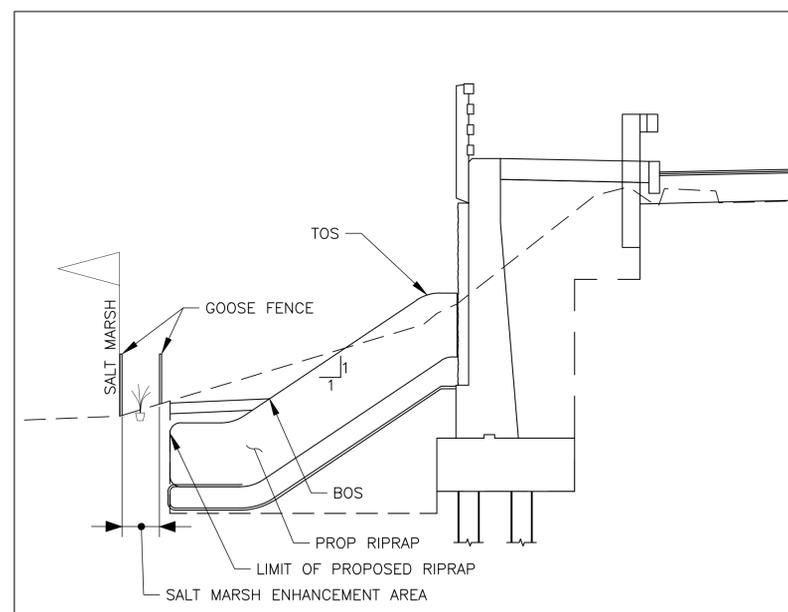
RIPRAP SLOPE DETAIL
NTS

MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY:	BRIDGE STREET CHATHAM, MASSACHUSETTS		
PROJECT NO.:	TYPICAL DETAILS		
CONSULTANT:	 URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110		
DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.: 8

NOTE: BOTTOM OF TURBIDITY BARRIER SHALL EXTEND TO RIVER BOTTOM DURING EXCAVATION AND FILLING OPERATIONS.



DETAIL A
NTS



SECTION A-A
NTS

LEGEND

- HIGH TIDE LINE
- MEAN HIGH WATER +1.6
- SALT MARSH
- MEAN LOW WATER -2.4

NOTE:

1. ELEVATION DATUM IS NAVD88

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FACILITY: BRIDGE STREET
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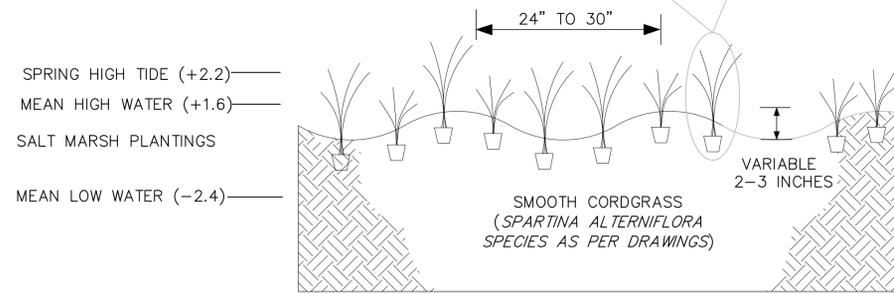
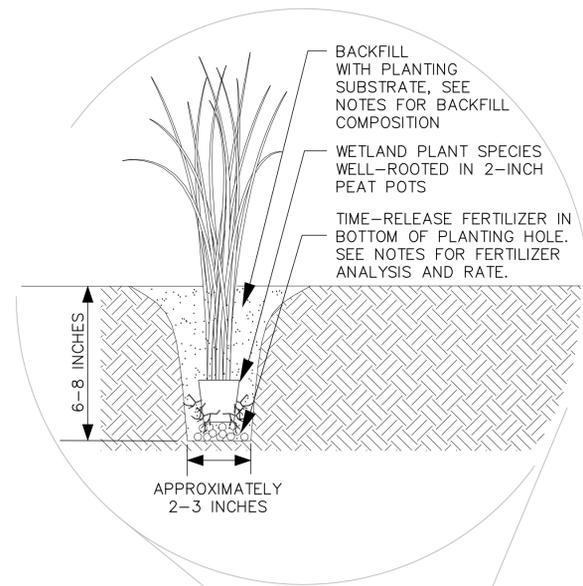
PROJECT NO.:

TITLE: WETLAND ENHANCEMENT PLAN

CONSULTANT: **URS** URS Corporation
260 Franklin Street
Suite # 300
Boston, MA 02110

DESIGNED BY: HJH DRAWN BY: HJH CHKD. BY: CMC

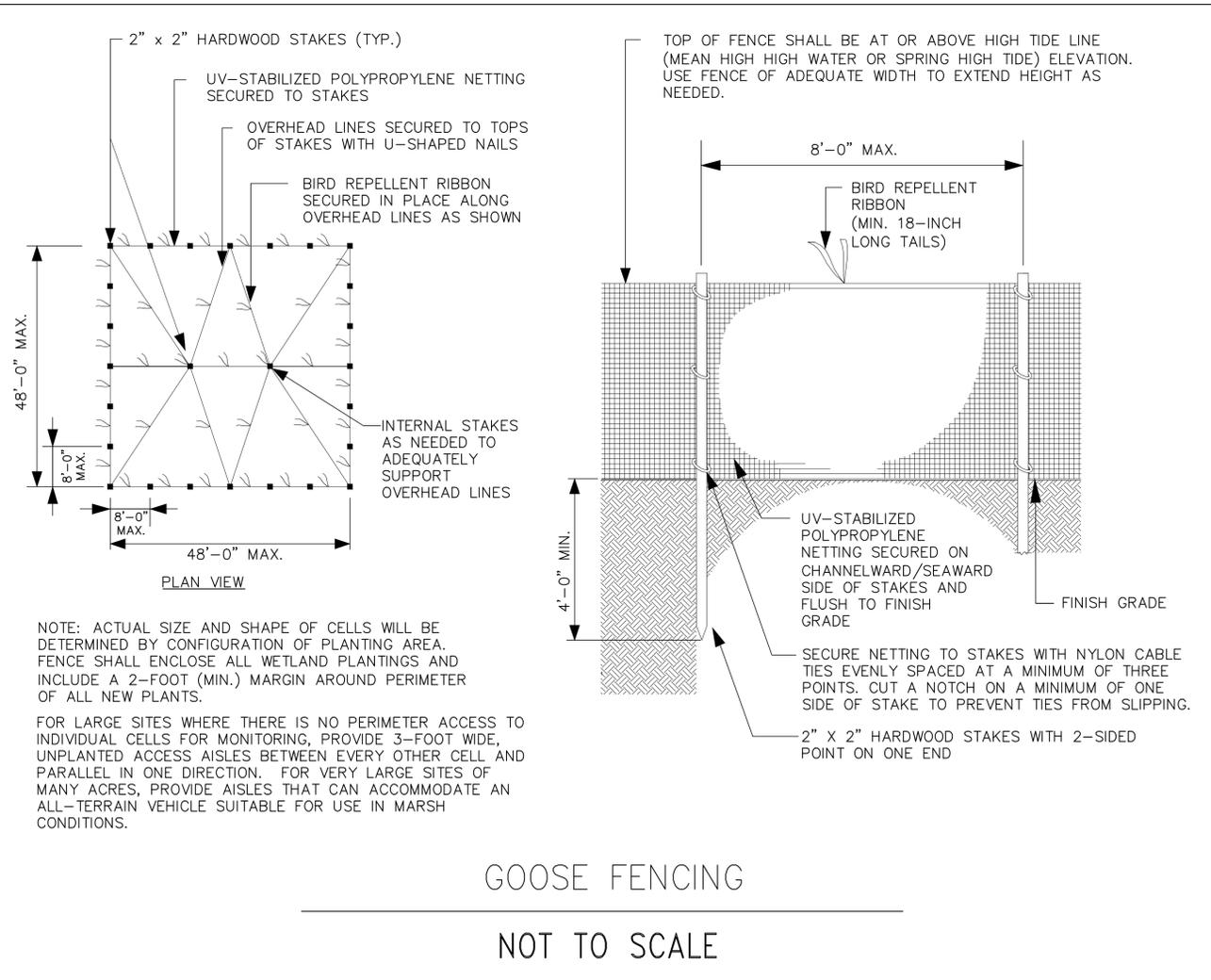
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TRANSVERSE VIEW

SALT MARSH PLANTING
NOT TO SCALE

NOTE: GROUND COVER THROUGHOUT SALT MARSH ENHANCEMENT AREA SHALL BE PLANTED WITH SMOOTH CORDGRASS WITH 2" PEAT POTS PLANTED 12" ON CENTER.



MASSDOT - HIGHWAY DIVISION BOSTON MASSACHUSETTS			
FACILITY:		BRIDGE STREET CHATHAM, MASSACHUSETTS	
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CONSULTANT:		 URS Corporation 260 Franklin Street Suite # 300 Boston, MA 02110	
DESIGNED BY: HJH	DRAWN BY: HJH	CHKD. BY: CMC	
SCALE: AS NOTED	APPROVED: TFR	DATE: 12/18/2012	SHEET NO.:
			10