

February 2, 2012

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION  
DEPARTMENT OF TRANSPORTATION  
RHODE ISLAND CONTRACT NO.2011-CB-096  
FEDERAL-AID PROJECT NO. FAP Nos: 3RD-PRTY(212), BRO-0383(002)

**Natick Bridge No. 383**

River St. Station 5+63 to East Ave. Station 18+00.  
CITY/TOWN OF West Warwick, Warwick  
COUNTY OF KENT

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 1 Prospective bidders and all concerned are hereby notified of the following changes in the Plans, Specifications, Proposal and Distribution of Quantities for this contract. These changes shall be incorporated in the Plans, Specifications, Proposal and Distribution of Quantities, and shall become an integral part of the Contract Documents.

**A. Clarification**

1. Pre-Bid Conference

Attached is a copy of the Pre-Bid Conference sign-in sheet.

**B. Contract Documents**

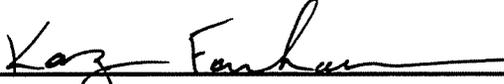
1. CS-Pages

a. Page CS-4

Remove page CS-4 in its entirety and replace it with revised page CS-4 (R-1) attached to this Addendum No. 1. The Section 11 Utility and Municipal Notification and Coordination has been revised to remove reference to demolished buildings.

b. Appendix F

Remove Appendix F in its entirety and replace it with revised Appendix F (R-1) attached to this Addendum No. 1. The Final Remedial Action Work Plan (RAWP) has been included.

  
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RI Department of Transportation  
Chief Engineer



## **7. SCHEDULE LEVEL**

This project is identified as "Schedule Level B", as described in Section 12.108.03 of the RI Department of Administration Procurement Regulations at Section 12.

## **8. REQUIRED CERTIFICATIONS**

The Contractor is alerted that certain certification requirements are included in this contract, including but not limited to the following:

- Concrete precasting plants shall be PCI Category B4 certified, as further described on the plans.

## **9. FABRICATION AND DELIVERY**

At the time of the execution of the Contract, the successful bidder shall furnish both to the Department and the Division of Purchases' satisfaction a Contract bond for each of the following various components described below, and in an amount equal to the value of the associated completed work delivered to the site. The bond shall meet all other requirements of Section 12.103.05 of the RI Department of Administration Procurement Regulations at Section 12.

- By the concrete precast manufacturer for the various precast components.

## **10. TEMPORARY EARTH RETAINING SYSTEMS, TEMPORARY CONTAINMENT BARRIER AND DEWATERING**

There will be no separate payment made for Temporary Earth Retaining Systems, Temporary Containment Barrier and Dewatering on this project. Costs for these shall be included in the various appropriate items for which they are required.

## **11. UTILITY AND MUNICIPAL NOTIFICATION AND COORDINATION**

The locations of all utilities on the Plans are approximate. The Contractor shall check and verify the exact location of all existing utilities, both overhead and underground, with Dig Safe at (888) DIG-SAFE in Rhode Island. Any damage to utilities shall be the Contractor's responsibility. Costs of such damage shall be borne by the Contractor. No excavation shall be done until all involved utility companies are notified at least 48 hours in advance.

During the progress of the work, the Contractor shall cooperate with the Owners of the utilities and permit their representative's access to the work to determine if their utilities are being endangered in any way.

The Contractor shall schedule his construction so as to allow for a coordinated highway and utility effort. Upon award, the Contractor shall notify all utilities relative to the anticipated construction start date. Immediately following the Pre-construction Conference, the Contractor shall initiate any survey layout required for utilities.

# **Remedial Action Work Plan**

Natick Bridge No. 383  
Warwick/West Warwick, Rhode Island

August 17, 2011  
(Revised January 23, 2012)

Submitted to:

Rhode Island Department of Environmental Management

By:

Rhode Island Department of Transportation

# **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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## **TABLE OF CONTENTS**

1.0	Introduction.....	1
2.0	Site Description.....	2
2.1	General Description .....	2
2.2	Site Drainage.....	2
2.3	Land Uses and Potential Receptors.....	2
3.0	Remedial Objectives .....	4
3.1	Description of Impacted Media .....	5
3.2	Soil Objectives .....	6
3.3	Groundwater Objectives .....	7
3.4	Surface Water and Sediment Objectives.....	8
3.5	Air Objectives .....	8
4.0	Proposed Remedy .....	8
4.1	Soil Field Screening and Laboratory Analysis .....	10
4.2	Final Disposition of Impacted Media .....	11
5.0	Limited Design Investigation.....	13
6.0	Points of Compliance.....	13
7.0	Schedule.....	14
8.0	Contractor/Consultant .....	14
8.1	Contractor Responsibilities.....	14
8.2	Consultant Responsibilities.....	15
9.0	Site Plan .....	15
10.0	Technical Specifications .....	15
11.0	Set-up Plans .....	16
12.0	Effluent Disposal .....	16
13.0	Contingency Plan .....	17
14.0	Operating Log .....	17
15.0	Security Procedures .....	17

# **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

---

16.0	Shut-Down, Closure and Post-Closure Requirements .....	17
17.0	Institutional Controls and Notices .....	18
18.0	Compliance Determination .....	18
19.0	Certifications.....	19

## **List of Figures**

<b>Figure 1</b>	Locus Map
<b>Figure 2</b>	Site Plan
<b>Figure 3</b>	Source Area Plan
<b>Figure 4</b>	Proposed Longitudinal Section
<b>Figure 5</b>	RAWP Site Plan

## **List of Appendices**

<b>Appendix A</b>	August 12, 2011 Remedial Decision Letter
<b>Appendix B</b>	March 26, 2010 Notification of Release
<b>Appendix C</b>	February 17, 2011 Program Letter
<b>Appendix D</b>	Contract Design Plans
<b>Appendix E</b>	Contract Specifications
<b>Appendix F</b>	Operating Log
<b>Appendix G</b>	March 25, 2011 Public Notice

# **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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## **1.0 Introduction**

AECOM has prepared this Remedial Action Work Plan (RAWP) on behalf of the Rhode Island Department of Transportation (RIDOT) in response to a Remedial Decision Letter issued by the Rhode Island Department of Environmental Management (RIDEM) on August 12, 2011 (Case Number 2011-007). The letter, a copy of which is provided in Appendix A, serves as approval of a Site Investigation Report (SIR) submitted to RIDEM on November 17, 2010 to address the discovery of contaminated soil adjacent to the Natick Bridge in Warwick/West Warwick, Rhode Island as shown on Figure 1 – Locus Map.

The initial investigation was conducted at the request of RIDOT to ascertain current site conditions for the proposed replacement and roadway improvements associated with Natick Bridge No. 383 in Warwick/West Warwick, RI. The construction/bridge work will occur within the riverbed of the Pawtuxet River as well as within properties identified as 25 River Street and 775 East Avenue located along the banks of the Pawtuxet River and adjacent to the existing Natick Bridge (herein after referred to as “Site”). AECOM conducted the investigation and subsequent reporting consistent with the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations, DEM-DSR-01-93)* dated 31 March 1993, as amended August 1996 and February 2004, hereinafter referred to as Remediation Regulations.

During the initial investigation, AECOM discovered that soil at the Site is impacted with contamination from metals and trace levels of semi-volatile organic compounds (SVOCs), above applicable RIDEM Residential Criteria. In addition, beryllium and arsenic were detected at levels above RIDEM Industrial/Commercial Criteria. Groundwater at the site is not impacted. A Release Notification Form (RNF) was submitted to RIDEM on March 26, 2010. A copy of the RNF is provided in Appendix B. Subsequent to submitting the RNF, AECOM prepared and submitted a Site Investigation Report consistent with the Remediation Regulations. As noted above, the SIR was approved by RIDEM through their Remedial Decision Letter dated August 12, 2011.

The Site Investigation Report presented Remedial Alternatives to address the soil contamination at the Site. RIDEM issued a Program Letter, dated February 17, 2011, acknowledging the Preferred Alternative identified in the SIR. The Program Letter states that “the Preferred Remedial Alternative for contamination located at 25 River Street (Map Plat 40, Lot 371) in West Warwick proposes excavation and disposal of all contaminated soil in excess of Method 1 Residential Direct Exposure Criteria pursuant to the Remediation Regulations.” The Program Letter is included as Appendix C.

This RAWP describes the actions that are required to implement the Preferred Remedial Alternative, to support the proposed construction, consistent with the Remediation Regulations.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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### **2.0 Site Description**

This Remedial Action Work Plan will be implemented within properties identified as 25 River Street and 775 East Avenue located along the banks of the Pawtuxet River and adjacent to the existing Natick Bridge (herein after referred to as “Site”). See Figure 2 – Site Plan. The geographical location for the Site is described as follows (NAD 83 datum):

UTM Coordinates: 4,733,011.0 m N  
296,170.0 m E

Latitude/Longitude: 41° 43’ 21.2” N  
71° 29’ 22.2” W

### **2.1 General Description**

According to Rhode Island Geographic Information Systems (GIS) records, the Site is zoned as High Density Residential Areas to the north of Natick Bridge and Medium High Density Residential Area to the south of Natick Bridge. Groundwater is classified as GB – non potential drinking water source, as assigned by Rhode Island Department of Environmental Management (RIDEM). The Site is located in the Pawtuxet River Basin and crosses the Pawtuxet River. A waste disposal/junkyard property is located immediately northeast of the north abutment of the Natick Bridge.

The Pawtuxet River bank is steep from the edge of abutting properties to the water level. The bank is approximately 4 feet below existing ground level.

The existing roadway elevation of the Site ranges from 38.6 at the north abutment to 41.1 at the south abutment. Referenced elevations are above Mean Sea Level (MSL).

No wastes or hazardous materials are generated, handled, or stored on-site and there is no history of releases, spills, or leaks of such materials on-site.

### **2.2 Site Drainage**

Stormwater runoff on East Avenue is directed from the roadway into a series of catch basins that connect to an outfall pipe through the retaining wall along the southerly side of the Pawtuxet River on the east side of the bridge.

### **2.3 Land Uses and Potential Receptors**

The following table contains the address, ownership, and land use information for properties abutting and surrounding the Site.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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<b>Address</b>	<b>Owner</b>	<b>Land Use</b>	<b>Location</b>	<b>Map-Lot Number</b>
25 River Street West Warwick, RI	Anna Reali	Residential	Abuts bridge on east side of northern approach	AP 40, Lot 371
River Street West Warwick, RI	Bernard Petrarca	Residential	Abuts ridge on west side of northern approach	AP 40, Lot 48
Canna Street West Warwick, RI	Anna Reali	Industrial	Abuts Site on east of 25 River Street	AP 40, Lot 365
775 East Avenue Warwick, RI	Robert, Dennis & Kenneth Rossi	Residential	Abuts bridge on east side of southern approach	AP 263, Lot 1
779 East Avenue Warwick, RI	Christopher & Diana Lumpkin	Residential	Abuts Site on west of 775 East Avenue	AP 262, Lot 119
769 East Avenue	Kenneth Petrucci	Residential	Abuts Site on east side of bridge	AP 263, Lot 2

Rhode Island GIS record sources were consulted to identify natural resource areas within 500 feet of the Site, including surface waters, protected drinking water supply sources, sole source aquifers, protected open space, fish habitats, and habitats of Species of Special Concern or Threatened or Endangered Species. The Site does not lie within a wellhead protection area, potentially productive aquifer, sole source aquifer, or a groundwater recharge zone or groundwater reservoir. No private water supply wells were identified at or within 1-mile of the Site. Surrounding properties are supplied with public water by the City of Warwick's drinking water supply line system.

The nearest residences are located along East Avenue and River Street, immediately adjacent to the bridge. An automotive junkyard is located adjacent to the Site on the eastern edge. Three residences are located on the Site, as these properties are required for construction of the bridge.

There is one (1) area within a ¼ mile radius of the Site designated as Protected Open Spaces. This area is a ball field located at the end of Railroad Row, southeast of the Site. There are no institutions or historic sites within ¼ mile of the Site.

The only wetland resource area located within ¼ mile of the Site is the Pawtuxet River and its associated bank. Rhode Island Fresh Water Wetlands Act – River Bank wetlands Regulations has jurisdiction over the area that lies within 200-feet of the edge of the river. To the best of our knowledge, there are no known fish habitats or species of special concern or threatened or endangered species that exist within the proximity of the Site.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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The nearest surface waters are Pawtuxet River, located within the Site and approximately 40 feet from the nearest residence. No other significant surface water features were identified in the vicinity of the Site.

### **3.0 Remedial Objectives**

In accordance with the Rhode Island Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (#DEM-DSR-01-93), dated March 31, 1993, as amended August 1996 and February 2004 (the “Remediation Regulations”), the proposed remedy for a Site must satisfy various remedial objectives in order to manage any potential short-term risks to human health and the environment. The proposed remedial strategy for the Site meets all of RIDEMs Remedial Objectives, as described below:

- *The remedial objective for each carcinogenic substance does not exceed a  $1 \times 10^{-6}$  excess lifetime cancer risk level and the cumulative excess lifetime cancer risk posed by the contaminated-site does not exceed  $1 \times 10^{-5}$ ;*

No person at the Site will be exposed to a substance which could result in an excess lifetime cancer risk because of the long-term remediation goals and safety precautions during implementation of the remedial alternatives.

- *The remedial objective for each non-carcinogenic substance does not exceed a hazard index of 1 and the cumulative hazard index posed by the contaminated-site does not exceed 1 for any target organ;*

Based on the findings of the Site Investigation, the Site does not pose a significant non-cancer health risk due to the presence of one or more hazardous substances with similar modes of toxic action.

- *The remedial objective will not significantly contribute to adverse effects to any environmentally sensitive areas at or in the vicinity of the contaminated-site;*

The planned remedial actions for the Site will involve the excavation and disposal of impacted soil to support the construction of a new bridge across the Pawtuxet River. The Pawtuxet River is an environmentally sensitive receptor and will be protected with haybales/silt fence during all construction excavation activities. The excavation of contaminated soils will prevent migration of contaminants into the River in order to satisfy this objective.

- *The remedial objective will be protective of the natural resources of the State, including but not limited to groundwater;*

Groundwater at the Site is not impacted with contamination. The planned remedial actions to remove the soil contamination will prevent any leaching of contaminants into the groundwater and adjacent Pawtuxet River.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- *The remedial objective shall address the requirements of Rule 8.07 (Upper Concentration Limits).*

The site investigations performed to date did not result in identifying any contamination at the Site in excess of Upper Concentration Limits (UCL). Therefore, the current Site is in compliance with Rule 8.07. During construction, if non-aqueous phase liquids are encountered, the free product will be appropriately handled and the soil containing the product will be stockpiled separately for offsite disposal. Any soil removed during excavation that exceeds the UCL for Total Petroleum Hydrocarbons (TPH) or any hazardous substance will be appropriately analyzed and classified for disposal.

### **3.1 Description of Impacted Media**

A number of inorganic/metals were detected in all samples submitted for laboratory analysis, while one sample (B-3) contained trace concentrations of Semi-Volatile Organic Compounds (SVOCs). Groundwater at the Site is not impacted.

RIDEM Method 1 Residential direct exposure criteria was exceeded for:

- Benzo(a)pyrene (B-3 9-11', 0.690 pm)
- Chrysene (B-3 9-11', 0.7 ppm)
- Arsenic (B-3 9-11', 33.4 ppm)
- Beryllium (B-1 0-2', 1.75 ppm; B-3 9-11', 1.12 ppm; B-7 0-2', 0.683 ppm; B-7 15-16', 0.483 ppm)
- Lead (B-3 9-11', 209 ppm)

RIDEM Method 1 Industrial/Commercial Direct Exposure Criteria was exceeded for:

- Arsenic (B-3, 33.4 ppm)
- Beryllium (B-1, 1.75 ppm; B-3, 1.12 ppm)

No samples exceeded the Method 1 Upper Concentration Limits. No Volatile Organic Compounds (VOC) were detected in any of the samples.

The estimated areal extent of soil contamination at the Site is depicted in Figure 3 – Source Area Plan. This area is estimated to encompass approximately 3,000 square feet. Based on the laboratory analytical results and field and headspace observations, the vertical extent of reportable contamination appears to be confined to soils ranging from 8 to 11 feet below grade. Due to the lower permeability and saturated nature of the fine silt, this horizon appears to act as a semi-confining layer limiting the vertical extent of contamination.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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The total volume of impacted soil at the Site is estimated to be 33,000 cubic feet or 1,200 cubic yards.

### **3.2 Soil Objectives**

Soil at the Site is designated as Residential because the area is occupied by residences and is immediately adjacent to the Pawtuxet River. The future use of the site will be Industrial/Commercial because the area will be used as a highway approach for a new bridge and because the activities at the Site are not traditional residential activities as defined by the Remediation Regulations.

The Site will be remediated in a manner which meets the direct exposure and leachability criterion for each hazardous substance established in Rule 8.02.B (Method 1 Soil Objectives). The impacted material will be removed and disposed at an approved landfill while the remaining soil at the Site will comply with the Method 1 Direct Exposure and Leachability Criterion.

It is anticipated that the proposed remedial actions will remove contaminated soil to comply with the Residential Direct Exposure Criterion throughout the vadose zone. The proposed remedial actions comply with the General Requirements for Soil Objectives, identified in Rule 8.02.B, as summarized below:

- *With respect to any hazardous substance in soil at a contaminated-site, the Director may approve the application of a direct exposure criterion provided it is demonstrated to the satisfaction of the Director that the application of such direct exposure criterion at the contaminated-site will be protective of current and reasonably foreseeable future human exposure.*

Application of the Method 1 Soil Objectives at this Site will ensure that contamination is removed and the Site achieves compliance to be protective of current and future human exposure. Since the proposed use of the property is a highway approach for a new bridge, human exposure is very unlikely after construction. Construction workers will be protected with appropriate personal protective equipment and a Health and Safety Plan (HASP) during construction activities.

- *Regardless of the method employed for determining the direct exposure criterion, the residential direct exposure criterion shall be applied throughout the vadose zone for each hazardous substance in soil, except as otherwise provided in this Rule.*

All soils at the Site will be removed so that soil at the Site is in compliance with the Method 1 Soil Objectives.

The RIDEM GB Leachability Criterion will be applied at the Site for each hazardous substance in soil throughout the vadose zone for the following reasons:

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- *The GB groundwater objective is applicable to the groundwater of concern underlying and downgradient of the contaminated-site in accordance with Rule 8.03 (Groundwater Objectives); and*

The GB Groundwater Objective is applicable since the groundwater underlying and downgradient of the Site is not designated for use as a current or potential source of drinking water.

- *The application of the GB leachability criterion will not contribute to actual or potential impacts to surface water and/or sediments as described in the policies and regulations of the Division of Water Resources.*

The GB Leachability Criterion is applicable since the compounds detected at the Site are generally insoluble and will not affect the surrounding surface waters and/or sediments.

Based on the information presented above, the Soil Objectives at the Site will be consistent with RIDEM Method 1 Residential Direct Exposure Criterion and the GB Leachability Criterion, as verified by appropriate Toxicity Characteristics Leaching Protocol (TCLP) analysis.

The Soil Objectives for TPH shall be applied to the Site in conjunction with the soil objectives for all other hazardous substances as described above. During the Site Investigation, no soil was encountered that was contaminated with TPH above Method 1 Residential Direct Exposure Criteria. During construction and subsequent post excavation sampling, the applicable Method 1 Direct Exposure Criteria will be utilized, as summarized below.

- The Method 1 Residential TPH Direct Exposure Criterion shall be 500 ppm;
- The Method 1 Industrial/Commercial TPH Direct Exposure Criterion shall be 2500 ppm;
- The Method 1 GB TPH Leachability criterion shall be 2500 ppm.

### **3.3 Groundwater Objectives**

Groundwater at the Site is designated as “GB” since groundwater underlying and downgradient of the Site is not classified as a current or potential source of drinking water. Groundwater at the Site has not been impacted; nor is it anticipated that contaminated groundwater will be encountered during construction activities. Therefore, the Site is in compliance with the Groundwater Objectives. Groundwater will be sampled and analyzed as needed to support dewatering activities. If contaminated groundwater is encountered, RIDEM will be immediately notified and the groundwater will be treated and disposed of in accordance with applicable rules and regulations.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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### **3.4 Surface Water and Sediment Objectives**

No surface water or sediment impacts were identified during the Site Investigation. Therefore, the Site is in compliance with Surface Water and Sediment Objectives.

### **3.5 Air Objectives**

VOCs in ambient air were not detected during the course of the Site Investigation. Although VOC concentrations measured during headspace soil screening exceeded background in some soil samples, none of the readings were at high enough concentrations to partition to air in sufficient quantities to no adversely impact ambient air quality.

Ambient air monitoring will be performed with an OVM at all times during execution of the RAWP. If VOC concentrations exceed background conditions at the Site during the remedial activities, all work will be suspended until the source and nature of the VOC detections are identified. In addition, a HASP will be prepared for the RAWP which will detail the personal protective equipment necessary for working in this condition. If excessive airborne dust is observed during the remedial activities, then dust control measures will be employed. These measures may include the periodic wetting of exposed un-vegetated excavation surfaces.

### **4.0 Proposed Remedy**

As presented in the Site Investigation Report, AECOM evaluated two remedial alternatives to address the presence of elevated levels of Polycyclic Aromatic Hydrocarbons (PAHs) and metals in soil at the Site. The proposed remedial alternative primarily consists of excavation and disposal of soils, as this would be needed to support the proposed construction. This work will occur within the limits of the Site, depicted on Figure 3 – Source Area Plan

In order to satisfy the project goals and objectives – construct a new bridge across the Pawtuxet River – RIDOT will require excavation on both sides of the river to construct new abutments and roadway approaches. This construction will require the removal of over 5,600 cubic yards of material, some of which is impacted by contamination as described in previous sections of this report. In all, RIDOT proposes to excavate 5,600 cubic yards of material as part of this project, identified from the following sources of excavation:

- North abutment footing: 300 cy
- North approach foundations: 150 cy
- Existing north approach demolition: 2,000 cy, including all roadway approaches
- South abutment footing: 250 cy
- South approach foundations: 200 cy

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- Existing south approach demolition: 2,700 cy

As shown on Figure 3 the Source Area is identified as 25 River Street, the location of the proposed north abutment of the new Natick Bridge. The bridge structure consists of drilled caissons to 35-feet below grade, with footings on top of the caissons and then the bridge abutments and driving surface. The footings are installed to depths of 10-feet below grade, requiring an open cut area of approximately 56-feet long by 5-feet wide. Figure 4 – Proposed Longitudinal Section shows the typical section of the bridge, with proposed elevations for foundation structures that require excavation. The final design plans and specifications for this construction are included in Appendix D and E, respectively.

In order to construct the new abutments and bridge, the existing bridge will be demolished and the existing abutments will be excavated and backfilled with rip rap. Excavation work at the existing north abutment will be subject to compliance with this RAWP, as it is within the Source Area. See Construction Plan 45 for limits of demolition.

The anticipated construction phasing and sequencing consists of the following, as detailed in Construction Plans 51 through 55:

- Install temporary containment barriers/erosion control at proposed north approach
- Install temporary earth support at north approach
- Excavate and construct north abutment foundations and center pier (in water)
- Install temporary containment barriers/erosion control at proposed south approach
- Install temporary earth support at south approach
- Excavate and construct south abutment foundations
- Install new bridge deck
- Demolish existing bridge
- Install rip rap and landscaping

It is estimated that approximately 5,600 cubic yards of material will be removed and disposed to complete this construction. Of the total volume of excavated material it is estimated that 1,200 cubic yards is impacted with contamination above Method 1 Residential Direct Exposure Criteria. All material will be removed, transported, and disposed off-site at either Central Landfill in Johnston, Rhode Island or Turnkey Landfill in Rochester, New Hampshire. The material will be transported and disposed in accordance with all applicable federal, state, and local solid and hazardous waste laws and regulations.

Prior to constructing the abutments and placing backfill, post-excavation sampling of soil will verify that all impacted material has been removed in accordance with this RAWP. Anticipated analyses of post-excavation samples are discussed in Section 4.1.

The excavation of impacted soil will effectively remove the contamination at the Site, and will therefore achieve the Remedial Objectives outlined in this plan. In addition, the following Best Management Practices, from Section 9.03, will be implemented to address RIDEM concerns associated with removing impacted media:

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- *Prevent the infiltration/migration of hazardous substances at levels harmful to human health or the environment;*

Based on the Site Investigation, the Site is contaminated with metals and arsenic that are generally insoluble and not likely to migrate. If further oil or other hazardous materials (OHM) impacts are identified during the remedial activities, the source and nature of the contamination will be assessed and removed in accordance with this plan. This may require a modification of the RAWP which will be submitted to RIDEM.

- *Prevent direct contact with hazardous substances at levels harmful to human health and the environment;*

An Environmental Field Technician will be on-site to observe all remedial activities performed at the Site. This person will observe whether the contractor is in compliance with the Health and Safety Plan and has the appropriate personal protective equipment, as specified in the Health and Safety Plan, to adequately perform the remedial activities without coming in direct contact with any potentially contaminated soils. If additional impacts are identified during the remedial activities, the site personnel will be required to upgrade the level of personal protective equipment so as to avoid direct contact with the impacted soil.

- *Eliminate volatilization and entrainment of hazardous substances; and*

The proposed remedy will remove all impacted soil at the Site within the Source Area. Excavated soil will be stockpiled and covered to eliminate entrainment of hazardous substances.

- *Minimize and manage surface runoff from the area including during the remedial action.*

The design plans require sedimentation and erosion control barriers, as appropriate, to manage stormwater runoff at the Site. The design plans also establish responsibilities for preparing and maintaining the excavated soil stockpile area with an appropriate erosion control barrier and plastic sheeting to prevent migration of potential contaminants from the soil. The excavated soil stockpile will be located downgradient of the Site and will be protected and separated from non-contaminated areas with adequate physical barriers such as a continuous line of jersey barriers.

### **4.1 Soil Field Screening and Laboratory Analysis**

All soils excavated from the Site will be inspected by visual and olfactory means to ascertain the presence of staining or odors from possible OHM impacts. Any soil exhibiting OHM impacts will be field screened utilizing headspace procedures and field analyzed for the presence of TPH and PAHs. At a minimum, one VOC headspace screening sample will be collected for every 100 cy of soil excavated. A composite

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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sample will be collected from every 100 cy of soil excavated for TPH and PAH field analysis. VOC headspace analysis will be performed utilizing a Photoionization Detection (PID) with a 10.3 eV lamp or higher if necessary. Field analysis for TPH will be performed utilizing the PetroFLAG Hydrocarbon Test Kit, equivalent to EPA SW-846 Method Number 9074. Field analysis for PAHs will be performed utilizing the EnviroGard PAH in Soil Test Kit, equivalent to EPA SW-846 Method Number 4035. If any of these field screening and analysis methods demonstrate OHM impacts to soil approaching or exceeding RIDEM Method 1 Criteria, the soil will be appropriately segregated in the designated stockpile area.

Soil samples will be collected for disposal characterization at a frequency of approximately one for every 500 cubic yards of material excavated. Post-excavation soil samples will be collected in accordance with Section 6.0 of this plan. All samples will be sent to a State certified and RIDEM approved laboratory for analysis. At a minimum, any sample sent to a laboratory will be analyzed by the following methods and in accordance with the Rhode Island Remediation Regulations and applicable EPA Standards:

- Semi-Volatile Organic Compounds (SVOCs) – EPA Method 8270
- Volatile Organic Compounds (VOCs) – EPA Method 8260
- Total Metals (RCRA 8 Metals) – EPA Methods identified in Rhode Island Remediation Regulations Appendix B
- Total Petroleum Hydrocarbons (TPH) – EPA Method 418.1 or approved equal

Additional analyses may be performed to meet the requirements of a receiving facility for disposal. All potentially contaminated soils will be stockpiled at an interim storage area as shown on the design plans, included as Appendix D.

### **4.2 Final Disposition of Impacted Media**

Based on the information collected during the Site Investigation, the following materials are expected to be encountered during excavation and dewatering activities:

- Non-Contaminated Soil: All soil excavated and stockpiled that is found to meet the Residential Direct Expose Criteria will be removed and properly disposed off-site.
- Contaminated Soils (Type 1B): All soil meeting with Alternative Daily Cover Criteria of the Rhode Island Resource Recovery Corporation (RIRRC) will be disposed at the RIRRC Landfill in Johnston, Rhode Island, in accordance with all RIDEM regulations for disposal of these materials. All handling and disposal of these materials will conform to applicable RIDEM requirements for handling, storage, transporting, and disposal of petroleum products or contaminated waste materials.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- Contaminated Soils (Type 2): All soil excavated and stockpiled found not to meet the criteria of Non-Contaminated Soils and Contaminated Soils (A) shall be disposed of as solid waste. Solid Waste Material will be disposed of at the RIRRC Landfill or at the Turnkey Landfill in Rochester, New Hampshire, in accordance with all U.S. Environmental Protection Agency and RIDEM regulations for disposal of these materials. All handling and disposal of these materials will conform to applicable EPA and RIDEM requirements for handling, storage, transporting, and disposal of solid waste materials.
- Water: All dewatering fluids will be removed and properly disposed off site. Containerized dewatering fluids shall be sampled and tested in accordance with the specified off-site treatment facility requirements. It is anticipated that water will be sampled and analyzed for:
  - Semi-Volatile Organic Compounds (SVOCs) - EPA Method 8270
  - Total Metals (RCRA 8 Metals) - EPA Methods identified in Rhode Island Remediation Regulations Appendix B
  - Total Petroleum Hydrocarbon (TPH) - EPA Method 418.1 or approved equal
  - Volatile Organic Compounds (VOCs) – EPA Method 8260b.

Alternatively, the disposal facility may accept the water based on the results of extensive groundwater sampling conducted to date. A waste profile for the fluids will be prepared for approval and acceptance by the disposal facility. The waste profile will determine whether the fluid is a State or Federal Hazardous waste.

The Contractor will prepare manifests and/or other shipping records as required by the State of Rhode Island and the receiving facility's home state. Transport shall not be initiated until the receiving facility has issued written acceptance of the containerized fluid. The transport vehicle and transport company shall be licensed or otherwise approved to transport such fluids by its home state or by the State of Rhode Island.

Transfer of fluids from container to transport vehicle shall be accomplished using vacuum procedures or other methods that will minimize the likelihood of spills onsite. Fluids shall be transported directly to the treatment facility. Transfer to another vehicle or interim storage off-site will be prohibited. Facility receipts, signed copies of manifests and/or weight slips, providing proof of disposal, shall be provided to the Engineer within 30 days of transport from the site.

Solids associated with the contained fluids shall be removed from the containers, sampled and tested in accordance with the specified off-site disposal facility requirements. These solids may be profiled and disposed of along with stockpiled soil or may be profiled and disposed of separately in accordance with procedures described for soil disposal.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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All impacted solids or liquids which are removed for off-site disposal will comply with all applicable US DOT packaging, labeling, marking, and shipping requirements per 40 CFR 273.18 or 40 CFR 273.38 prior to offsite shipment. In addition, all impacted solids or liquids which are removed for off-site disposal will comply with all applicable US EPA and RIDEM regulations for handling, storage, transporting, disposal, and documentation including manifests, weight slips, and bill of ladings.

If determined to be hazardous waste, solids or liquids transported from the site will be conveyed with appropriate Rhode Island Uniform Hazardous Waste Manifest. All hazardous waste manifests will be retained by RIDOT and included in the Operating Log, per Section 13.0 of this plan, for submission to RIDEM.

All Universal Waste transported from the Site will comply with the requirements of 40 CFR 273 Subpart D and Rule 13 of the Hazardous Waste Regulations.

All documentation including, but not limited to, Hazardous Waste Manifests and Solid Waste receipts, will be submitted to RIDEM as part of the records used to demonstrate site compliance and implementation and operation of the proposed remedial action.

### **5.0 Limited Design Investigation**

A limited design investigation has not been prepared as part of this RAWP.

### **6.0 Points of Compliance**

Pursuant with Rule 8.08 of the Remediation Regulations, Points of Compliance at the Site will be required to verify that the remedy has achieved the remedial objectives as outlined in Section 3.0 of this plan. Points of Compliance have been established for soil objectives, as specified in Section 8.02 of the Remediation Regulations. For the purpose of this section, base is defined as the bottom of the excavation for the footing construction (10-feet below grade) and for caisson installation (35-feet below grade).

Points of Compliance will be established during the soil excavation consistent with the RIDEM Marginal Risk Site Policy, dated January 29, 2002. In accordance with Section B.4 of the Policy, confirmatory sampling will include 1 sample per 25-feet of sidewall, 1 sample every 5-foot of wall height and one bottom sample every 625 square feet. Based on the proposed design of the bridge, the following confirmatory sampling is proposed:

- Caissons are installed to depth of 35' that will support bridge footings. Since contamination at the Site was not discovered at depths greater than 11' below grade, collect 1 base sample per caisson.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- Bridge footings are installed on top of the caissons to a depth of 10' below grade. Footings will be installed in an open cut fashion of approximately 56' long by 5' wide. Collect 2 sidewall samples, 2 samples along the height of the area and 1 base sample.

The samples will be analyzed to ensure that the soil objectives outlined in this plan are met. Alternatively, in areas where the base samples continue to exhibit OHM levels above Method 1 industrial/Commercial criteria, excavation will continue and new base samples will be collected to verify compliance.

Since there was no groundwater, surface water or sediment impacts identified during the Site Investigation, no Points of Compliance have been established for these media. Additional details concerning compliance determination methodology is included in Section 18.0 – Compliance Determination.

### **7.0 Schedule**

The proposed remedial actions are scheduled to begin in the summer 2011, immediately upon approval of this RAWP. RIDOT would like to complete the construction as soon as possible. It is estimated that the construction will last about xx months, including post excavation sampling.

A final schedule will be developed by the Contractor and submitted to RIDEM for review prior to beginning any remedial activities at the Site.

### **8.0 Contractor/Consultant**

The remedial activities described in this report will be performed by a Contractor, and their authorized subcontractors, hired by RIDOT (herein referred to as “Contractor”). The Consultant overseeing the remedial activities will be AECOM. The following sections outline the remedial activity responsibilities of both the Contractor and Consultant.

#### **8.1 Contractor Responsibilities**

The Contractor and its authorized subcontractors will be responsible for the following activities related to this RAWP:

- Develop a site-specific Health and Safety Plan;
- Excavate and stockpile soils as directed by the Consultant;
- Transport and dispose of soils at an approved landfill, as directed by the Consultant; and
- Prepare appropriate Manifests and Bills of Lading for transport and disposal of soil and groundwater.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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### **8.2 Consultant Responsibilities**

AECOM will be responsible for performing or coordinating the following activities related to this RAWP:

- Field screening of soil for segregation in the stockpile area;
- Laboratory analysis of post excavation soil samples;
- Maintenance of an Operating Log;
- Preparation of progress reports related to the remedial activities;
- Preparation of applicable close out reports;
- Interface with RIDOT and RIDEM; and
- Oversee all activities of the Contractor and their subcontractors.

RIDEM will be notified in writing prior to commencing any remedial activities at the Site.

### **9.0 Site Plan**

A RAWP Site Plan is included as Figure 5. The Site Plan contains the following information:

- Location of Site Investigation borings and monitoring wells;
- Limits of excavation for the proposed remedy;
- Location of proposed monitoring points during remedial activities; and
- Location of Points of Compliance.

This Site Plan is a compilation of contract drawings prepared by a Rhode Island Registered Professional Engineer and information contained in the Site Investigation Report.

### **10.0 Technical Specifications**

The design standards and technical specifications for this RAWP are included in contract documents that were developed for the Rhode Island Department of Transportation – Bridge Replacement: Natick Bridge No. 383 Project. The specifications are a compilation of the RIDOT Standard Specification for Road and Bridge Construction (1997 Edition) and AECOM supplemental information, which specifically identify the nature of the work to be performed and the materials and equipment to be used for the remedial activities.

A Rhode Island Registered Professional Engineer prepared the specifications with the assistance of AECOM personnel who prepared his RAWP. A copy of the relevant specifications from the contract documents is included in Appendix E.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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### **11.0 Set-up Plans**

As part of the RIDOT Natick Bridge contract documents and this RAWP, the Contractor will be required to create a stockpile area and install an appropriate sediment and erosion control system prior to the start of the remedial actions. The limits of the stockpile area and erosion control system are shown on the attached design plans, included as Appendix D. The stockpile area and erosion control system have been designed in accordance with best management practices in a manner that complies with all applicable laws, rules, and regulations. In general, the storage of excavated soil and extracted groundwater will be located downgradient of the Site, and migration of contaminants from this area will be addressed with adequate physical barriers such as jersey barriers and absorbent pads.

### **12.0 Effluent Disposal**

The disposal of material removed from the Site during implementation of the remedial activities is ultimately the Contractor's responsibility. The Contractor will be responsible for transporting the soil for disposal at either the RIRRC Landfill or the Turnkey Landfill. The Contractor will retain a subcontractor to pump the groundwater from the storage tanks and dispose of it at an approved facility.

In addition to the requirements previously mentioned, the Contractor will be required to comply with Rule 6.00 of the Hazardous Waste Regulations. Rule 6.01 of the Hazardous Waste Regulations requires a transporter of hazardous waste to obtain a Hazardous Waste Transporter Permit or temporary permit.

Any universal waste discovered during the remedial activities will be handled, transported, and disposed at an approved landfill pursuant to 40 CFR Parts 124, 270, 271.

The following is a list of applicable laws and regulations regarding effluent disposal for the planned remedial actions:

- 40 CFR Parts 260 through 273
- Rhode Island Department of Environmental Management, Office of Waste Management, Solid Waste Regulation No. 1, effective January 1997, as amended April 2001.
- Rhode Island Resource Recovery Corporations Alternative Daily Cover Requirements
- Rhode Island Rules and Regulations for Hazardous Waste Management, short title: "Hazardous Waste Regulations" (#DEM OWM-HW09-01), effective November 13, 2001

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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- Rhode Island Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, short title: “Remediation Regulations” (#DEM-DSR-01-93), dated March 31, 1993, as amended August 1996 and February 2004.
- Rhode Island Universal Waste Rule, June 2002.

### **13.0 Contingency Plan**

AECOM will develop a Contingency Plan that identifies the procedures to be followed and the persons to be notified in the event of an unexpected incident involving hazardous materials at the site. The following is a summary of the relevant information that will be included in the Contingency Plan:

- Emergency contact information for RIDOT, RIDEM, AECOM, and the contractor’s representative
- Emergency response procedures, including a spill prevention and control plan
- Description of the work practices to prevent ignition and/or reaction of potential compounds or materials at the Site.

The Contractor will be required to provide this information in its HASP. A copy of the Contingency Plan will be available at the Site at all times during the remedial activities.

### **14.0 Operating Log**

AECOM has developed and will maintain an Operating Log during implementation of the remedial activities. The Operating Log will be kept on file for a period of three (3) years after completion of the RAWP. A sample Operating Log is included in Appendix F. A copy of the Operating Log will be submitted to RIDEM concurrently with the required progress reports.

### **15.0 Security Procedures**

As described in Section 2.0 of this plan, the Site is owned by RIDOT and is only accessible to RIDOT agents. The Contractor is ultimately responsible for site security.

### **16.0 Shut-Down, Closure and Post-Closure Requirements**

The proposed remedy does not include any active “remediation units” and therefore does not require any specific shut-down or closure requirements. The post-closure requirements for the Site are explained in Section 18.0 – Compliance Determination, which describes the post-excavation sampling to ensure compliance with the stated remedial objectives.

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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### **17.0 Institutional Controls and Notices**

On March 25, 2011, RIDOT submitted a public notice to all abutting landowners informing them of the results of the Site Investigation Report and the proposed remedial activities to occur at the Site. A copy of the Notice is included in Appendix G. There are no institutional controls proposed at this time. However, in event that all contaminated soil is not removed consistent the proposed plan, RIDOT will record a DEM-approved Environmental Land Use Restriction and post-remediation Soils Management Plan.

### **18.0 Compliance Determination**

Described below are the procedures that will be employed in order to demonstrate that the remedial objectives for the Site have been met, in compliance with Rule 8.10 of the Remediation Regulations.

The frequency of post-excavation analytical laboratory confirmatory testing will, at a minimum, comply with RIDEM guidance, which stipulates that one sample be collected from every 50 square feet of excavation area by 5 feet of vertical depth (or approximately 463 cubic yards by volume) and one sample for every 2,500 square feet of excavation base. Field observations and sample headspace screening will be used to determine if additional OHM parameter analyses are warranted.

Samples collected at the proposed bottom of excavation elevations (base samples) will be used to ensure compliance with the Soil Objectives as outlined in the Rule 8.10 of the Remediation Regulations and Section 2.2 of this plan. If all base samples are found to be below target soil objectives (i.e. Method 1 Industrial/Commercial Direct Exposure Criteria), this portion of the Site may be considered in compliance with the Remediation Regulations, pending approval from RIDEM.

However, compliance assessment may require the collection of at least 20 or more post-excavation samples in order to apply a statistical analysis methodology. If 10% or less of the base samples exhibit OHM levels which do not exceed the Soil Objectives by a factor greater than 5, it may be possible to demonstrate that the “exposure point” average for the compounds of concern achieve compliance by utilizing the statistical methodology criteria as described in Rule 8.10.A.ii of the Remediation Regulations.

If more than 10% of the individual base samples exceed the Soil Objectives, or one or more base samples exhibit OHM levels that exceed the Soil Objectives by a factor greater than 5, it will not be possible to establish Site compliance unless additional excavation work is performed and/or alternative risk assessment methodologies are employed. In that case, Method 3 Remedial Objectives would be developed for the site due to the existence of upgradient OHM sources and the presence of a downgradient ecological receptor (Pawtuxet River). The establishment of Method 3 Remedial Objectives would require a site specific Human Health Risk Assessment and Ecological Risk Assessment Report. Furthermore, additional subsurface sampling of upgradient fill materials on the adjacent property would have to be performed in order to establish

## **Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

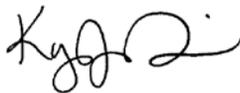
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“background” concentrations for soil. In cases where isolated OHM “hot spots” are identified, it may be more cost effective to simply over-excavate these materials and collect additional base samples to be used to achieve compliance by utilizing the statistical methodology criteria described above. Alternatively, if OHM levels are greater than one order of magnitude above selected Method 1 Industrial/Commercial criteria and the impacts appear to be widespread or approach UCLs, then it is likely that additional risk assessment methodologies would have to be employed.

For the purposes of initial base sample data review, “hot spots” will be defined as any location where analytical results exceed the Soil Objectives by a factor greater than 5. If it is necessary to over-excavate beyond the proposed elevation to achieve compliance, RIDOT will assess the relative benefits of removing any hot spots versus performing additional risk assessment necessary to modify Soil Objectives pursuant to the Remediation Regulations Rule 8.04 – Method 3 Remedial Objectives.

### **19.0 Certifications**

The following person(s) certify that the information contained in this Remedial Action Work Plan is accurate to the best of their knowledge.



\_\_\_\_\_  
Kyle Davis  
Environmental Engineer  
AECOM Technical Services, Inc.

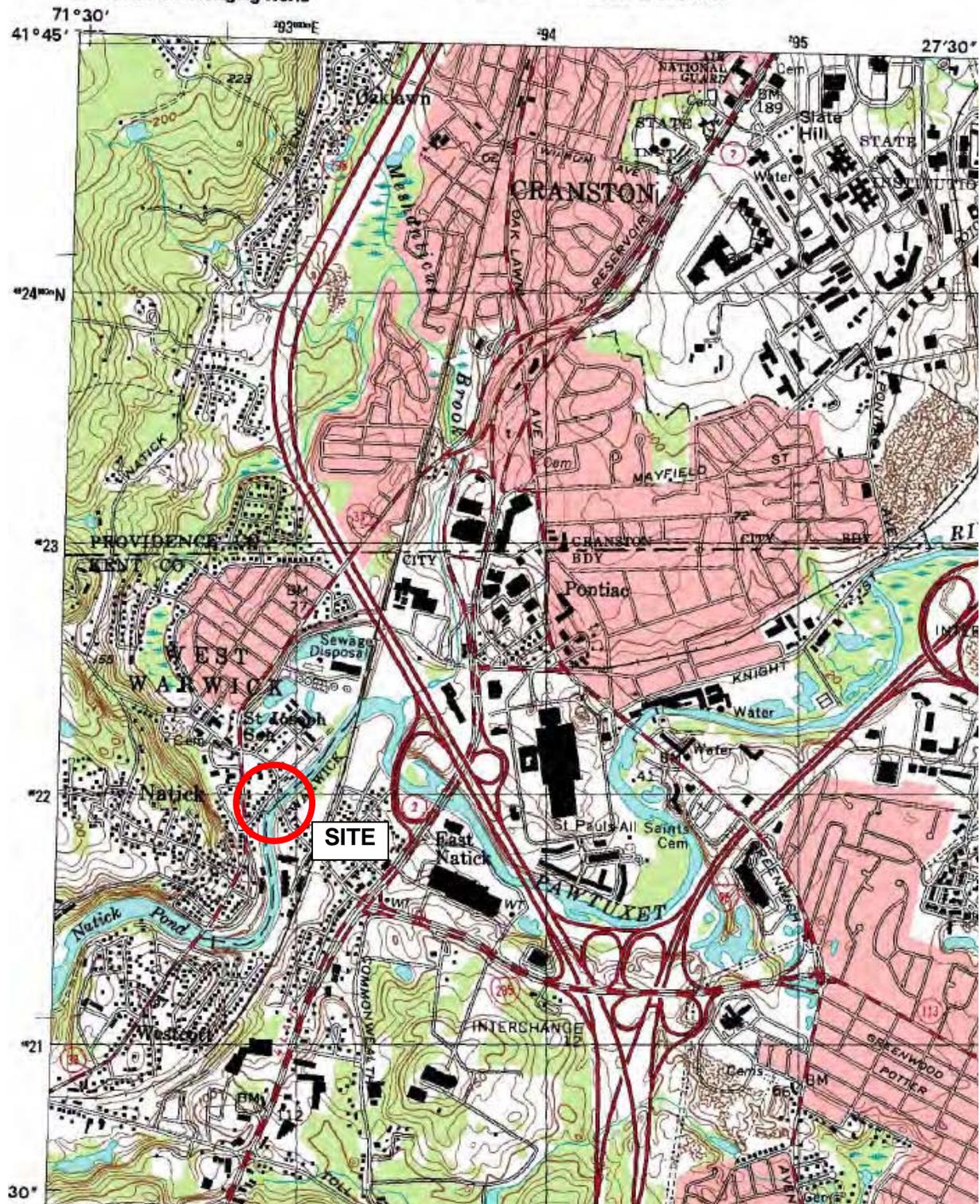
In addition, the following person(s) certify that this Remedial Action Work Plan is a complete and accurate representation of the contaminated-site and the release and contains all known facts surrounding the release to the best of their knowledge.

\_\_\_\_\_  
Peter A. Healy, P.E.  
Supervising Civil Engineer  
Environmental Resources & Highway Engineering  
Rhode Island Department of Transportation

**Figures**

**Remedial Action Work Plan**  
*Natick Bridge No. 383, Warwick/West Warwick, RI*

**Figure 1 – Locus Map**











**Appendix A**

August 12, 2011 Remedial Decision Letter



August 12, 2011

**REMEDIAL DECISION LETTER  
CASE # 2011-007**

Peter A. Healey, P.E.  
Acting Chief Civil Engineer  
Environmental Resources/Highway Engineering  
Rhode Island Department of Transportation  
Engineering Division  
Two Capitol Hill, Rm. 226  
Providence, RI 02903-1124

RE: **Natick Bridge #383-Map Plat 40, Lot 371 (25 River Street)** in West Warwick, Rhode Island

Dear Mr. Healey:

On February 24, 2004, the Rhode Island Department of Environmental Management (the Department; RIDEM OWM) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of sites in order to eliminate and/or control threats to human health and the environment in a timely and cost-effective manner. A Remedial Decision Letter (RDL) is a formal Department approval of a conceptual remedy proposed by the performing party as a result of the findings of the Site Investigation.

The Department has reviewed the following documents regarding the Site Investigation at the above-referenced site:

1. Lists containing names and addresses of Warwick and West Warwick residents to whom letters were sent regarding completion of the SIR. Submitted by RIDOT via email on August 10, 2011.
2. Public notice to abutters dated March 25, 2011 and submitted by RIDOT via email on April 18, 2011.
3. **Site Investigation Report (final), Natick Bridge No. 383, Warwick/West Warwick, Rhode Island**, prepared by AECOM and submitted by the Rhode Island Department of Transportation (RIDOT); dated November 17, 2010 and received December 8, 2010.

4. **Site Investigation Report, Natick Bridge No. 383, Warwick/West Warwick, Rhode Island**, prepared by AECOM and submitted by RIDOT; dated July 28, 2010 and received August 26, 2010.

Collectively, these documents define "Existing Contamination" at the Site and fulfill the requirements of a Site Investigation Report (SIR) as described in Section 7.08 of the Remediation Regulations. In addition, according to our records, public notice was conducted to all abutting property owners and tenants regarding the substantive findings of the completed investigation, in accordance with Rules 7.07 and 7.09 of the Remediation Regulations and the requirements of Rhode Island General Laws (R.I.G.L.) Title 23 Health and Safety, Chapter 23-19.14 Industrial Property Remediation and Reuse Act, Section 23-19.14-5 Environmental Equity and Public Participation. The opportunity for public review and comment on the technical feasibility of the proposed remedial alternative commenced on March 30, 2011, and the period closed on April 13, 2011. No comments were received regarding remedy selection.

**The preferred remedial alternative, as stated in the SIR, consists of the following conceptual measures: excavation and disposal of all contaminated soil in exceedance of the Method 1 Residential Direct Exposure Criteria pursuant to the Remediation Regulations.**

The Department hereby approves the SIR with the above identified preferred remedial alternative and requires that a Remedial Action Work Plan (RAWP) be submitted for review and approval and implemented to achieve the objectives of the environmental cleanup, in accordance with the following conditions:

1. In accordance with Sections 8.0 and 9.0 of the Remediation Regulations, a RAWP, along with a remediation Soil Management Plan (SMP), shall be submitted on or before **September 30, 2011** for Department review and approval. The RAWP shall describe all of the technical details, engineer design elements, and schedules associated with the implementation of the proposed remedy. All of the subsections outlined in Section 9.0 of the Remediation Regulations must be included in order to facilitate the review and approval of the RAWP. If an item is not applicable to this Site, simply state that it is not applicable and provide an explanation in the RAWP.
2. Once the Department reviews the RAWP for consistency with Sections 8.0 and 9.0 of the Remediation Regulations, any written comments generated and forwarded as a result of the review(s) shall be incorporated forthwith into a revised RAWP, to be re-submitted for final approval.
3. Upon finalization of the RAWP the Department will issue a Remedial Approval Letter (RAL) signifying Department approval. All remedial measures required by the Department shall be implemented, in accordance with the approved schedule, to ensure all applicable exposure pathways at the site are appropriately addressed.

Please be advised that the Department reserves the right to require additional actions under the aforementioned Remediation Regulations at the Property should any of the following occur:

- A. Conditions at the Site previously unknown to the Department are discovered;

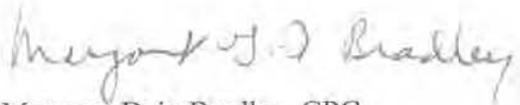
B. Information previously unknown to the Department becomes available;

C. Policy and/or regulatory requirements change; and/or

D. Failure by the RIDOT or any future holder of any interest in the Property to adhere to the terms and conditions of the Department approved RAWP, schedules, or RAL for the Property.

If you have any questions regarding this letter, please contact Margaret Bradley by telephone at (401) 222-2797 ext. 7105 or by email at [margaret.bradley@dem.ri.gov](mailto:margaret.bradley@dem.ri.gov).

Sincerely,



Margaret Dein Bradley, CPG  
Sr. Environmental Scientist  
Office of Waste Management

Authorized by:



Jeffrey Crawford  
Principal Environ. Scientist  
Office of Waste Management

cc. Kelly Owens, RIDEM OWM  
Erik Johnstone, RIDOT

**Appendix B**

March 26, 2010 Notification of Release



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation  
ENGINEERING DIVISION  
Two Capitol Hill, Rm. 226  
Providence, RI 02903-1124  
PHONE 401-222-2023  
FAX 401-222-3006; TDD 401-222-4971

March 26, 2010

Ms. Margaret Bradley  
Rhode Island Department of Environmental Management  
Office of Waste Management  
Division of Site Remediation  
235 Promenade Street  
Providence, Rhode Island 02908

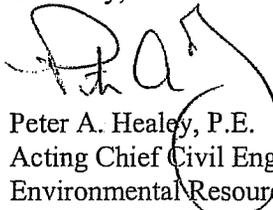
Re: Natick Bridge  
Hazardous Materials Release Notification  
Warwick & West Warwick, Rhode Island  
RIC No. 2001-EB-003

Dear Ms. Bradley:

The Rhode Island Department of Transportation (RIDOT) is submitting a Hazardous Materials Release Notification Form during investigation activities associated with the proposed replacement of the Natick Bridge in Warwick & West Warwick. According to the information provided, metals and semi-volatile organic compounds that are likely the result of historic land use were identified in samples collected from the area of proposed construction.

If you should have any questions or comments regarding this matter, please contact Erik Johnstone, Environmental Scientist, at 222-2023, Ext. 4289.

Sincerely,

  
Peter A. Healey, P.E.  
Acting Chief Civil Engineer  
Environmental Resources/Highway Engineering

STATE OF RHODE ISLAND  
DEPT OF TRANSPORTATION

MAR 29 2010

BRIDGE ENGINEERING DIVISION  
RECEIVED

Enclosures  
cc: Fish, Johnstone, Vittoria-Bertrand, Healey, File



Adjacent Groundwater Class: X GA/GAA  
(if different than site groundwater classification within 500 feet)

     GB

Nearest Surface Water or Wetland:

X Less Than 500 Feet                           Greater Than 500 Feet

Potential for adverse impact                      No Yes/No

5. Potentially Responsible Parties

Name: Historical land usage

Address: \_\_\_\_\_

Status:      Owner        Operator        Other: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Status:      Owner        Operator        Other: \_\_\_\_\_

6. Measures Taken or Proposed to be Taken in Response to Release

Prepare Site Investigation Report. Address contaminated soil during reconstruction

of Natick Bridge. Coordinate efforts with RIDEM.

\_\_\_\_\_

7. Other Significant Remarks About Release (Will a background determination be made?)

A background determination will be made to support the SIR.

\_\_\_\_\_

Signature: \_\_\_\_\_

Date      /      /     

Title: \_\_\_\_\_

## AECOM

66 Long Wharf, 2<sup>nd</sup> Floor, Boston, MA 02110  
T 617.723.1700 F 617.749.0947 www.aecom.com

## Memorandum

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Date: October 26, 2009  
To: Norm Orrall, Commonwealth Engineers & Consultants, Inc.  
From: Kyle Davis  
Subject: Natick Bridge No. 383 – Soil & Groundwater Sampling Results, Warwick, Rhode Island

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Distribution: R. Wright, File

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AECOM was retained by Commonwealth Engineers & Consultants, Inc. (CE&C) for the purpose of evaluating the current soil and groundwater conditions in the vicinity of the proposed Natick Bridge No. 383 in Warwick/West Warwick, Rhode Island. The construction/bridge work will occur within the riverbed of the Pawtuxet River as well as within properties identified as 25 River Street and 775 East Avenue located along the banks of the Pawtuxet River and adjacent to the existing Natick Bridge (the "Site"). This work was performed for CE&C on behalf of the Rhode Island Department of Transportation (RIDOT).

Previous Environmental Assessments conducted by CE&C<sup>1</sup> indicated that the Site does not have any on-going recognized environmental conditions; however, a generator of hazardous materials is located within the project area. Based on the Type Study prepared by CE&C, we understand that the construction work consists of:

- Excavation of soil to construct abutments on riverbank, pier within the river and roadway approaches from River Street and East Avenue
- Potential dewatering to construct abutments
- Construction of a new Natick Bridge
- Construction of new roadway approaches from River Street and East Avenue
- Removal of existing Natick Bridge and approach roadways outside the limits of new construction

AECOM conducted soil and groundwater sampling and analysis consistent with the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations, DEM-DSR-01-93)* dated 31 March 1993, as amended August 1996 and February 2004. This investigation was prompted by the recommendations included in the above-referenced Phase I Reports to characterize the soils and groundwater to facilitate construction of the new Natick Bridge.

The Site is bounded on the north by 25 River Street; on the east and west by the Pawtuxet River; and on the south by 775 East Avenue. See attached Figure 1 – Locus Map.

According to Rhode Island Geographic Information Systems (GIS) records, the Site is zoned as High Density Residential Areas to the north of Natick Bridge and Medium High Density Residential Area to the south of Natick Bridge. Groundwater is classified as GB – non potential drinking water source, as

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<sup>1</sup> *Phase I Assessment Hazardous Material/Waste – 775 East Avenue, Warwick, Rhode Island, October 11, 2002.*  
*Phase I Assessment Hazardous Material/Waste – 25 River Street, Warwick, Rhode Island, October 11, 2002*

assigned by Rhode Island Department of Environmental Management (RIDEM). The Site is located in the Pawtuxet River Basin and crosses the Pawtuxet River. A waste disposal/junkyard property is located immediately northeast of the north abutment of the Natick Bridge.

The existing roadway elevation of the Site ranges from 38.6 at the north abutment to 41.1 at the south abutment.

### Soil Sampling and Analytical Results

During May and June 2009, Commonwealth Engineers & Consultants (CE&C) installed borings and monitoring wells in accordance with the approved Boring Location Plan prepared by CE&C. AECOM was not present for the advancement of borings or installation of monitoring wells. Soil borings were advanced using standard hollow-stem auger to depths ranging from approximately 4 to 60 feet below grade. Soil samples were collected utilizing a 2-foot stainless steel split-spoon sampler. Soil samples were collected by CE&C field representatives. Boring logs were prepared by CE&C and are on file at their Smith Street Office. A copy of the boring logs are attached. Borings B-4 and B-7 were converted into monitoring wells as described in the next section.

AECOM received soil samples from CE&C on May 26, 2009 and June 11, 2009. Soil samples were screened for Volatile Organic Compounds (VOCs) using a ThermoEnvironmental Instruments PID, Model 580B-OVM. VOC concentrations were measured utilizing the jar headspace method. Based on visual/olfactory observations, headspace screening results, and disposal classification requirements, AECOM personnel submitted a total of four (4) soil samples and one (1) trip blank for laboratory analysis. The following table summarizes the samples received from CE&C, the headspace results and the laboratory analyses performed.

**Table 1 – Summary of Soil Samples**

Date	Boring ID	Sample Depth	Headspace (ppm)	Laboratory Analysis
5/20/09	B-1	0-2'	0.6	VOC, SVOC, PP13, TPH-DRO
5/20/09	B-3	0-2'	0	None
5/21/09	B-3	4-6'	0	None
5/21/09	B-3	9-11'	6.5	VOC, SVOC, PP13, TPH-DRO
5/21/09	B-3	14-16'	0	None
5/21/09	B-3	19-21'	0	None
5/21/09	B-3	24-26'	0	None
5/20/09	B-7	0-2'	2.8	VOC, SVOC, PP13, TPH-DRO
6/4/09	B-7	4-6'	0	None
6/4/09	B-7	15-16'	0.8	VOC, SVOC, PP13, TPH-DRO

Soil samples were submitted to AMRO Environmental Laboratories in Merrimack, NH, a Rhode Island certified laboratory, for one or more of the following analyses: VOCs (EPA Method 8260), Semi-volatile Organic Compounds (SVOCs, EPA Method 8270), Priority Pollutant 13 Metals and Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO). CE&C/AECOM stored all of the samples on ice after collection and during transportation to the laboratory. Samples were handled and relinquished using standard quality assurance and chain-of-custody procedures.

A number of inorganic/metals were detected in all samples submitted for laboratory analysis and one sample (B-3) contained trace concentrations of semi-volatile organic compounds (SVOCs). RIDEM Method 1 Residential direct exposure criteria was exceeded for:

- Benzo(a)pyrene (B-3, 0.690 pm)
- Chrysene (B-3, 0.7 ppm)
- Arsenic (B-3, 33.4 ppm)
- Beryllium (B-1, 1.75 ppm; B-3, 1.12 ppm; B-7 0-2', 0.683 ppm; B-7 15-16', 0.483 ppm)
- Lead (B-3, 209 ppm)

The concentrations of beryllium in boring B-1 and arsenic in B-3 were the only samples which exceeded the Industrial/Commercial direct exposure criteria. No samples exceeded the Method 1 Upper Concentration Limits. No volatile organic compounds were detected in any of the samples.

The contaminant levels of metals are higher than typical background levels, which may be attributed to the disposal practices of the adjacent property used as a junkyard/disposal site. In addition, the level of SVOC contamination is consistent with historic fill/background. None of the identified contamination poses a significant risk to human health or the environment. A tabulation of the identified contaminants is provided in the attached Table 3. The full laboratory data is also attached.

### **Groundwater Sampling and Analytical Results**

Monitoring well construction was performed in accordance with the procedures and guidelines detailed in Appendix 1 of the *RIDEM Rules and Regulations for Groundwater Quality* (Regulation 12-4100-006), dated May 1992, as amended August 1996. The monitoring wells were constructed of Schedule 40, 2-inch ID PVC riser pipe, attached with threaded joints to Schedule 40, 2-inch ID, 0.010-inch slotted PVC, 5-foot and 10-foot well screens. All wells were protected with a locking steel protective guard pipe/road box set in concrete with expansion plugs to prevent tampering/vandalism and infiltration of rainwater.

During October 2009, AECOM developed two monitoring wells (B-4 and B-7) using a peristaltic pump and disposable dedicated bailers. All of the monitoring wells were characterized by extremely high silt content and therefore were repeatedly pumped until dry, after allowing the well to fully recharge over a 10 to 15 minute period. After repeating this process several times, the groundwater cleared of some turbidity caused by suspended silt in the water. The standing volume of water in each well was calculated using the depth to water and total well depth measurements. A total of at least five times the standing volume of water was purged from each well. The wells were allowed to equilibrate for 72 hours prior to sampling. Water level measurements were also obtained for each of the wells.

On October 15, 2009, AECOM personnel collected two (2) groundwater samples from Borings B-4 and B-7 using a peristaltic pump. During sample collection, no free product was encountered in any of the wells installed at the Site. All samples were submitted to AMRO for one or more of the following analyses: VOCs (EPA Method 5035/8260), Semi-volatile Organic Compounds (SVOCs, EPA Method 8270), Polychlorinated Biphenyl Compounds/Pesticides (PCBs, EPA Method 8080), Priority Pollutant 13 Metals, and Total Petroleum Hydrocarbons – Diesel Range Organics. AECOM stored all of the samples on ice after collection and during transportation to the laboratory. Samples were handled and relinquished using standard quality assurance and chain-of-custody procedures.

**Table 2 – Summary of Groundwater Samples**

Date	Boring ID	Depth to Water from Top of Casing	Laboratory Analysis
10/15/09	B-4	9.38'	VOC, SVOC, PP13, TPH-DRO
10/15/09	B-7	7.90'	VOC, SVOC, PP13, TPH-DRO

None of the groundwater samples contained concentrations of contaminants exceeding RIDEM Method 1 Residential direct exposure criteria. A copy of the laboratory data is attached.

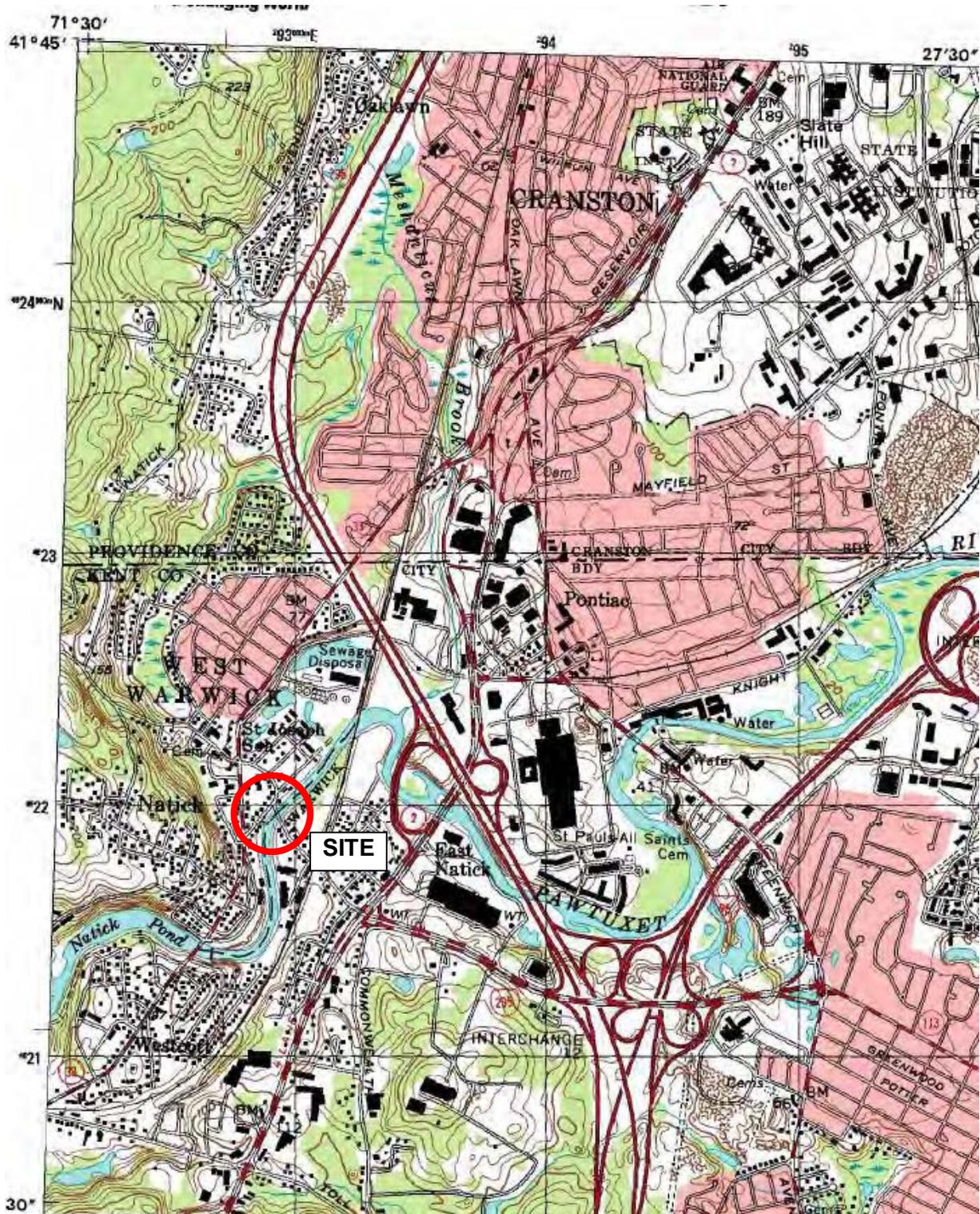
**Conclusions/Recommendations**

Based on the data collected to date, AECOM concludes that soil at the Site is impacted with contamination from metals and trace levels of SVOCs above applicable RIDEM Residential Criteria. Groundwater at the site is not impacted. AECOM recommends the following actions to address the contamination encountered at the site:

- Immediately notify RIDEM of the identified contamination above applicable Soil Objectives via the applicable Release Notification Form.
- Meet with CE&C to review the current construction documents, limits of excavation, method of excavation and schedule. Develop remedial strategies based on the information obtained during the meeting with CE&C.
- Prepare a Site Investigation Report (SIR) consistent with RIDEM Regulations (included in our current scope of work as the Phase II Report) which will identify remedial options to be implemented during construction.
- Prepare specifications to identify the proposed remedial strategies and disposal options to be included in the final contract documents.
- Soils excavated from the Site can be removed, transported, and disposed off-site at either Central Landfill in Johnston, Rhode Island or Turnkey Landfill in Rochester, New Hampshire. The material will be transported and disposed in accordance with all applicable federal, state, and local solid and hazardous waste laws and regulations.
- Groundwater encountered during construction will require handling, settling of solids and discharge to the River of Warwick Sanitary system according to the NPDES permit for the Project.

All involved parties should agree upon the remediation strategy, including RIDOT and RIDEM. Should you have any additional questions, please do not hesitate to contact me directly.

Figure 1 – Locus Map



**Appendix C**

February 17, 2011 Program Letter



February 17, 2011

**PROGRAM LETTER**

**CASE # 2011-007**

Peter A. Healey, P.E.  
Acting Chief Civil Engineer  
Environmental Resources/Highway Engineering  
Rhode Island Department of Transportation  
Engineering Division  
Two Capitol Hill, Rm. 226  
Providence, RI 02903-1124

RE: **Natick Bridge #383-Map Plat 40, Lot 371 (25 River Street)** in West Warwick, Rhode Island

Dear Mr. Healey:

On February 24, 2004, the Rhode Island Department of Environmental Management (the Department; RIDEM OWM) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of sites in order to eliminate and/or control threats to human health and the environment in a timely and cost-effective manner. The purpose of a Program Letter is to indicate that the Department deems the investigation of the reported release complete and to notify the Responsible Party that they must perform Public Notice in accordance with Sections 7.07 and 7.09 of the Remediation Regulations.

The Department has reviewed the following documents regarding the Site Investigation at the above-referenced site:

1. **Site Investigation Report (final), Natick Bridge No. 383, Warwick/West Warwick, Rhode Island**, prepared by AECOM and submitted by RIDOT; dated November 17, 2010 and received December 8, 2010.
2. **Site Investigation Report, Natick Bridge No. 383, Warwick/West Warwick, Rhode Island**, prepared by AECOM and submitted by RIDOT; dated July 28, 2010 and received August 26, 2010.

The Department regards the information provided in these above-referenced reports as meeting the requirements pursuant to Rule 7.08 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations), as amended February

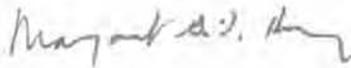
**2004. The preferred remedial alternative for contamination located at Map Plat 40, Lot 371 (25 River Street) in West Warwick proposes excavation and disposal of all contaminated soil in exceedance of the Method 1 Residential Direct Exposure Criteria pursuant to the Remediation Regulations.**

The Department acknowledges that the site investigation activities are complete. The Department is not yet able to formally approve the SIR, however, due to the necessity to first allow the public to comment on the preferred Remedial Alternative. Rules 7.07 and 7.09 of the Remediation Regulations outline the requirements for public notice to property abutters, tenants, the City of Warwick and Town of West Warwick, and utilities with easements regarding the substantive findings of the completed investigation and the opportunity for public review and comment on the technical feasibility of the preferred remedial alternative. A draft notification should be sent to the Department for review and approval prior to distribution. The Department will require a copy of the approved Public Notice letter and a list of all recipients, including abutters, tenants and the City of Warwick and Town of West Warwick.

The Department will formally approve the SIR in the form of a Remedial Decision Letter upon RIDEM OWM approval of all final responses to relevant public comments received following the comment period. At that point, the Department will require submission of the draft Remedial Action Work Plan, along with a remediation SMP for review and approval

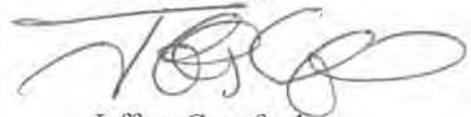
If you have any questions regarding this letter, please contact Margaret Bradley by telephone at (401) 222-2797 ext. 7105 or by email at [margaret.bradley@dem.ri.gov](mailto:margaret.bradley@dem.ri.gov).

Sincerely,



Margaret Dein Bradley, CPG  
Sr. Environmental Scientist  
Office of Waste Management

Authorized by:



Jeffrey Crawford  
Principal Environ. Scientist  
Office of Waste Management

cc. Kelly Owens, RIDEM OWM  
Erik Johnstone, RIDOT

**Appendix D**  
Contract Design Plans

STATE OF RHODE ISLAND



INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2-4	STANDARD SYMBOLS, LEGEND AND NOTED
5	JOB SPECIFIC PLAN SYMBOLS, LEGEND AND NOTES
6	TYPICAL SECTIONS
7-10	GENERAL NOTES
11-12	GENERAL PLANS
13-14	DRAINAGE AND UTILITY PLANS 1-2
15-17	GRADING PLANS 1-2
18-20	CROSS SECTIONS 1-2
21-22	CROSS SECTIONS 1-1B
23-24	BRIDGE PLANS
25-26	LANDSCAPE PLAN

ALL DIMENSIONS UNLESS OTHERWISE NOTED ARE IN FEET AND DECIMALS THEREOF.  
 SPECIFICATIONS TO COVER THIS PROJECT ARE THE R.I. STANDARD SPECIFICATIONS FOR  
 AND FEDERAL SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS.  
 ALL DIMENSIONS SHALL BE FOR THE PROJECT AREA. STANDARD DETAILS, WHERE APPLICABLE,  
 SHALL BE USED.

PLAN, PROFILES AND SECTIONS OF PROPOSED  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383

PROJECT LIMITS

ASTER STREET TO STATION 18+00  
 WEST WARWICK AND WARWICK, RHODE ISLAND  
 COUNTY OF KENT

R.I. CONTRACT NO. F.A. PROJECT NO.

DATE	BY	REVISION	DATE	BY	REVISION
10/10/10	1	ISSUE FOR BIDDING	10/10/10	1	ISSUE FOR BIDDING



LOCATION MAP

DESIGN DESIGNATION EAST AVE

2010 AADT = 16,500 V.P.D.  
 2030 AADT = 20,900 V.P.D.  
 2010 DHV = 1,400 V.P.H.  
 2030 DHV = 1,900 V.P.H.  
 D = 50/50  
 F = 5%  
 S = 3%  
 V = 30 M.P.H.



LAYOUT PLAN

SCALE 1"=80'  
 SCALES OF DRAWINGS  
 Profile: 1"=20' (horizontal)  
 1"=4' (vertical)  
 Creek Sections: 1"=4' (horizontal)  
 1"=2' (vertical)

BASE OF LEVELS  
 NGVD 1929 VERTICAL  
 RI PLANE COORDINATE SYSTEM  
 NAD 1983 HORIZONTAL



STEVEN M. CURRAN  
 REGISTERED PROFESSIONAL ENGINEER  
 COMMONWEALTH ENGINEERS  
 & CONSULTANTS, INC.

10/10/10

ENVIRONMENTAL  
 SUBMISSION  
 OCTOBER 8, 2010

R.I. DEPARTMENT OF TRANSPORTATION

APPROVED	DATE
DEPUTY CHIEF ENGINEER	DATE
APPROVED	DATE
CHIEF ENGINEER	DATE
APPROVED	DATE
DIRECTOR	DATE
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
APPROVED	DATE
ENGINEER/ADMINISTRATOR	DATE

Contract Number  
 Volume Number  
 Number of Sheets: 1  
 Total Sheets: 55



01043E-VI-001-COVER

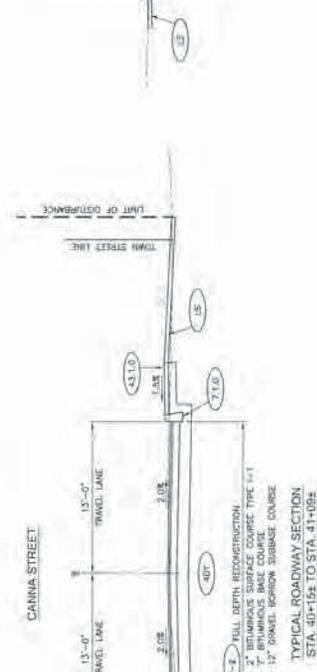
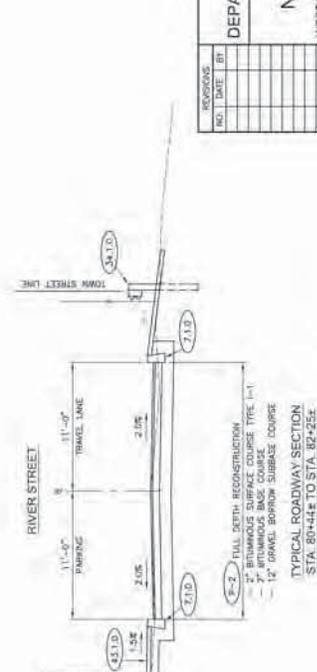
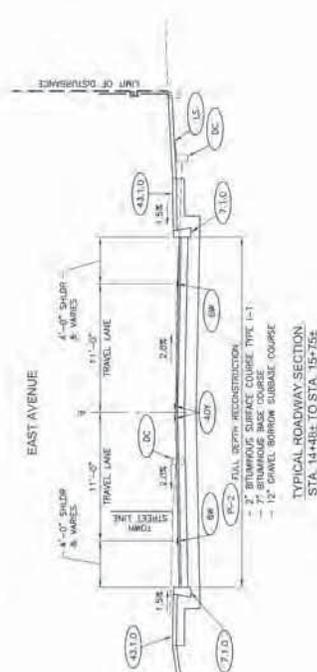
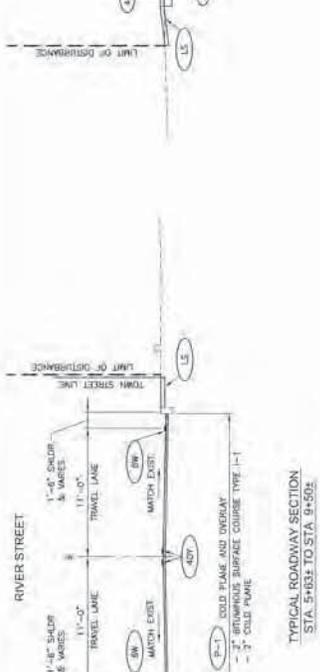
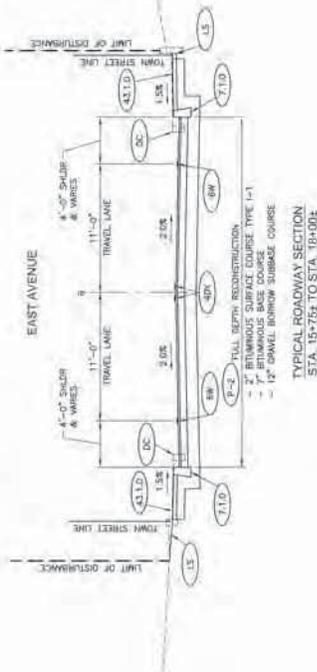
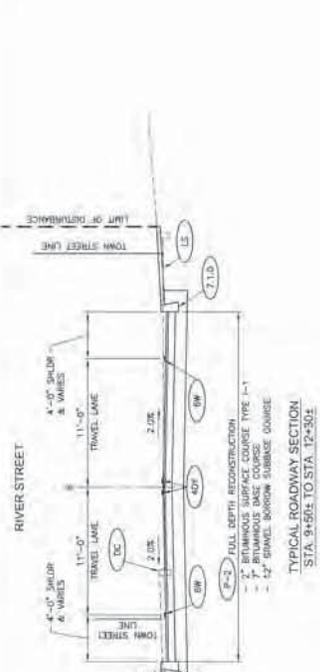








DATE	BY	CHKD	APP'D	SCALE	FIG. NO.	TOTAL FIGS.
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RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383  
WEST WARWICK / WARWICK, RHODE ISLAND

REVISIONS

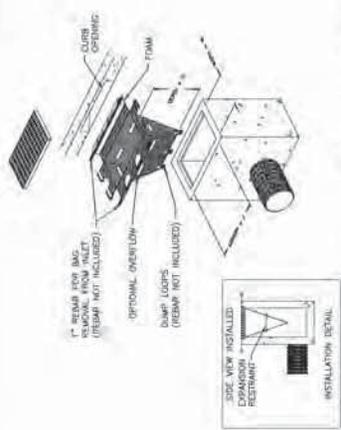
NO.	DATE	BY	CHKD

**COMMONWEALTH**  
PROVIDENCE & BOSTON OFFICES  
400 WATER STREET, SUITE 2000  
PROVIDENCE, RI 02903

DESIGNED BY: GRII SCALE: 1" = 3'  
DRAWN BY: J. L. DUBOIS

DATE	REV	BY	CHKD	APP'D	DATE

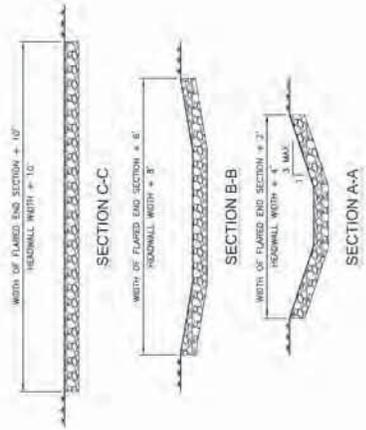
NO.	DATE	BY	CHKD	APP'D	DATE
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SEDIMENTATION CONTROL - CATCH BASIN  
NOT TO SCALE



SEDIMENTATION CONTROL - INLET STRUCTURE  
NOT TO SCALE



TYPICAL LAYOUT OF RIP-RAP OUTLET PROTECTION AT FLARED END SECTIONS AND HEADWALLS  
NOT TO SCALE

- NOTES:
- UNLESS OTHERWISE SPECIFIED, PLACED RIP-RAP SHALL BE USED.
  - CONCRETE HEADWALLS SHALL BE USED UNLESS OTHERWISE SPECIFIED.
  - PLACE A LAYER OF FILTER FABRIC BETWEEN THE STONE AND BEDDING.

NO.	DATE	BY	CHKD	APP'D	DATE

RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383  
WEST WARWICK / WARWICK, RHODE ISLAND  
TYPICAL DETAILS PLAN NO. 1



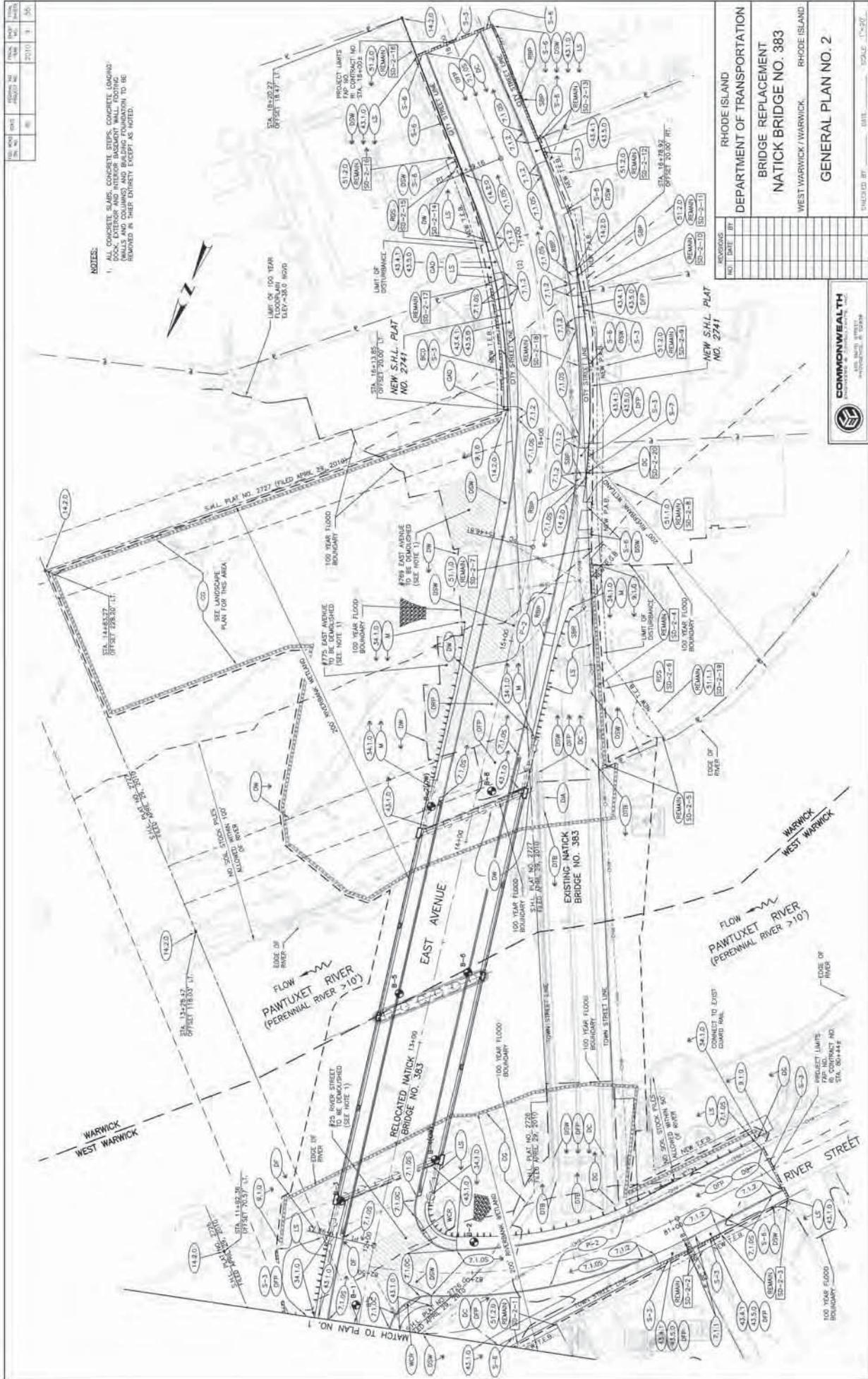
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**NOTES:**

1. ALL CONCRETE SLABS, CONCRETE STEPS, CONCRETE LOADING DOCK, EXTERIOR AND INTERIOR BARGAIN WALL FOOTING, AND ALL OTHER CONCRETE STRUCTURES TO BE REMOVED IN THEIR ENTIRETY EXCEPT AS NOTED.



**RHODE ISLAND**  
**DEPARTMENT OF TRANSPORTATION**  
**BRIDGE REPLACEMENT**  
**NATICK BRIDGE NO. 383**  
 WEST WARWICK / WARWICK, RHODE ISLAND  
**GENERAL PLAN NO. 2**

NO.	DATE	BY

**COMMONWEALTH**  
 ENGINEERING & ARCHITECTURE  
 100 N. MAIN ST., SUITE 200  
 WARWICK, RI 02886  
 TEL: 401-863-1111  
 FAX: 401-863-1112  
 WWW.COMENG.COM



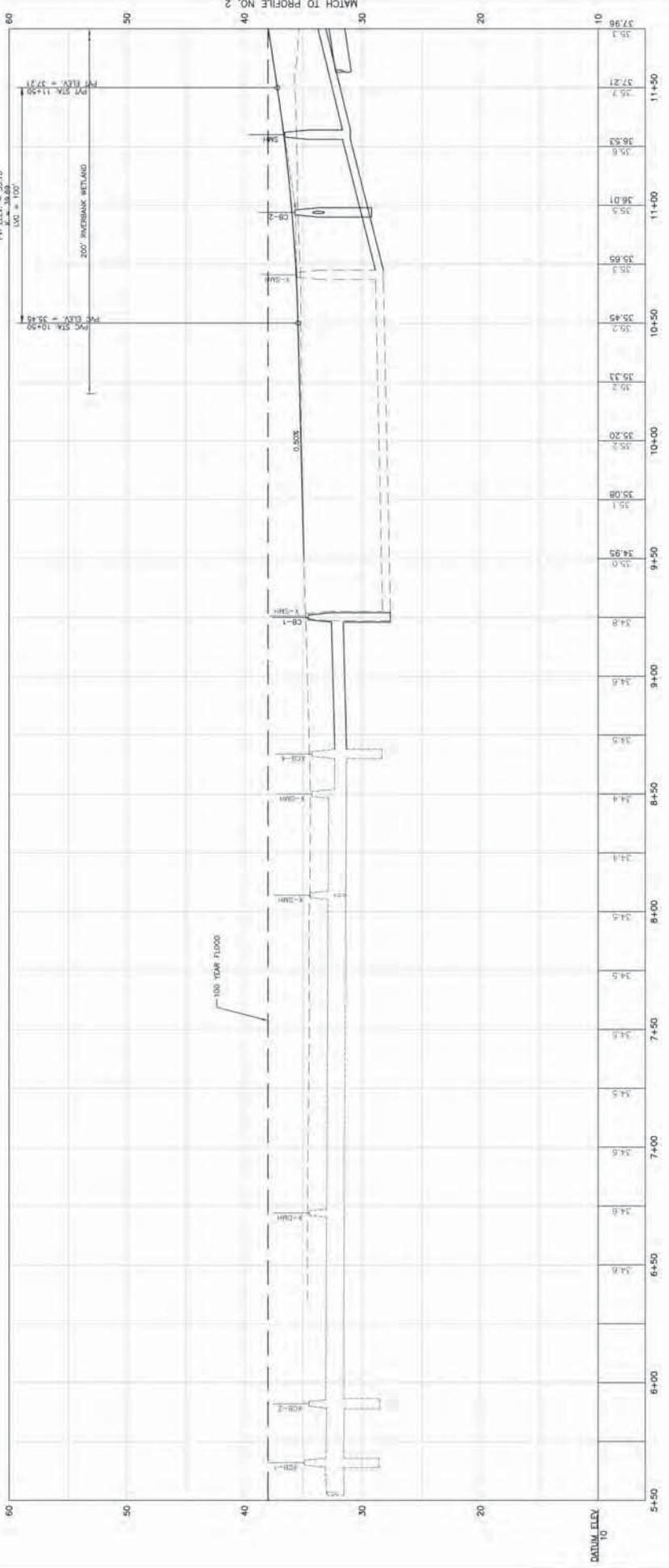






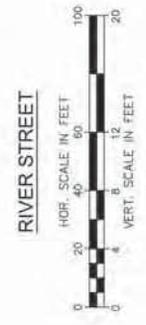
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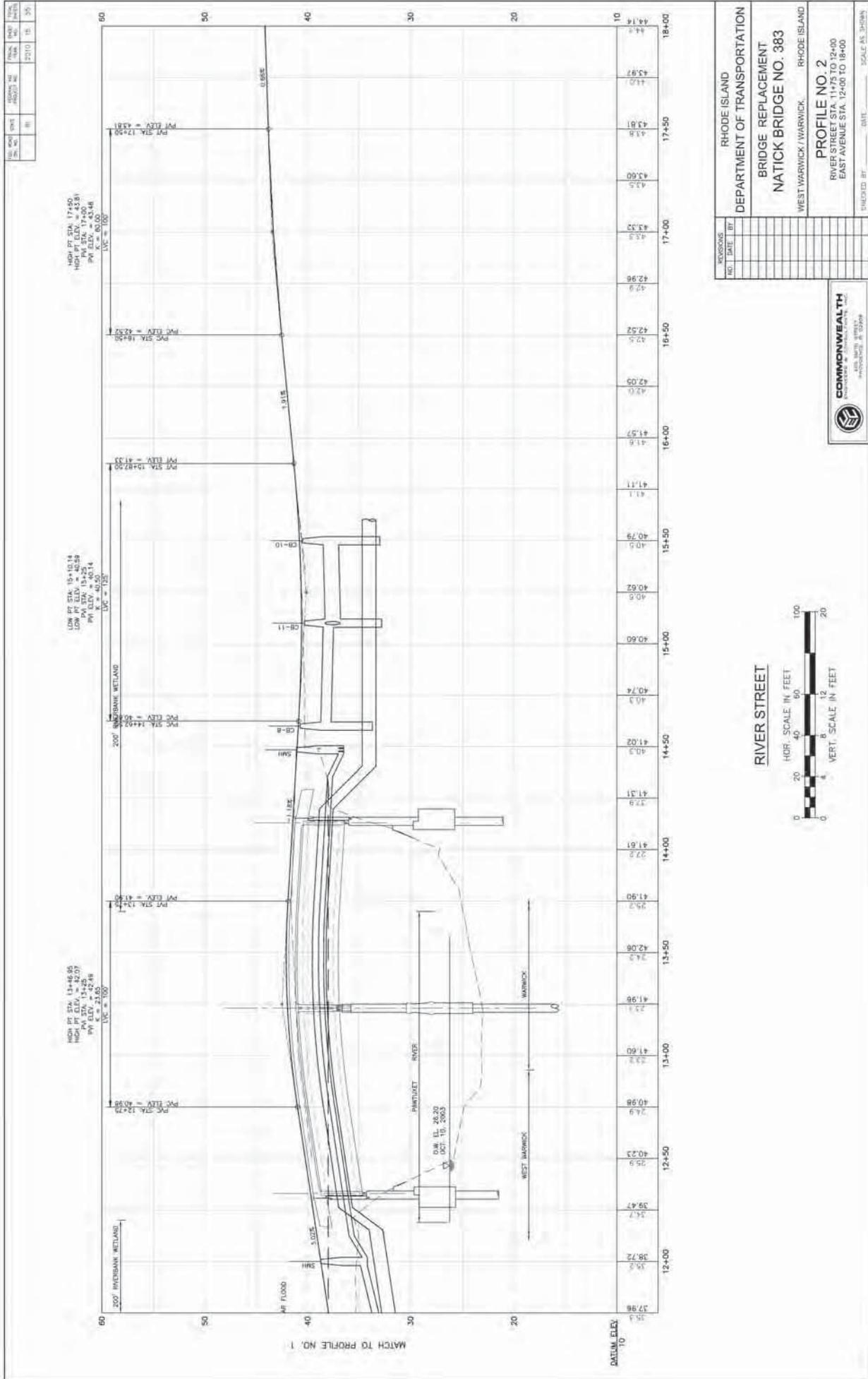
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 PV ELEV. = 35.70  
 LVC = 100'



RHOADE ISLAND  
 DEPARTMENT OF TRANSPORTATION  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383  
 WEST WARWICK / WARWICK, RHOADE ISLAND  
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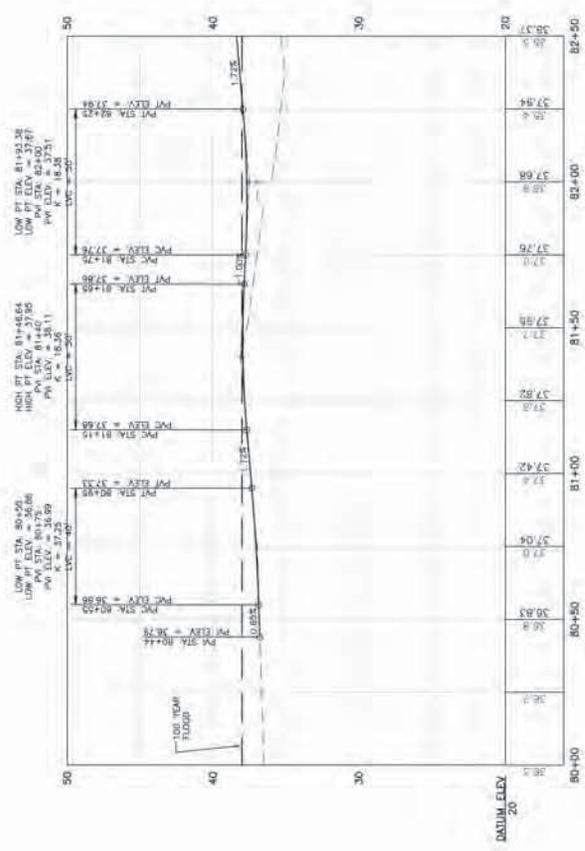
COMMONWEALTH  
 ENGINEERS & ARCHITECTS, INC.  
 1000 STATE STREET, SUITE 200  
 WARWICK, RI 02886  
 (401) 863-1234  
 www.commonwealth-engineers.com



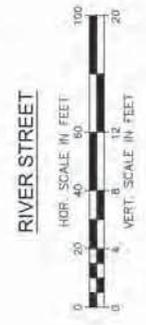


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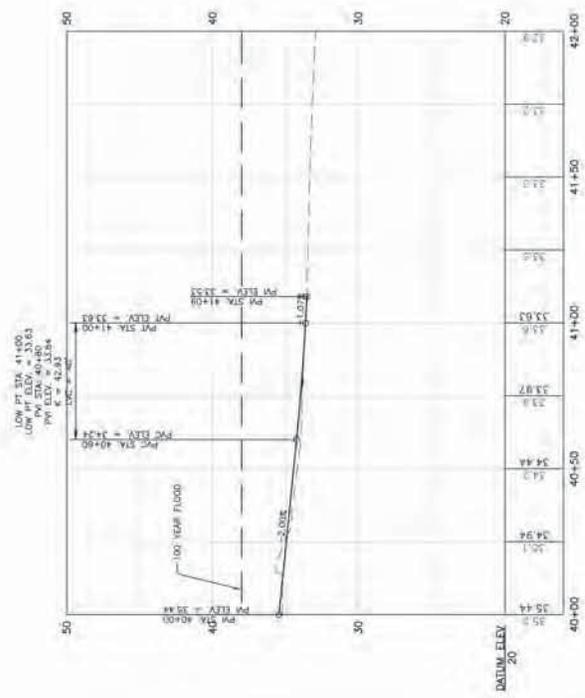
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RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383  
WEST WARWICK / WARWICK, RHODE ISLAND  
PROFILE NO. 3  
RIVER STREET STA. 80+00 TO 82+50  
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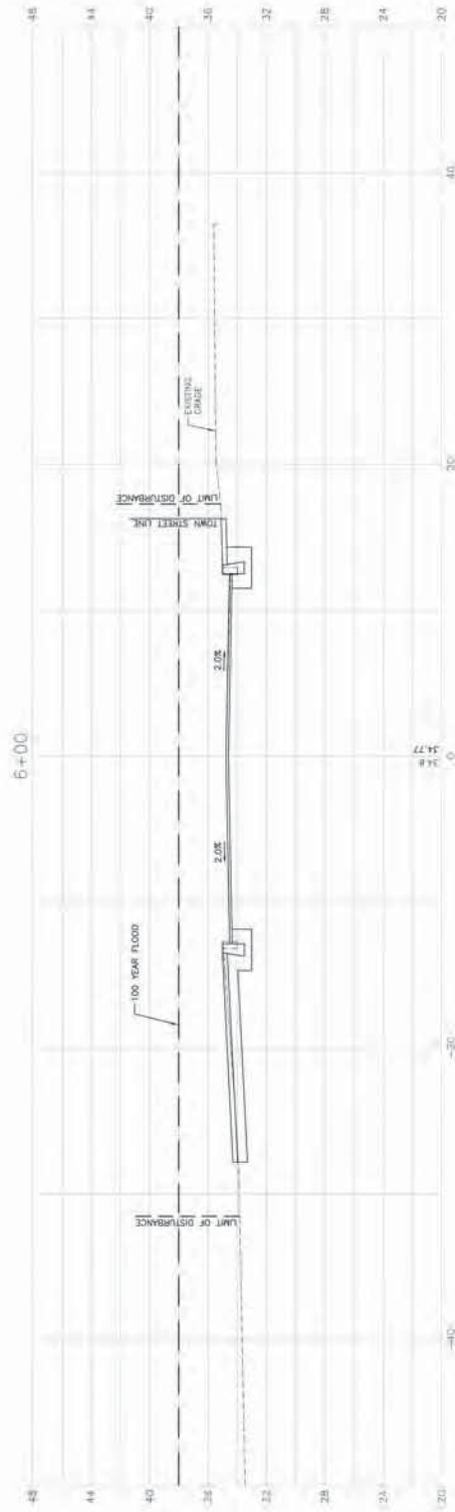
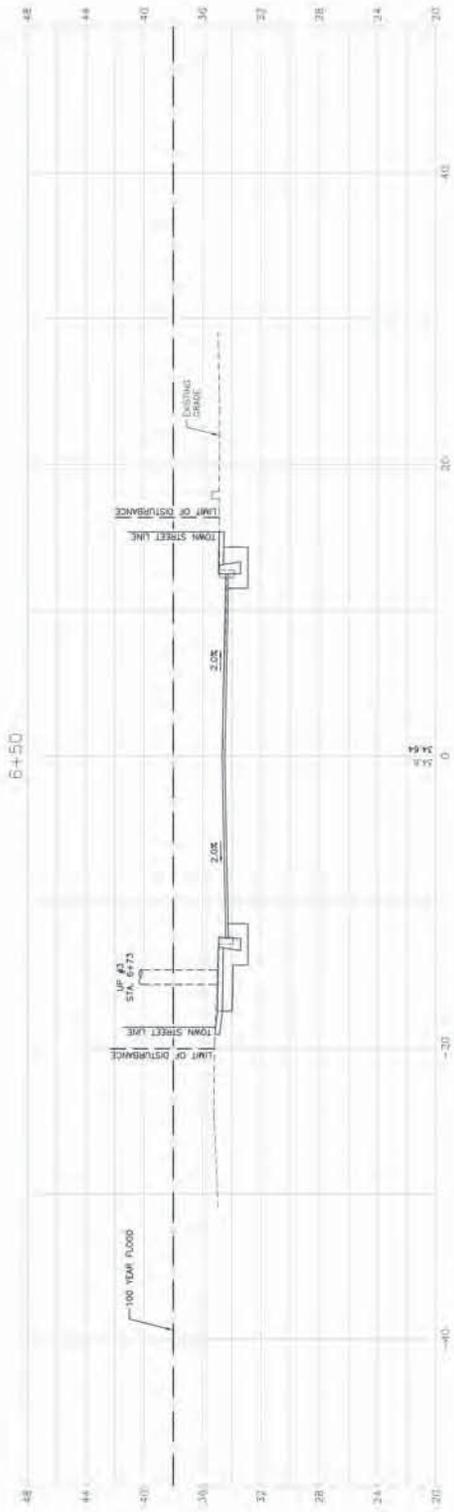
CANNAS STREET



RHODE ISLAND  
 DEPARTMENT OF TRANSPORTATION  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383  
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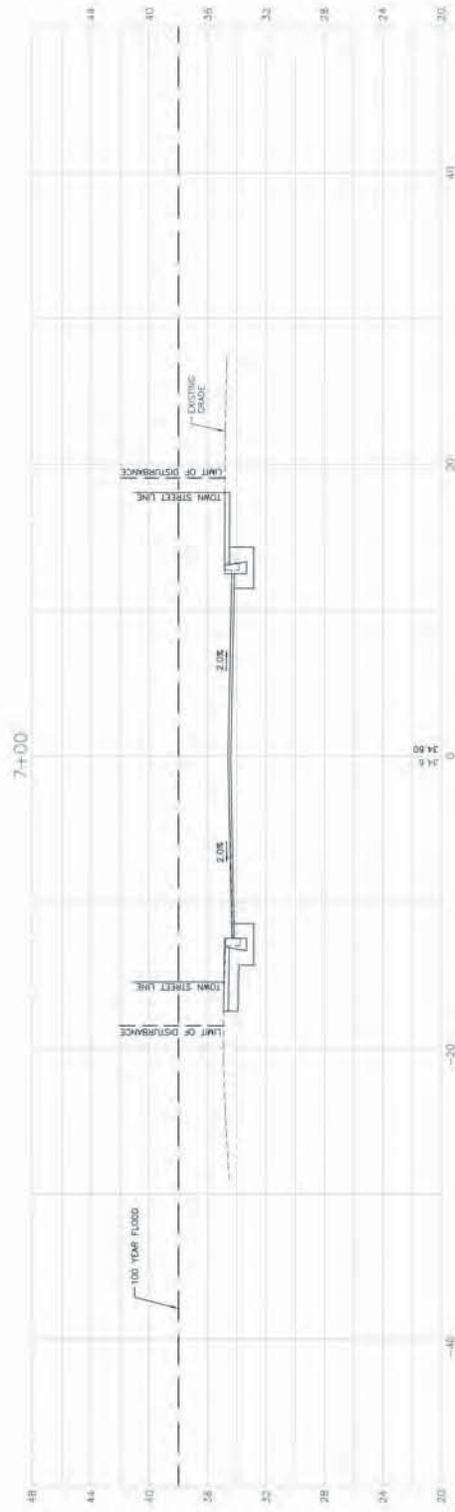
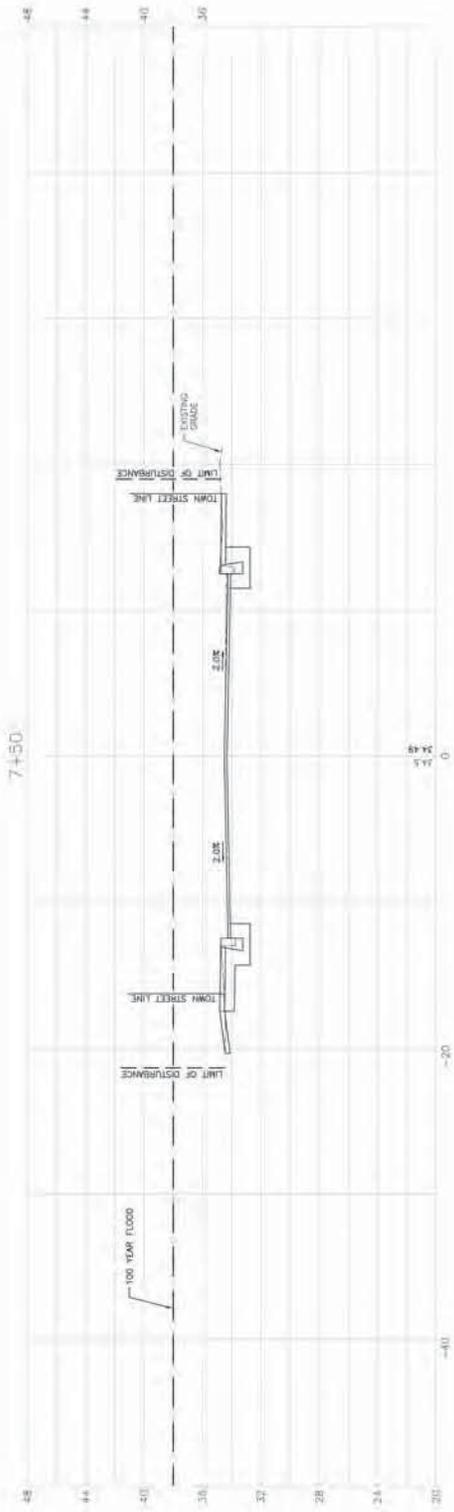


RIVER STREET  
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DATE	BY	REVISION	DATE	BY	REVISION
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RIVER STREET  
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NATICK BRIDGE NO. 383

WEST WARWICK / WARWICK, RHODE ISLAND

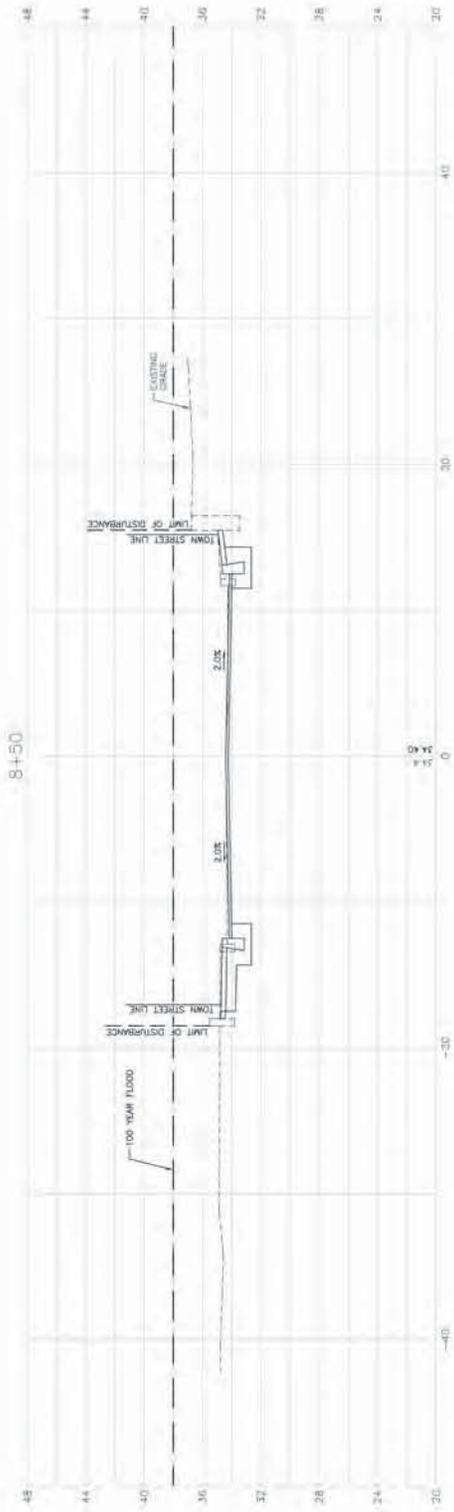
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NO.	DATE	BY



**COMMONWEALTH**  
OF RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION

DATE	BY	REVISION	DATE	BY	REVISION
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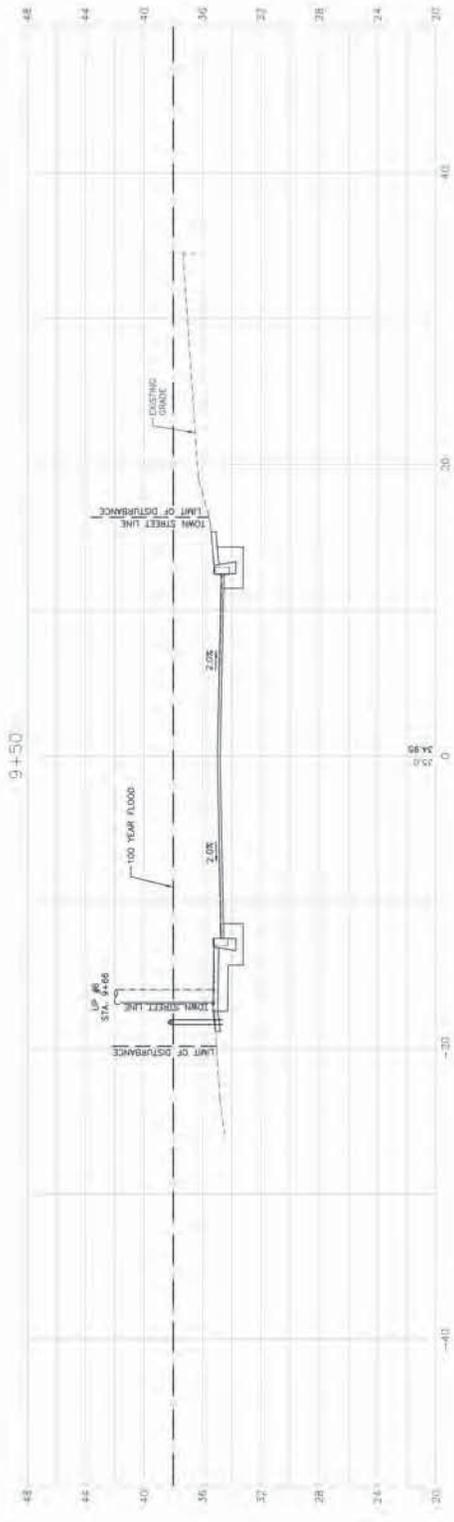


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REVISIONS	NO.	DATE	BY



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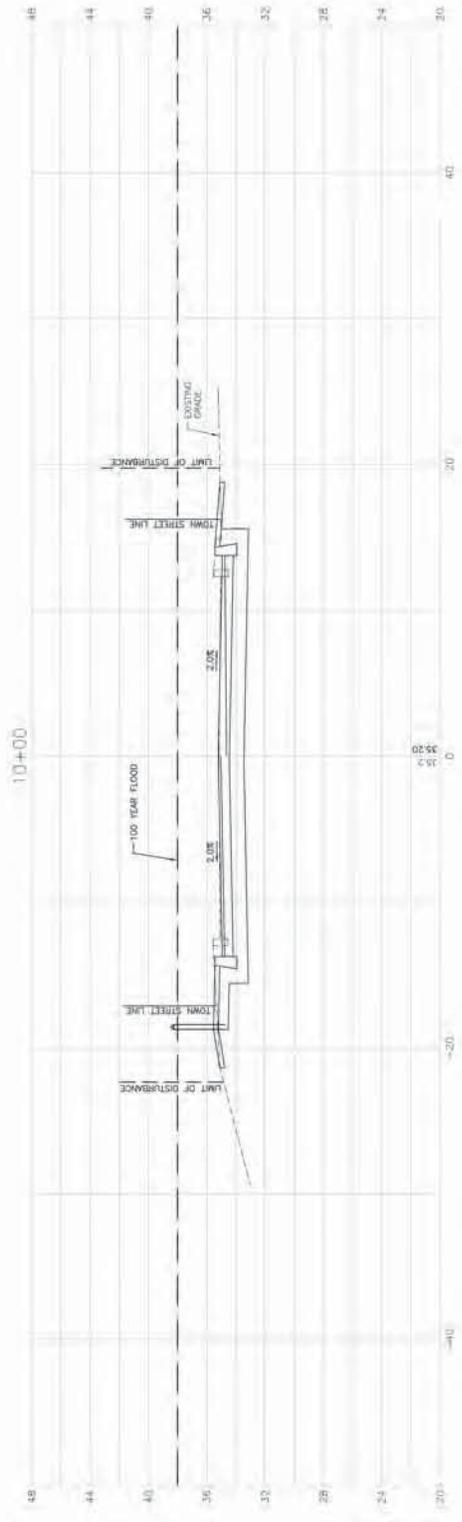
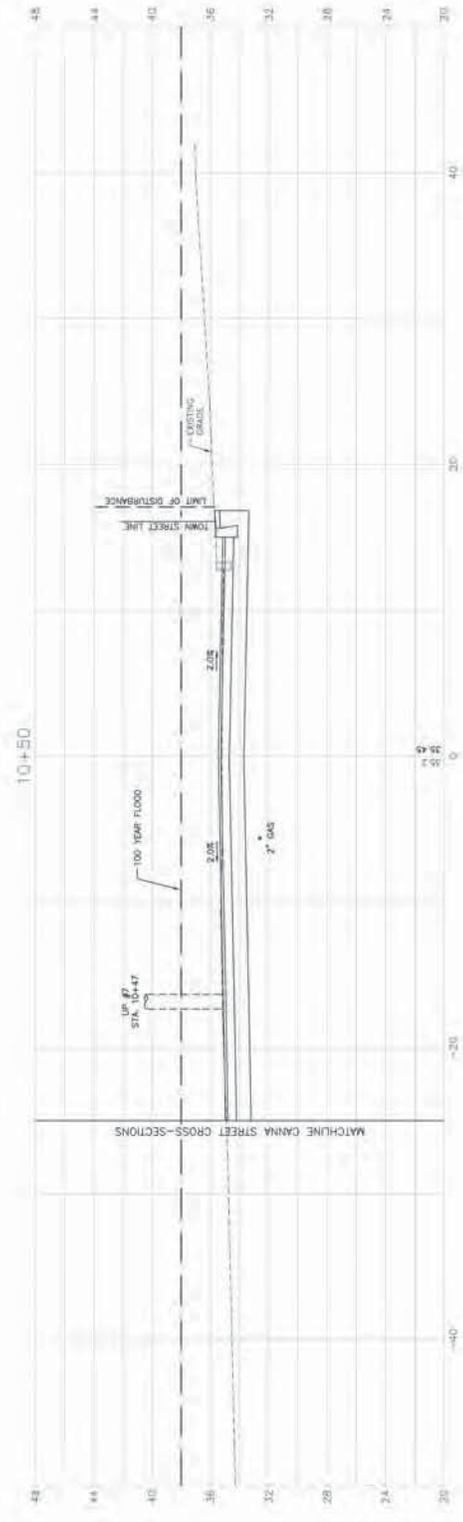


RIVER STREET  
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 NATICK BRIDGE NO. 383  
 WEST WARWICK / WARWICK, RHODE ISLAND  
 CHECKED BY: DATE: SCALE: 1"=40'

NO.	DATE	BY



DATE	BY	SCALE	PROJECT NO.	DATE	BY	SCALE	PROJECT NO.
			2210				



RIVER STREET  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383

WEST WARWICK / WARWICK, RHODE ISLAND

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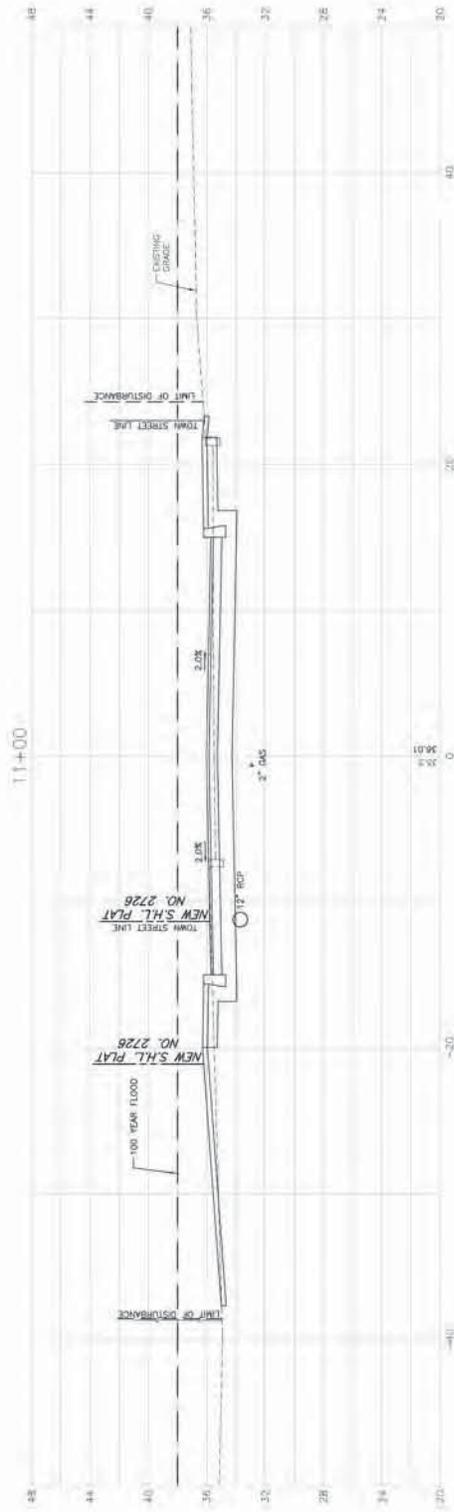
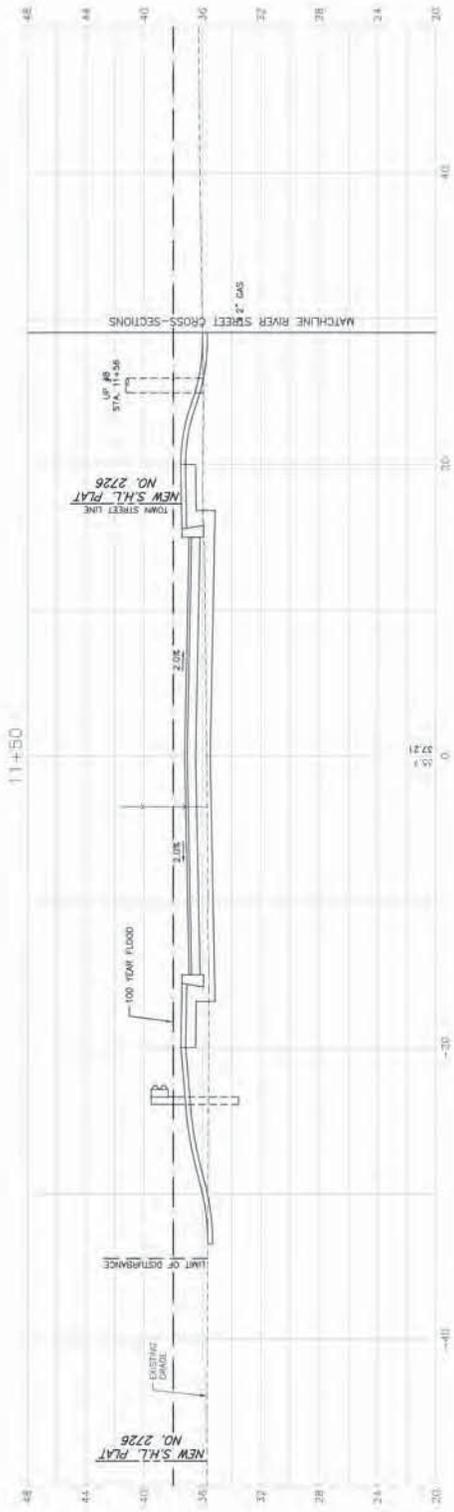
01436.V1.002 - SECTION 02

NO.	DATE	BY



**COMMONWEALTH**  
OF RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION

DATE	BY	SCALE	PROJECT NO.	DATE	BY	SCALE	PROJECT NO.
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**RIVER STREET**

**BRIDGE REPLACEMENT**  
**NATICK BRIDGE NO. 383**

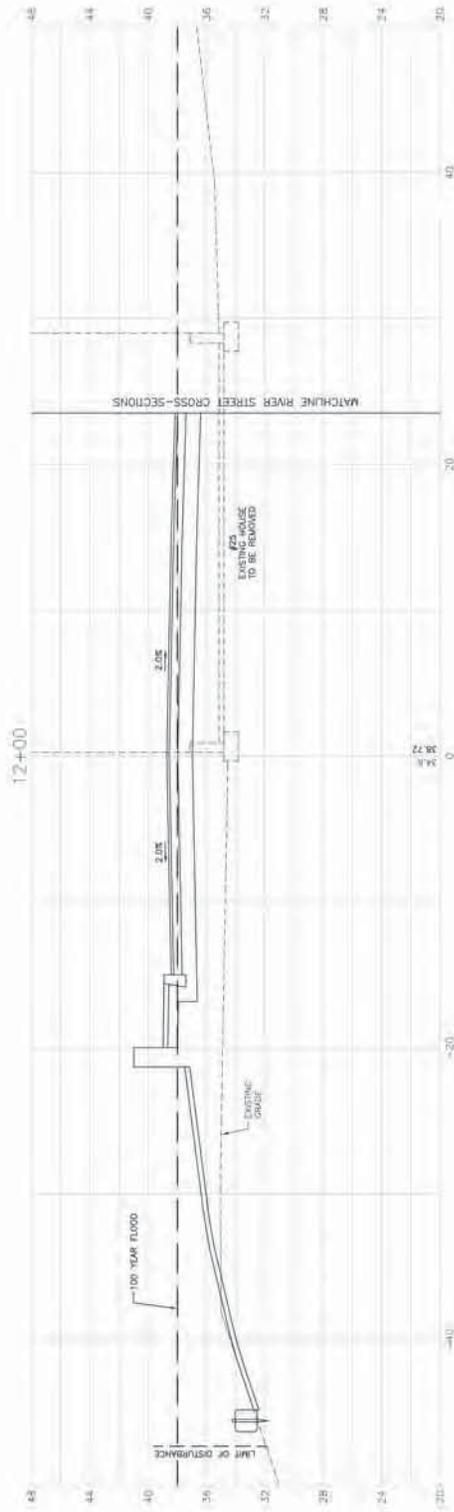
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PROJECT NO. 2010-23-00

**COMMONWEALTH**  
ENGINEERS & ARCHITECTS, INC.  
PROFESSIONAL REGISTERED

DATE	BY	DESCRIPTION	SCALE	DATE	BY	DESCRIPTION	SCALE
				2010	24	00	



EAST AVENUE

**BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383**

WEST WARWICK / WARWICK, RHODE ISLAND

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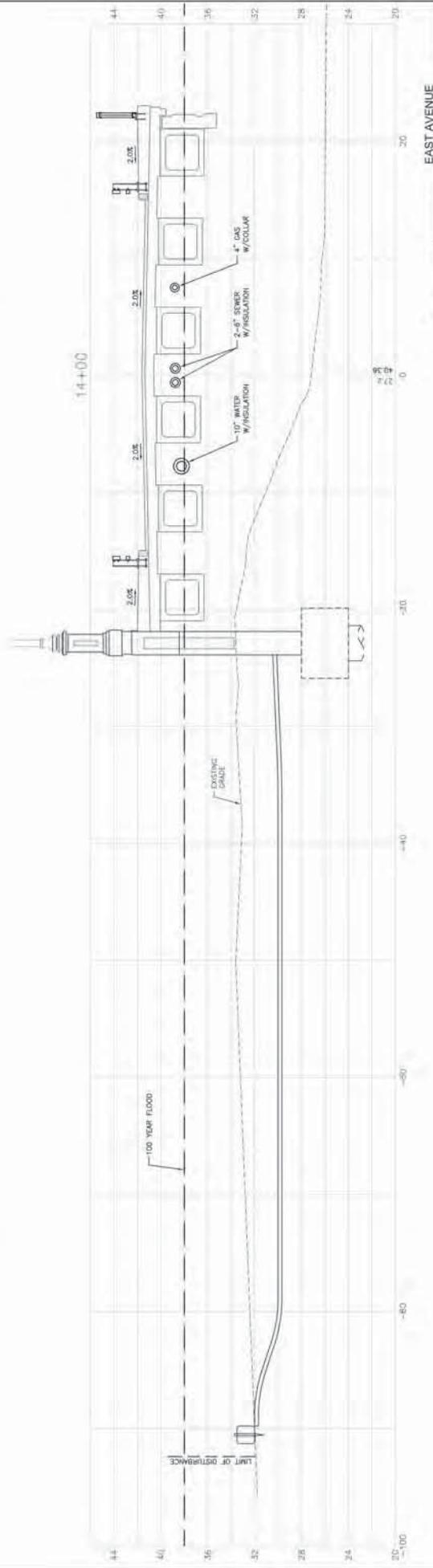
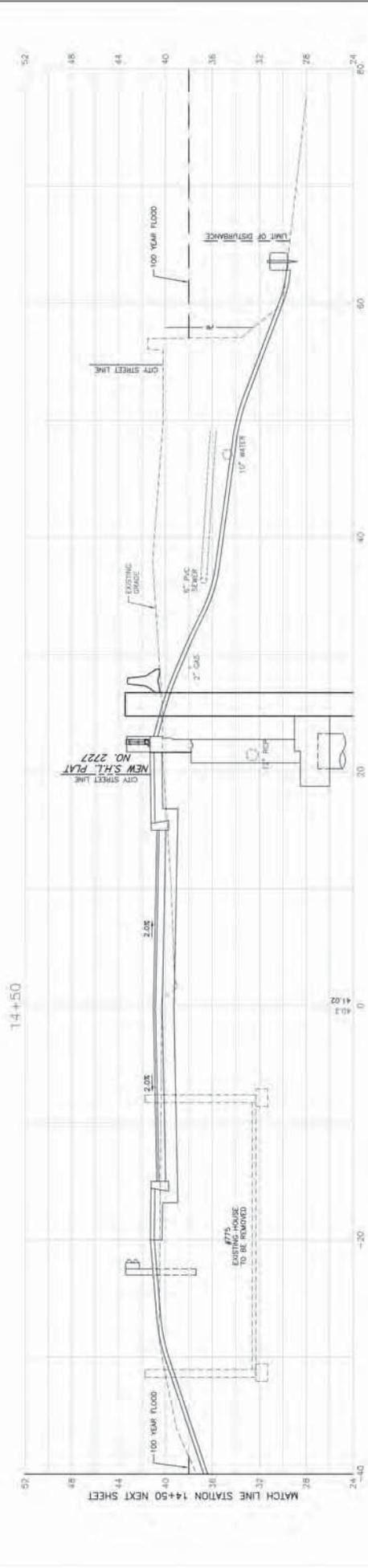
PROJECT NO. 8143E-VT-29A-KS5270902

NO.	DATE	BY



**COMMONWEALTH**  
OFFICE OF STATE PLANNING AND  
CONSTRUCTION

NO.	DATE	BY	DESCRIPTION
1	10/10/10	MM	ISSUED FOR PERMIT
2	10/10/10	MM	ISSUED FOR PERMIT
3	10/10/10	MM	ISSUED FOR PERMIT
4	10/10/10	MM	ISSUED FOR PERMIT



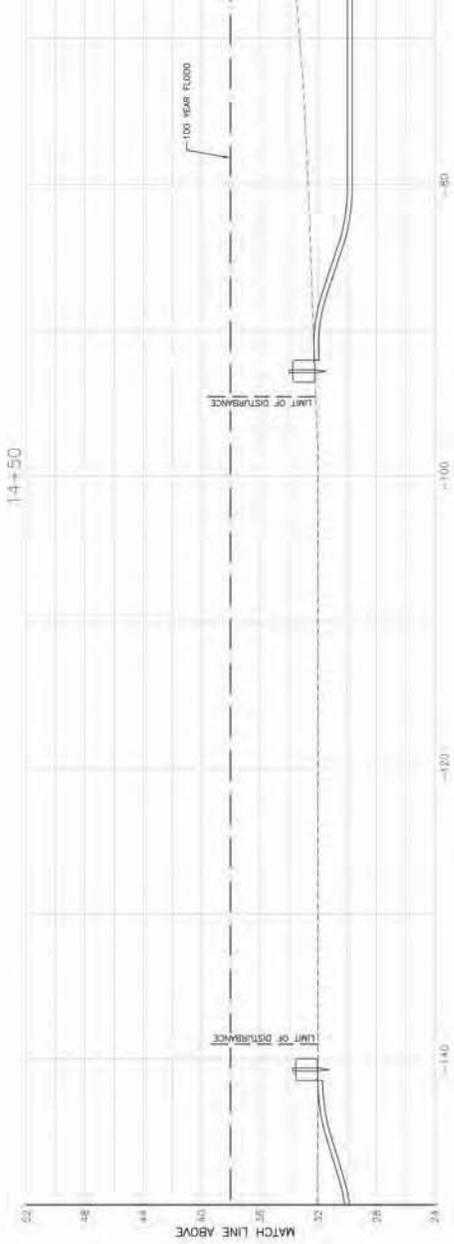
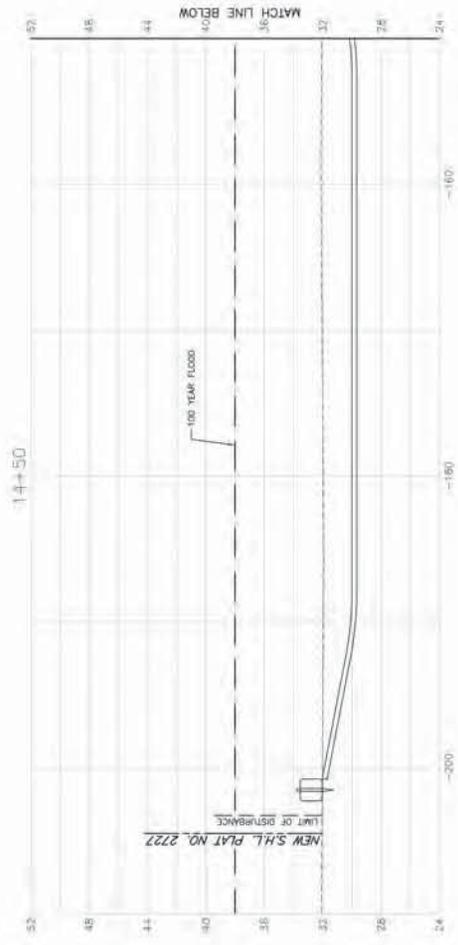
NO.	DATE	BY	REVISIONS

**COMMONWEALTH**  
 ENGINEERS & ARCHITECTS, INC.  
 100 WATER STREET, SUITE 200  
 WARWICK, RHODE ISLAND 02886

BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383

WEST WARWICK / WARWICK, RHODE ISLAND  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'-0"  
 81142\_V1\_102\_1352709028

DATE	BY	CHKD BY	DATE	BY	CHKD BY	DATE	BY



**EAST AVENUE**  
**BRIDGE REPLACEMENT**  
**NATICK BRIDGE NO. 383**

WEST WARWICK / WARWICK, RHODE ISLAND

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'

0143E\_V1\_09A\_SECTION0600

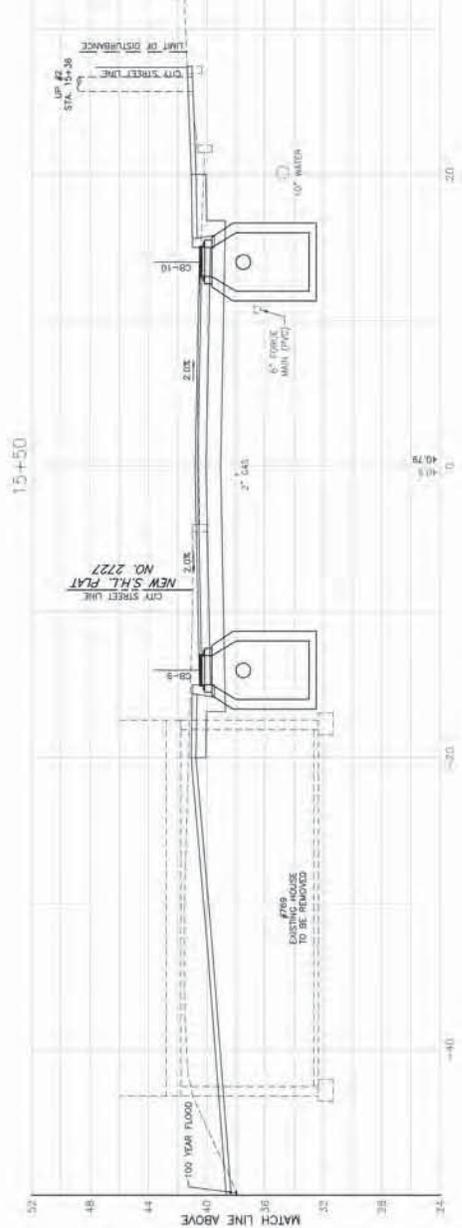
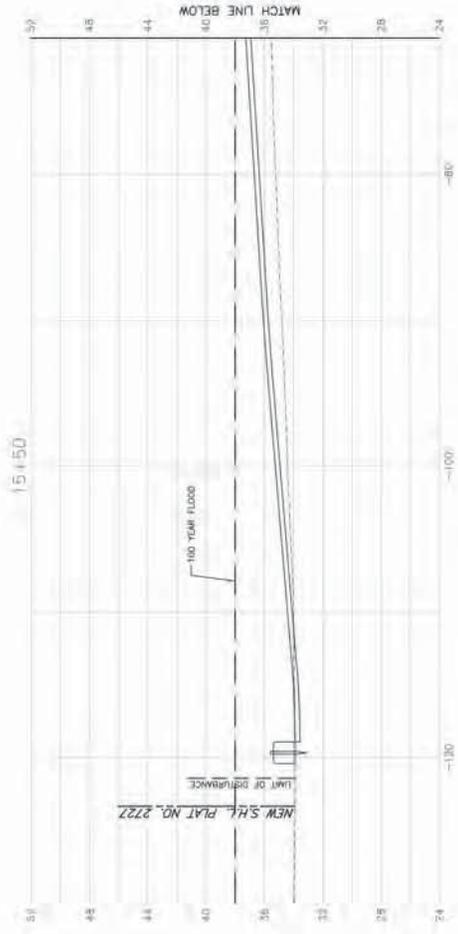
REVISIONS	
NO.	DATE



**COMMONWEALTH**  
OF RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION



DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY



**EAST AVENUE**  
**BRIDGE REPLACEMENT**  
**NATICK BRIDGE NO. 383**

WEST WARWICK / WARWICK, RHODE ISLAND

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'

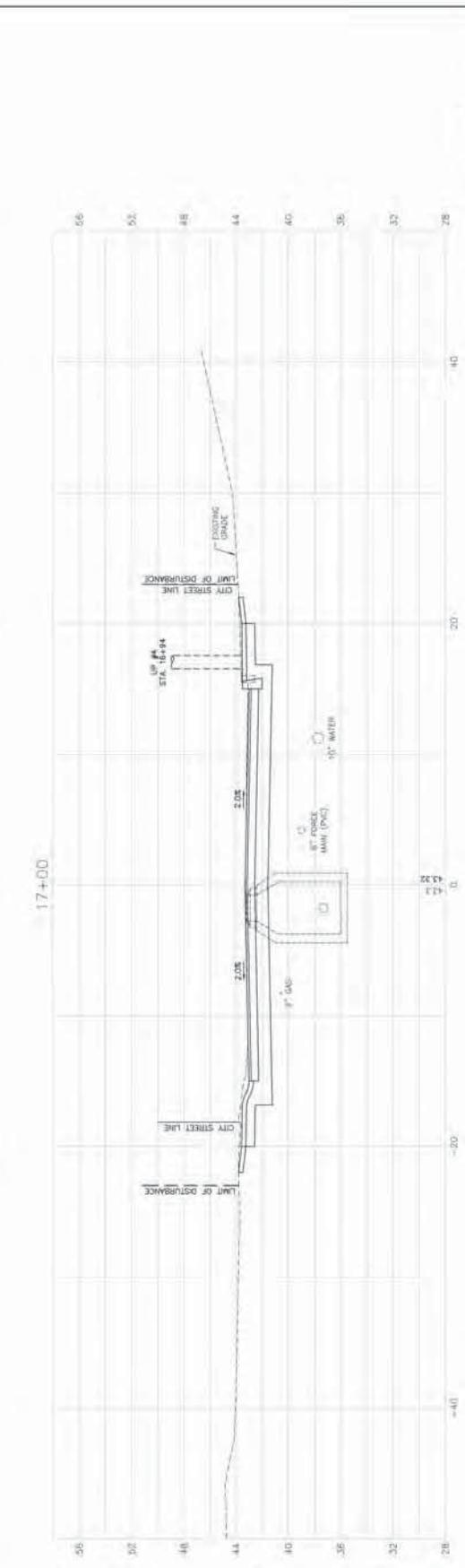
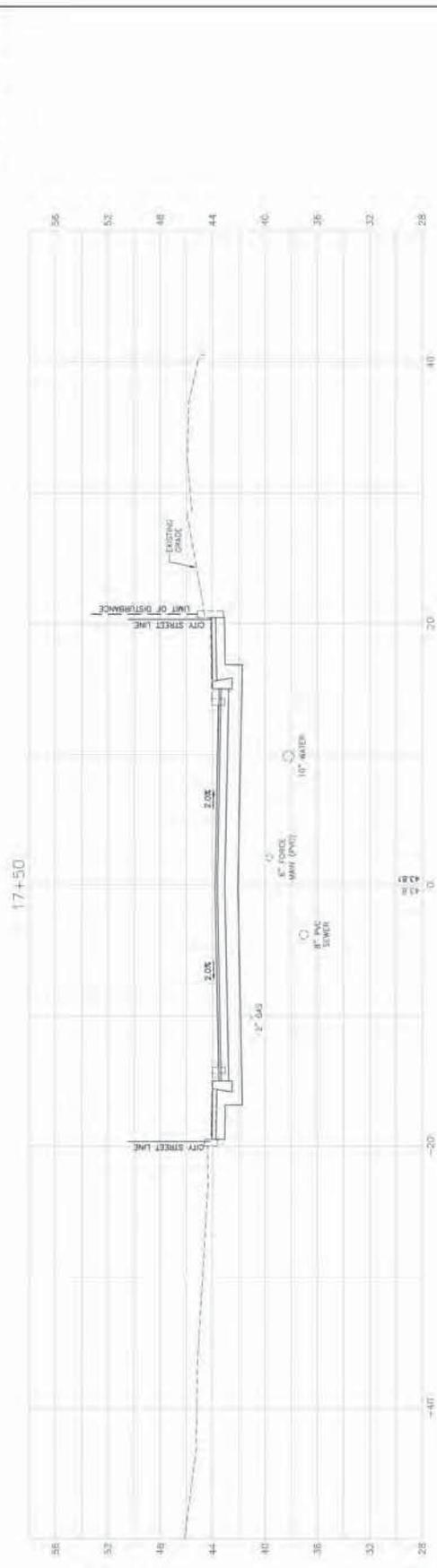
01143E\_V1\_226L\_SECTION01

REVISIONS	NO.	DATE	BY

**COMMONWEALTH**  
ENGINEERS & ARCHITECTS, INC.  
PROFESSIONAL REGISTERED



DATE	BY	DESCRIPTION	SCALE	DATE	BY	DESCRIPTION
12/10	30	31	32	33	34	35



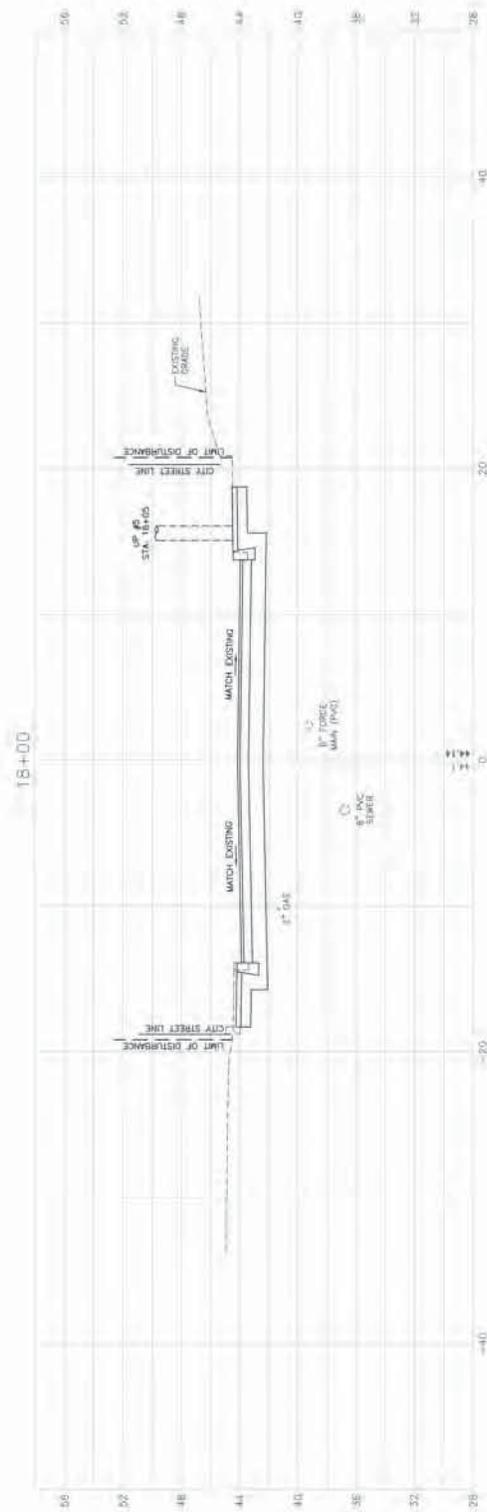
EAST AVENUE  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383

REVISIONS	NO.	DATE	BY



WEST WARWICK / WARWICK, RHODE ISLAND  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'  
 01436\_V1\_030\_KS5270601

DATE	BY	REVISION	DATE	BY	REVISION
2010	21	86			



EAST AVENUE

REVISIONS	
NO.	DATE / BY

**BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383**

WEST WARWICK / WARWICK, RHODE ISLAND

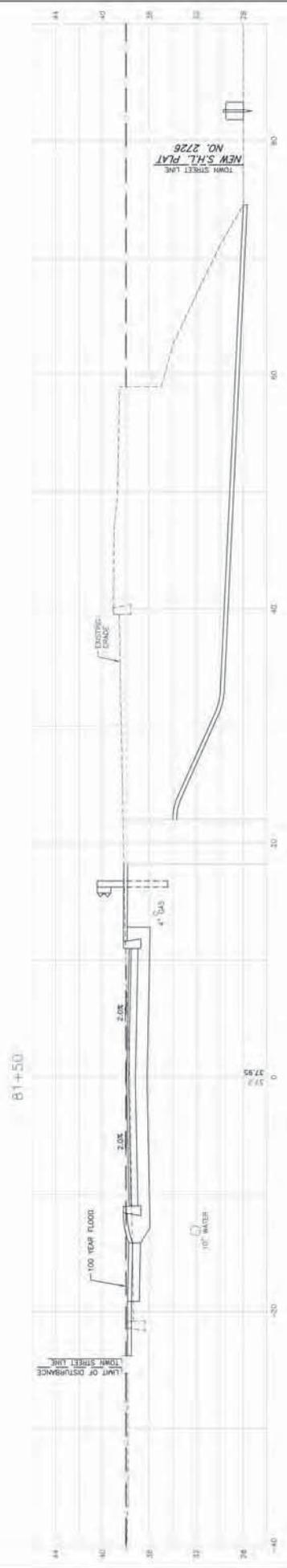
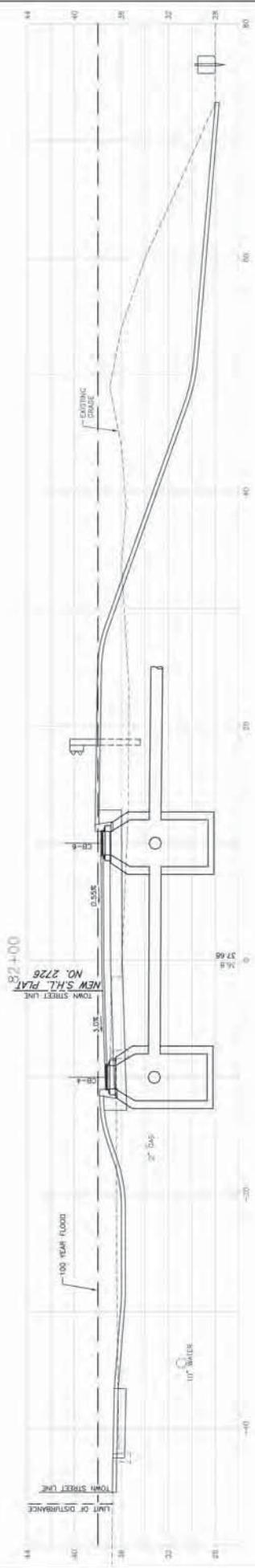
CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'



**COMMONWEALTH**  
ENGINEERING & CONSTRUCTION, INC.  
PROFESSIONAL ENGINEERS



DATE	BY	CHKD BY	DATE	NO.	REVISION
2010	23	2010	23	26	



RIVER STREET  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383

WEST WARWICK / WARWICK, RHODE ISLAND

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'

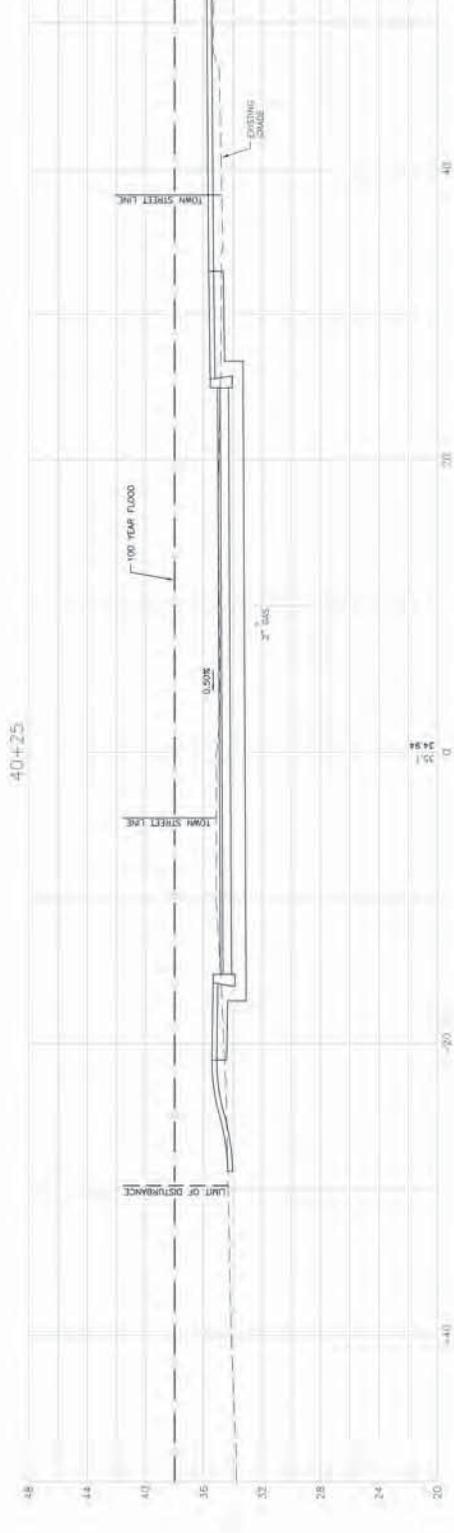
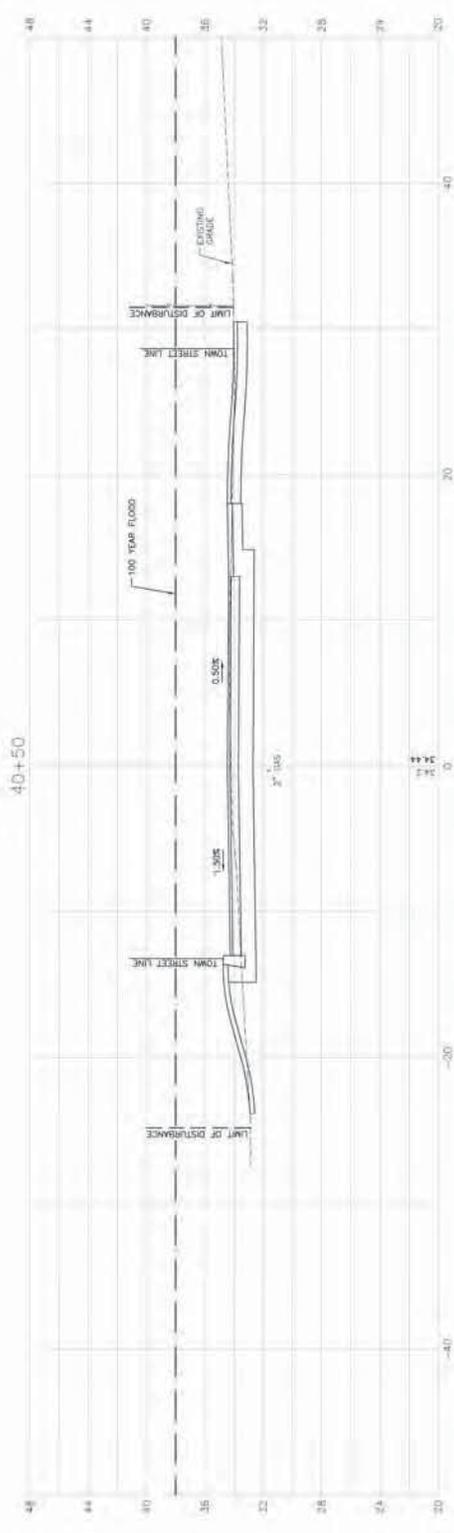
8143E\_V1\_031\_SECTION01

NO.	DATE	BY

**COMMONWEALTH**  
PROFESSIONAL ENGINEERS & ARCHITECTS, INC.  
PROVIDENCE, RHODE ISLAND



DATE	BY	SCALE	PROJECT NO.	DATE	BY	SCALE	PROJECT NO.
			2310	25	26		



CANINA STREET

**BRIDGE REPLACEMENT**  
**NATICK BRIDGE NO. 383**

WEST WARWICK / WARWICK, RHODE ISLAND

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ SCALE: 1"=4'

REVISIONS	NO.	DATE	BY

**COMMONWEALTH**  
OF RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION





NO.	DATE	REVISIONS	BY
1	01		
2			
3			
4			
5			

ALL REFERENCES IN THESE GENERAL NOTE SHEETS AND THROUGHOUT THE CONTRACT DRAWINGS TO THE METHOD OF MEASUREMENT SECTION AND THE BASIS OF PAYMENT SECTION FOR ITEMS PAID FOR UNDER VARIOUS LUMP SUM ITEMS UNDER THIS CONTRACT.

**GENERAL NOTES**

- ALL CONSTRUCTION INDICATED ON THESE PLANS SHALL BE IN ACCORDANCE WITH:
  - THE 2004 EDITION OF AND SUPPLEMENTS TO THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (R) STANDARD SPECIFICATIONS.
  - THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LIVED BRIDGE CONSTRUCTION SPECIFICATIONS, FIFTH EDITION, DATED 2010, INCLUDING THE LATEST INTERIM REVISIONS.
  - THE SPECIFICATIONS ACCOMPANYING THESE PLANS.
- DIMENSIONS, STATIONS, AND ELEVATIONS ARE SHOWN TO THE NEAREST ONE-HUNDREDTH OF A FOOT AND ARE TO BE CONSIDERED AS APPROXIMATE UNLESS OTHERWISE NOTED.
- ALL ELEVATIONS ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1928 (NGVD 83).
- COORDINATES USED ON THESE PLANS ARE BASED ON THE STATEWIDE COORDINATE SYSTEM, THE NORTH AMERICAN DATUM OF 1983 (NAD83).
- TOPOGRAPHIC CONDITIONS WERE OBTAINED FROM AERIAL PHOTOGRAMMETRY. ACCURACY OF VERTICAL TOPOGRAPHY IS WITHIN ONE-HALF OF A FOOT.
- FOR BENCH MARKS AND TIES SEE HIGHWAY LOCATION PLANS.
- ANGLES ARE SHOWN TO THE NEAREST SECOND.
- ALL FOOTINGS SHALL BE APPROVED BY THE ENGINEER AS TO DIMENSIONS, ELEVATIONS, AND SUITABILITY OF FOUNDATION MATERIAL BEFORE THE PLACING OF CONCRETE.
- ALL WORKING POINTS ARE SHOWN AT THE CENTERLINES OF BEARINGS OF ABUTMENTS AND AT THE CENTERLINES OF PIERS UNLESS OTHERWISE NOTED.
- ALL ABUTMENTS AND WALLS ARE DRAWN LOOKING AT THE EXPOSED FACE.
- THE EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND WERE LOCATED USING THE BEST AVAILABLE INFORMATION. NO BUILDING SERVICE CONNECTIONS (ELECTRIC, GAS, WATER, SEWER, ETC.) ARE SHOWN. THE CONTRACTOR IS TO ASSUME THAT SERVICES TO ALL BUILDINGS ARE PRESENT.
- BOTH FEDERAL AND STATE LAW (39-1-32) REQUIRE NOTIFICATION OF THE STATE AND LOCAL GOVERNMENTS OF ANY CONSTRUCTION OF BRIDGES, BACK FILLING, GRADING, LANDSCAPING, OR OTHER EARTH MOVING OPERATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES (INCLUDING THROUGH THE "NO SAFE" PROGRAM) TO ENSURE THAT ALL UTILITIES, BOTH UNDERGROUND AND OVERHEAD, HAVE BEEN IDENTIFIED AND CORRECTLY MARKED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR THE PROTECTION OF ALL EXISTING UTILITIES MARKED IN THE FIELD, OR AS A RESULT OF FAILING TO CONTACT THE APPROPRIATE UTILITY COMPANIES, SHALL BE REPAIRED OR REPLACED (AS DEEMED APPROPRIATE BY THE STATE) AND/OR THE IMPACTED UTILITY COMPANY AT NO ADDITIONAL COST TO THE STATE.
- FOR OTHER APPLICABLE GENERAL PROJECT REQUIREMENTS, REFER TO THE CONTRACT GENERAL PROVISIONS AND THE HIGHWAY GENERAL NOTES.

**DESIGN DATA**

**1. DESIGN SPECIFICATIONS**

- THE AASHTO LIVED BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION, DATED 2010, INCLUDING ALL INTERIM REVISIONS TO DATE.
- THE RHODE ISLAND LIVED BRIDGE DESIGN MANUAL, DATED 2007, INCLUDING ALL REVISIONS TO DATE.
- OTHER APPLICABLE DESIGN SPECIFICATIONS ARE REFERENCED IN SECTION 1 OF THE RHODE ISLAND LIVED BRIDGE DESIGN MANUAL, DATED 2007.
- THE 2004 REVISION OF AND SUPPLEMENTS TO THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (R) IN CASE OF CONFLICT, THE RHODE ISLAND LIVED BRIDGE DESIGN MANUAL, DATED 2007 SHALL GOVERN.

**2. LOAD MODIFIERS**

- THE LOAD MODIFIERS FOR THIS PROJECT ARE AS FOLLOWS:
  - THE LOAD MODIFIER FOR DUCTILITY SHALL BE TAKEN AS 1.0 FOR ALL LIMIT STATES.
  - THE LOAD MODIFIER FOR REDUNDANCY SHALL BE TAKEN AS 1.0 FOR ALL LIMIT STATES.
  - THE LOAD MODIFIER FOR OPERATIONAL IMPORTANCE SHALL BE TAKEN AS 1.0.

**3. LOAD FACTORS**

- ALL LOAD FACTORS SHALL BE IN ACCORDANCE WITH THE AASHTO LIVED BRIDGE DESIGN SPECIFICATIONS, EXCEPT AS MODIFIED IN THE RHODE ISLAND LIVED BRIDGE DESIGN MANUAL (SPECIFIED BELOW):
  - THE LOAD FACTOR FOR TEMPERATURE GRADIENT SHALL BE TAKEN AS ZERO FOR ALL LIMIT STATES.
  - THE LOAD FACTOR FOR LIVE LOADS FOR THE EXTREME EVENT SHALL BE TAKEN AS ZERO.
  - THE LOAD FACTOR FOR DEAD LOAD FOR THE EXTREME EVENT AND EXTREME EVENT II SHALL BE TAKEN AS 1.0.
  - THE LOAD FACTOR FOR SETTLEMENT FOR ALL LIMIT STATES SHALL BE TAKEN AS 1.0.

**4. LIVE LOADS**

- THE DESIGN VEHICULAR LIVE LOAD SHALL BE THE HL-93 DESIGNATION ADJUSTED FOR DYNAMIC LOAD ALLOWANCE AND MULTIPLE PRESENCE FACTOR.
- THE DESIGN PEDESTRIAN LIVE LOAD SHALL BE 75 PSF.

**5. FOUNDATION DESIGN DATA**

**DEEP FOUNDATIONS:**

THE FACTORED AXIAL RESISTANCES FOR THE VARIOUS DEEP FOUNDATION TYPES ARE AS FOLLOWS:

LOCATION	TYPE	GEOTECHNICAL		STRUCTURAL	
		STRENGTH LIMIT STATES	EXTREME LIMIT STATES	STRENGTH LIMIT STATES	EXTREME LIMIT STATES
NORTH & SOUTH ABUTMENT & PIER	DRILLED SHAFT	5700	N/A	4870	N/A
CENTER PIER	DRILLED SHAFT	5700	N/A	4870	N/A

- THE FACTORED DESIGN AXIAL RESISTANCE AT EACH LOCATION IS THE LARGER VALUE OF THE FACTORED GEOTECHNICAL AND THE FACTORED STRUCTURAL RESISTANCES INDICATED.
- ON THE NOMINAL AXIAL RESISTANCE AS DETERMINED USING THE AASHTO LIVED BRIDGE DESIGN SPECIFICATIONS AND A RESISTANCE FACTOR OF 0.8.

**6. WIND LOADING DESIGN DATA**

- THE WIND LOADING DESIGN SHALL BE IN ACCORDANCE WITH THE AASHTO LIVED BRIDGE DESIGN SPECIFICATIONS, THE RHODE ISLAND LIVED BRIDGE DESIGN MANUAL, AND AS MODIFIED HEREIN:
  - EXCEPT DURING CONSTRUCTION, THE DESIGN WIND PRESSURE IS BASED ON A DESIGN WIND SPEED OF 100 MPH.
  - THE DESIGN WIND PRESSURES DURING CONSTRUCTION SHALL BE AS SPECIFIED UNDER THE NOTES TITLED "GENERAL NOTES REGARDING TEMPORARY CONSTRUCTION CONDITIONS".

**7. TRAFFIC DATA**

- 2010 AADT = 18,500 V.P.D.
- 2030 AADT = 20,500 V.P.D.
- 2050 DNV = 1,600 V.P.H.
- 2050 PNV = 5000
- D = 8%
- K = 5%
- V = 50 MI (P.H.)

**8. HYDRAULIC AND SCOUR DATA**

- DESIGN FLOOD: 100 YEAR
- DESIGN FLOOD: 7.50 CUBIC FEET/SECOND
- DESIGN FLOOD: 100 YEAR
- DESIGN VELOCITY: 3.4 FEET/SECOND
- DESIGN HIGH WATER: ELEVATION 38.09 FEET

**9. THERMAL DESIGN FORCE DATA**

- UNIFORM TEMPERATURE EFFECTS HAVE BEEN TAKEN INTO CONSIDERATION IN ACCORDANCE WITH THE AASHTO LIVED BRIDGE DESIGN MANUAL.
- DESIGN TEMPERATURE SHALL BE 0 DEGREES F, AND THE MAXIMUM TEMPERATURE SHALL BE 100 DEGREES F.

**10. SEISMIC DESIGN DATA**

- THE SEISMIC ANALYSIS AND DESIGN SHALL BE IN ACCORDANCE WITH THE RHODE ISLAND LIVED BRIDGE DESIGN MANUAL.
- BRIDGE DESIGN MANUAL, ASSUMED AS "NON-CRITICAL".
- THE SITE HAS BEEN CLASSIFIED AS SITE CLASS "A".

REVISIONS		NO.		DATE		BY	
RHODE ISLAND DEPARTMENT OF TRANSPORTATION BRIDGE REPLACEMENT NATTICK BRIDGE NO. 383 WARWICK & WEST WARWICK, RHODE ISLAND STANDARD BRIDGE NOTES SHEET 1							
CHECKED BY						SCALE	



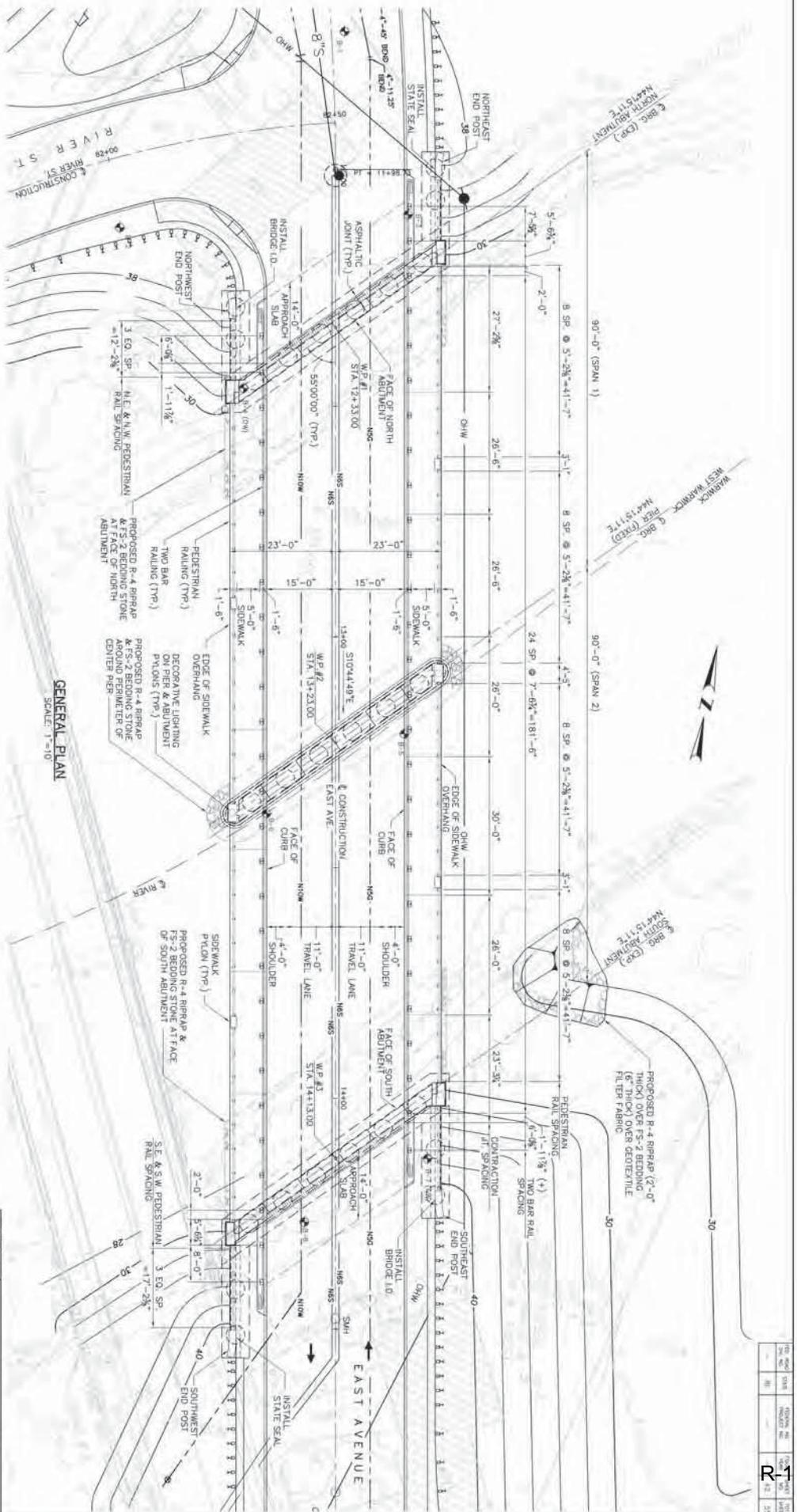






CONSTRUCTION WORKING POINTS			
WORKING POINT	STATION	NORTHING	EASTING
1	12+33.00	233,036.626	336,986.110
2	13+23.00	232,951.206	331,012.893
3	14+13.00	232,867.784	331,029.675

- NOTES:**
1. FOR CONSTRUCTION BASELINE GEOMETRY AND ALL OTHER HIGHWAY RELATED DATA, REFER TO THE CONSTRUCTION AND STRENGTHENING CONTRACT DRAWINGS, AND VERIFY CONSTRUCTION AND STRENGTHENING CONTRACT PLANS.
  2. FOR DIMENSIONS OF THE EXISTING WARWICK BRIDGE NO. 383, REFER TO DIMENSION PLAN SHEETS.
  3. FOR BORING LOG INFORMATION, REFER TO TEST BORING SHEETS.
  4. FOR LIMITS OF DISTURBANCE, REFER TO PHASE CONSTRUCTION PLANS.



**GENERAL PLAN**  
SCALE: 1"=10'

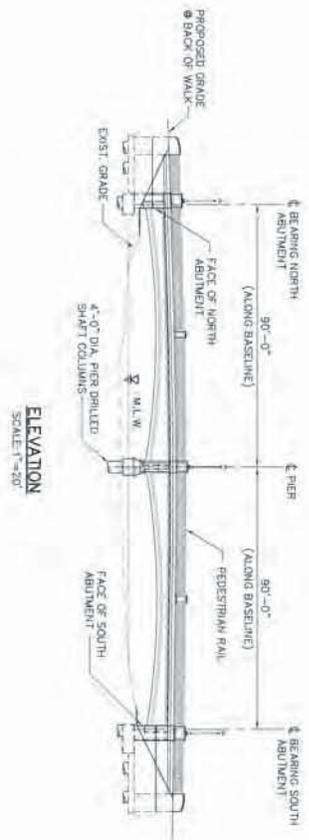


**COMMONWEALTH**  
DEPARTMENT OF TRANSPORTATION  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383  
WARWICK & WEST WARWICK, RHODE ISLAND

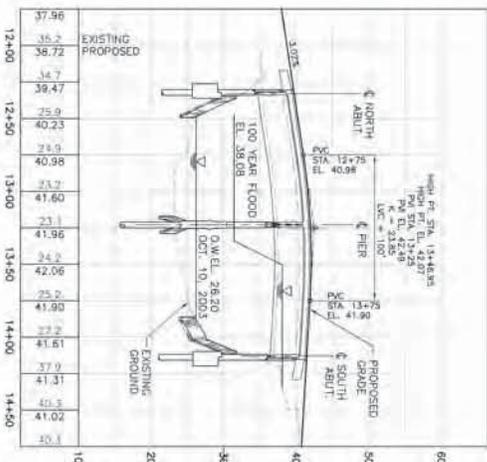
NO.	DATE	BY	REVISIONS
1	08/27/2025	JKS	

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

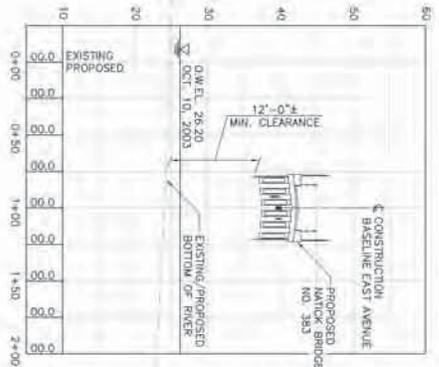
SCALE: 1"=10'



**ELEVATION**  
 SCALE: 1"=20'



**EAST AVENUE PROFILE**  
 SCALE: 1"=40' (HORIZ)  
 1"=8' (VERT.)



**PROFILE ALONG PAWTUXET RIVER**  
 SCALE: 1"=40' (HORIZ)  
 1"=8' (VERT.)



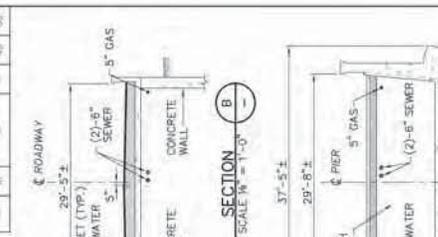
NO.	DATE	BY	REVISIONS
1	10/11/17	[Name]	ISSUE FOR CONSTRUCTION

RHODE ISLAND  
 DEPARTMENT OF TRANSPORTATION  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 283  
 WARWICK & WEST WARWICK, RHODE ISLAND

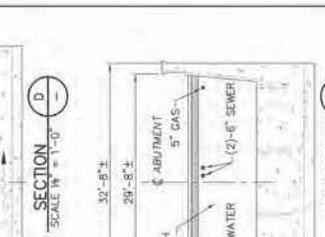
PROJECT: PROFILES & ELEVATION  
 SHEET: 1 OF 1  
 DATE: 10/11/17



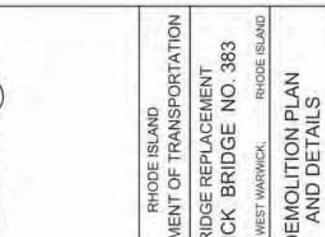
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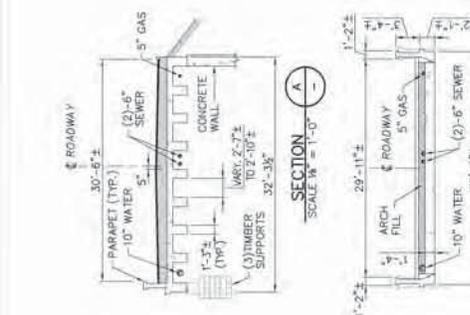
**DEMOLITION PLAN**  
SCALE 1"=20'



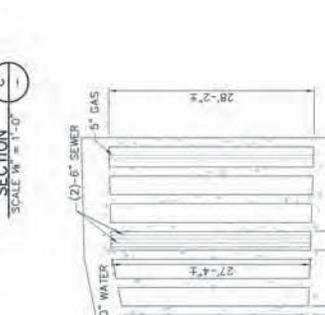
**SOUTH ELEVATION**  
SCALE 1/8"=1'-0"



**NORTH ELEVATION**  
SCALE 1/8"=1'-0"



**SECTION A**  
SCALE 1"=1'-0"



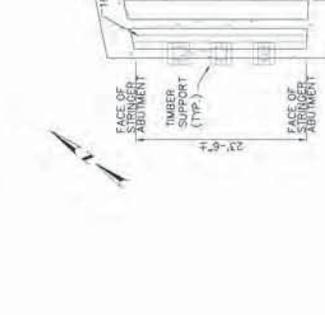
**SECTION B**  
SCALE 1"=1'-0"



**SECTION C**  
SCALE 1"=1'-0"



**SECTION D**  
SCALE 1"=1'-0"



**SECTION E**  
SCALE 1"=1'-0"



**STRINGER SPAN PLAN**  
SCALE 1"=1'-0"

- DEMOLITION NOTES:**
1. THE INFORMATION SHOWN ON THIS SHEET IS BASED ON ORIGINAL PLANS & FIELD MEASUREMENTS. PLANS FOR THE ORIGINAL DESIGN ARE AVAILABLE ON CONTRACT CD.
  2. THE ENTIRE SUPERSTRUCTURE AND SUBSTRUCTURE ARE TO BE REMOVED AND DISPOSED IN THEIR ENTIRETY TO A DEPTH OF ONE FOOT BELOW THE EXISTING GRADE OR THE PROPOSED FINISH GRADE ELEVATION, (WHICHEVER IS GREATER).
  3. THE EXISTING ELEVATIONS AND SECTIONS PROVIDED ARE FOR INFORMATIONAL PURPOSES ONLY, AND MAY VARY.
  4. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXISTING BRIDGE CONSTRUCTION.
  5. REFER TO PHASE CONSTRUCTION PLAN-1 & 2 FOR LIMITS OF DISTURBANCE, STAKED HAY BALES & TEMPORARY CORFERRAMS.

REVISIONS	NO.	DATE	BY

RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION  
BRIDGE REPLACEMENT  
NATICK BRIDGE NO. 383  
WARWICK & WEST WARWICK, RHODE ISLAND

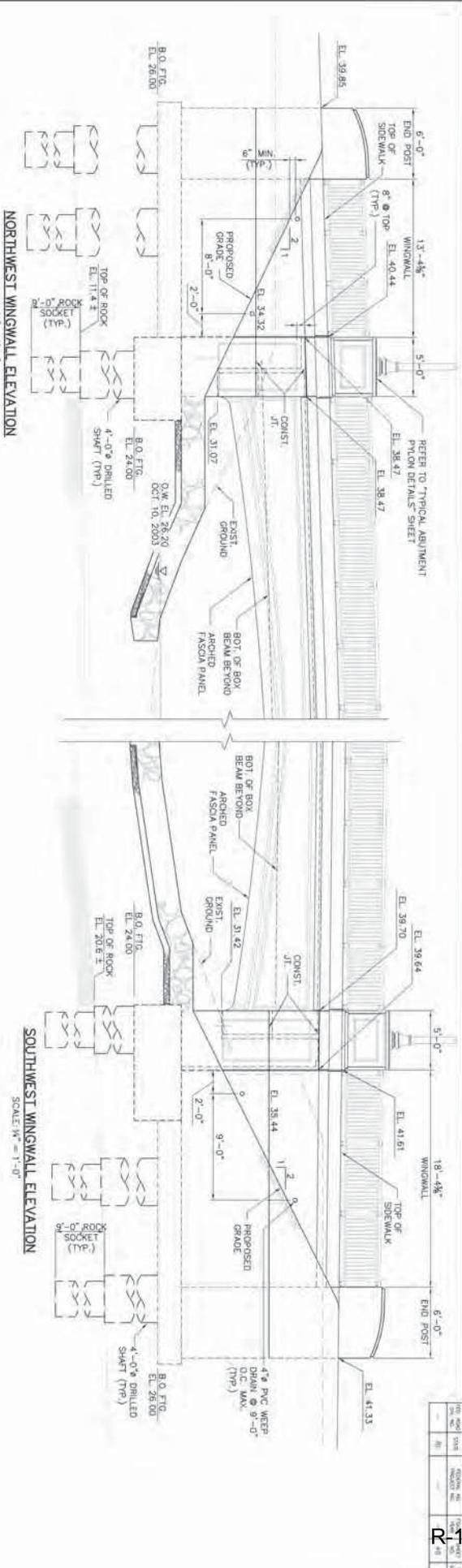
**COMMONWEALTH**  
CONSTRUCTION & MAINTENANCE  
INDUSTRIAL, INC.

DEMOLITION PLAN  
AND DETAILS

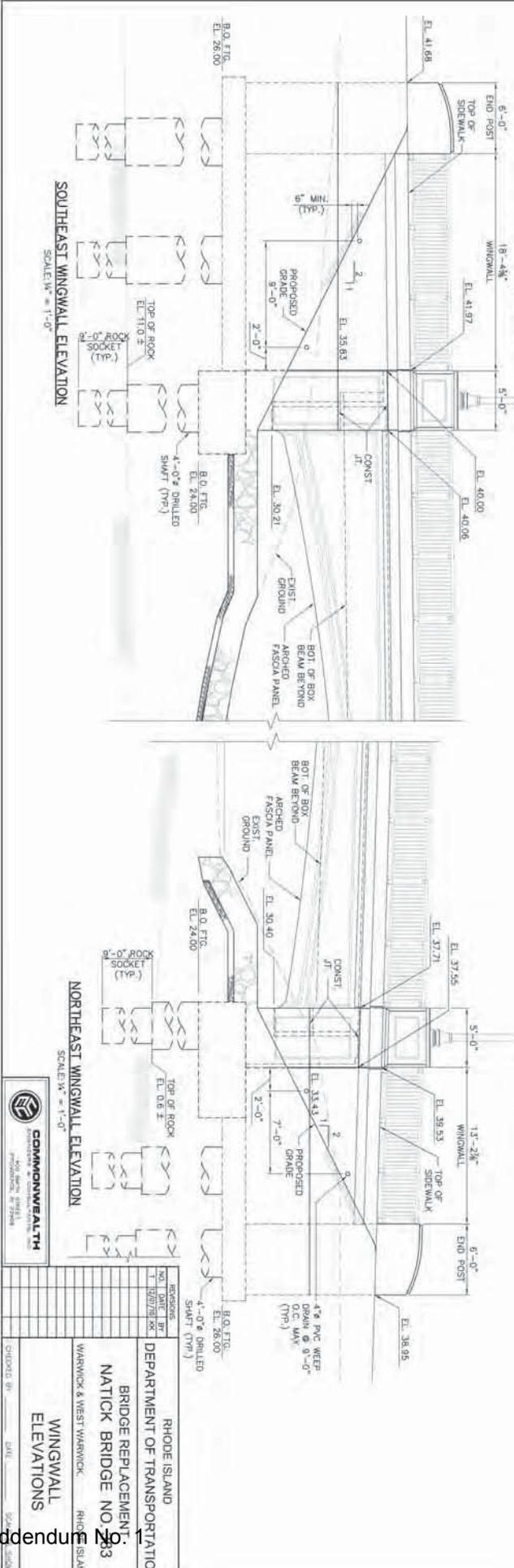








NORTHWEST WINGWALL ELEVATION  
SCALE: 1/4" = 1'-0"



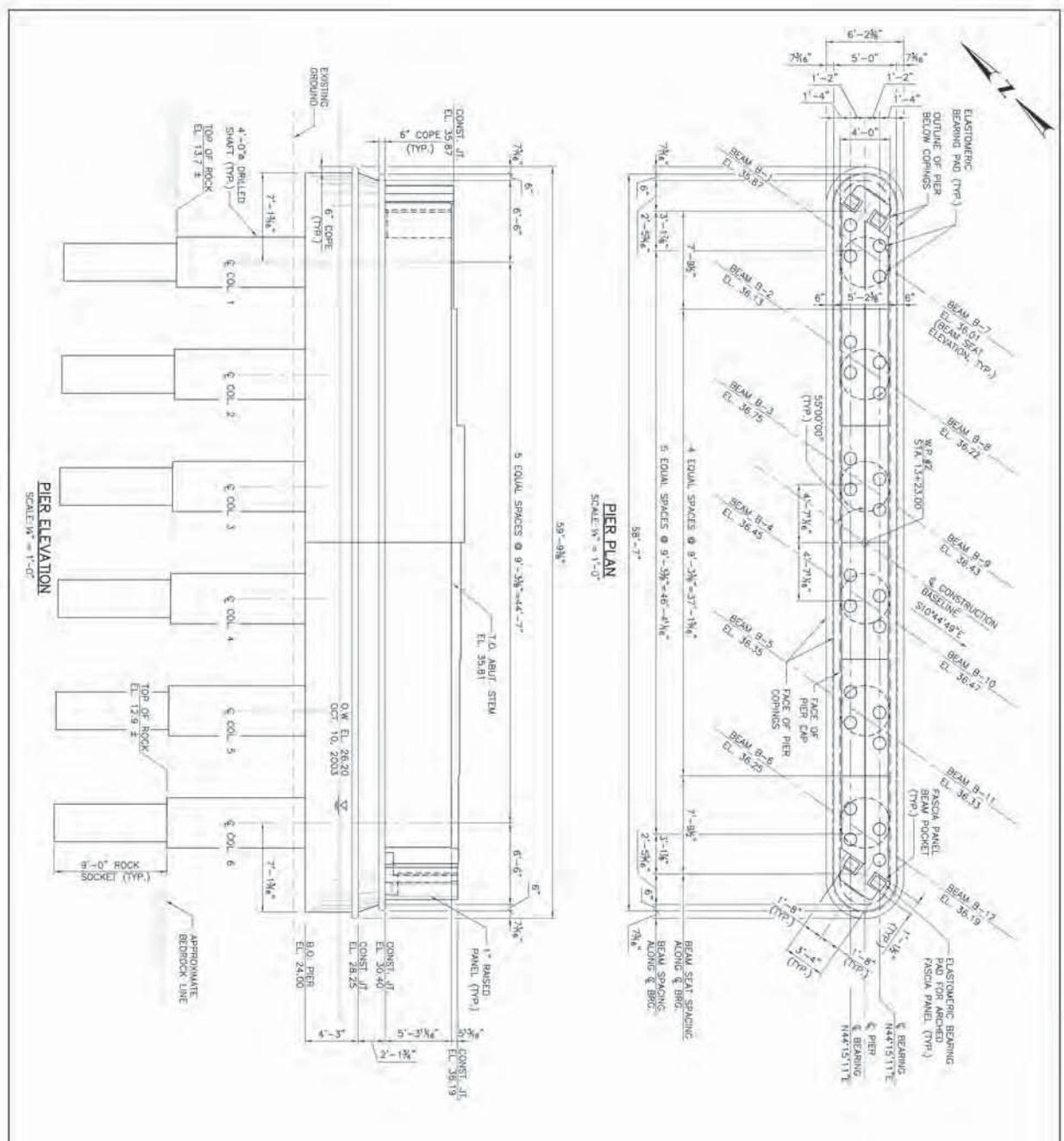
SOUTHWEST WINGWALL ELEVATION  
SCALE: 1/4" = 1'-0"

NORTHEAST WINGWALL ELEVATION  
SCALE: 1/4" = 1'-0"

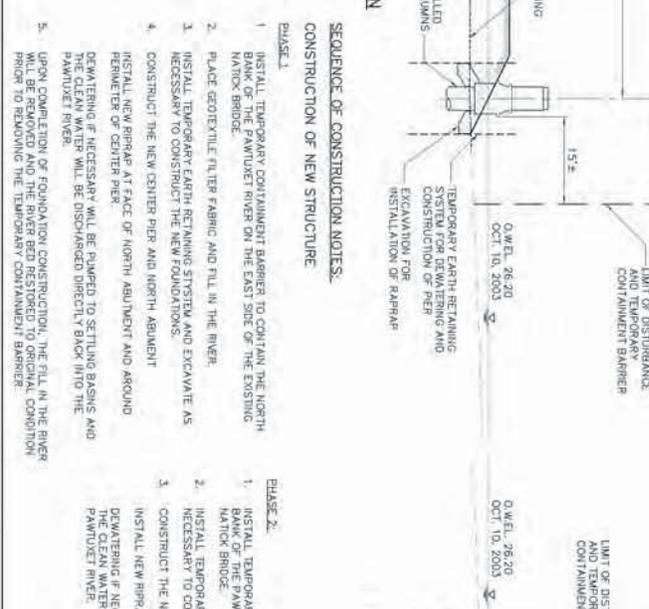
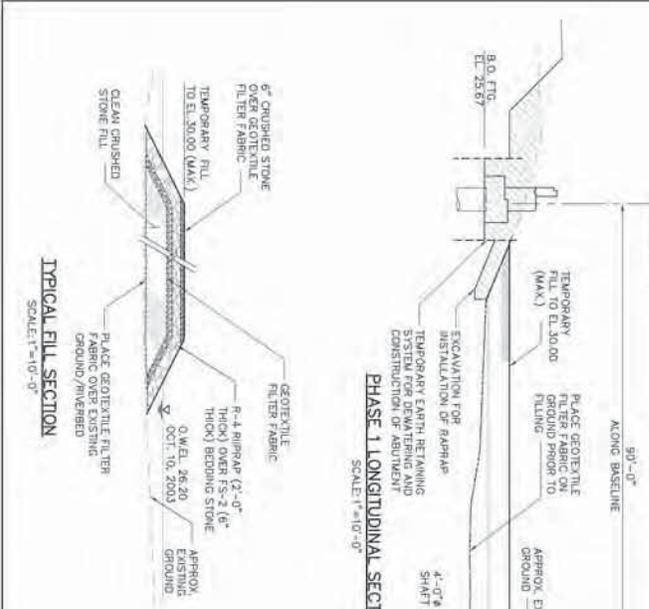
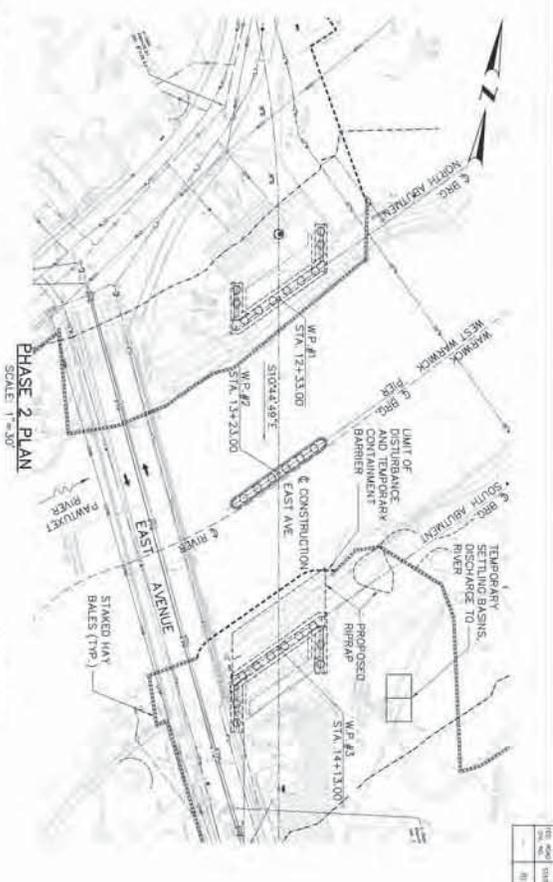
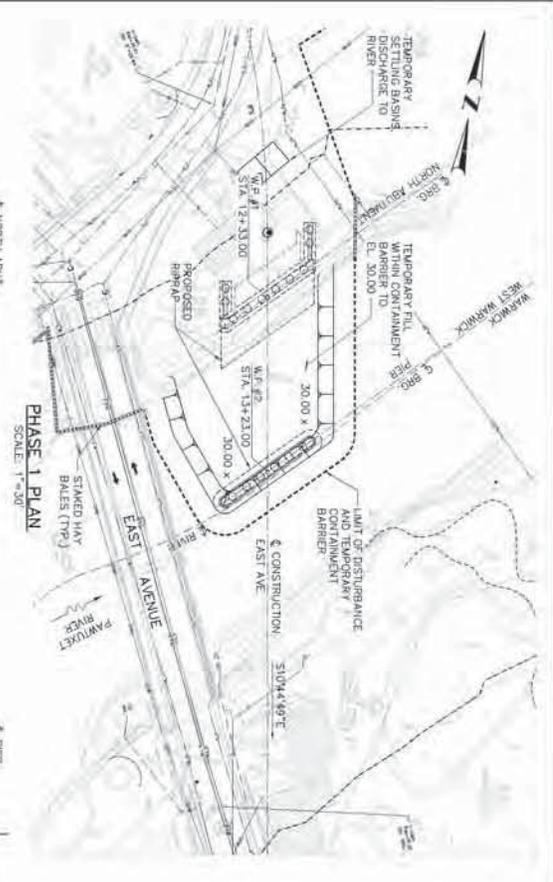
NO.	DATE	BY	REVISIONS
1	05/27/2005	JKS	

RHODE ISLAND  
 DEPARTMENT OF TRANSPORTATION  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 83  
 WARWICK & WEST WARWICK  
 RHODE ISLAND  
 WINGWALL  
 ELEVATIONS

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SCALE: 1/4" = 1'-0"



DEPARTMENT OF TRANSPORTATION BRIDGE REPLACEMENT NATICK BRIDGE NO. 283 WARWICK & WEST WARWICK RHODE ISLAND	
NO. DATE BY 1 06/27/2005	REVISIONS
PROJECT NO. 00000000	DRAWING NO. 00000000
SHEET NO. 00000000	TOTAL SHEETS 00000000
DATE 06/27/2005	SCALE AS SHOWN
<b>PIER PLAN &amp; ELEVATION</b>	



**SEQUENCE OF CONSTRUCTION NOTES.**

**CONSTRUCTION OF NEW STRUCTURE**

**PHASE 1**

1. INSTALL TEMPORARY CONTAINMENT BARRIER TO CONTAIN THE NORTH BANK OF THE PANUOKET RIVER ON THE EAST SIDE OF THE EXISTING NATICK BRIDGE.
2. PLACE GEOTEXTILE FILTER FABRIC AND FILL IN THE RIVER.
3. INSTALL TEMPORARY EARTH RETAINING SYSTEM AND EXCAVATE AS NECESSARY TO CONSTRUCT THE NEW FOUNDATIONS.
4. CONSTRUCT THE NEW CENTER PIER AND NORTH ABUTMENT.
5. INSTALL NEW RAPPAP AT FACE OF NORTH ABUTMENT AND AROUND DEWATERING IF NECESSARY WILL BE PUMPED TO SETTLING BASINS AND THE CLEAN WATER WILL BE DISCHARGED DIRECTLY BACK INTO THE PANUOKET RIVER.

**PHASE 2**

1. INSTALL TEMPORARY CONTAINMENT BARRIER TO CONTAIN THE SOUTH BANK OF THE PANUOKET RIVER ON THE EAST SIDE OF THE EXISTING NATICK BRIDGE.
2. INSTALL TEMPORARY EARTH RETAINING SYSTEM AND EXCAVATE AS NECESSARY TO CONSTRUCT THE NEW SOUTH ABUTMENT.
3. CONSTRUCT THE NEW SOUTH ABUTMENT.
4. INSTALL NEW RAPPAP AT FACE OF SOUTH ABUTMENT.
5. DEWATERING IF NECESSARY WILL BE PUMPED TO SETTLING BASINS AND THE CLEAN WATER WILL BE DISCHARGED DIRECTLY BACK INTO THE PANUOKET RIVER.

**NOTES:**

1. REFER TO SPECIAL PROVISIONS ITEM CODE 805.99 TEMPORARY EARTH RETAINING SYSTEMS AND TEMPORARY CONTAINMENT BARRIER FOR FURTHER INFORMATION.
2. ONCE A STORM FLOOD EVENT HAS BEEN PREDICTED TO REMOVE EQUIPMENT AND MATERIALS FROM THE TEMPORARY CONSTRUCTION ACCESS FILL AREA SHOWN UNDER THE PHASE 1 CONSTRUCTION SEQUENCE. THE MATERIALS SHOULD BE STORED TO PREVENT COLLAPSE. MATERIALS SHOULD BE CONSTRUCTED FROM WASHING DOWN STREAM.
3. ALL SETTLING BASINS SHALL BE CLEANED OUT ON A WEEKLY BASIS.

**REVISIONS**

NO.	DATE	BY	REVISION
1	08/27/2013		

**DEPARTMENT OF TRANSPORTATION**  
**BRIDGE REPLACEMENT**  
**NATICK BRIDGE NO. 893**  
 WARWICK & WEST WARWICK, RHODE ISLAND

PHASE 1  
**CONSTRUCTION PLAN 1**

DATE: 01-23-2013  
 SCALE: 1"=10'-0"





NO. OF TESTS	NO. OF TESTS	NO. OF TESTS	NO. OF TESTS
—	—	—	—
—	—	—	—
—	—	—	—

NO.	DATE	BY	REMARKS
1	01/18/11	SL	Initial test results
2	01/18/11	SL	Initial test results
3	01/18/11	SL	Initial test results
4	01/18/11	SL	Initial test results
5	01/18/11	SL	Initial test results
6	01/18/11	SL	Initial test results
7	01/18/11	SL	Initial test results
8	01/18/11	SL	Initial test results
9	01/18/11	SL	Initial test results
10	01/18/11	SL	Initial test results
11	01/18/11	SL	Initial test results
12	01/18/11	SL	Initial test results
13	01/18/11	SL	Initial test results
14	01/18/11	SL	Initial test results
15	01/18/11	SL	Initial test results
16	01/18/11	SL	Initial test results
17	01/18/11	SL	Initial test results
18	01/18/11	SL	Initial test results
19	01/18/11	SL	Initial test results
20	01/18/11	SL	Initial test results

NO.	DATE	BY	REMARKS
1	01/18/11	SL	Initial test results
2	01/18/11	SL	Initial test results
3	01/18/11	SL	Initial test results
4	01/18/11	SL	Initial test results
5	01/18/11	SL	Initial test results
6	01/18/11	SL	Initial test results
7	01/18/11	SL	Initial test results
8	01/18/11	SL	Initial test results
9	01/18/11	SL	Initial test results
10	01/18/11	SL	Initial test results
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12	01/18/11	SL	Initial test results
13	01/18/11	SL	Initial test results
14	01/18/11	SL	Initial test results
15	01/18/11	SL	Initial test results
16	01/18/11	SL	Initial test results
17	01/18/11	SL	Initial test results
18	01/18/11	SL	Initial test results
19	01/18/11	SL	Initial test results
20	01/18/11	SL	Initial test results

NO.	DATE	BY	REMARKS
1	01/18/11	SL	Initial test results
2	01/18/11	SL	Initial test results
3	01/18/11	SL	Initial test results
4	01/18/11	SL	Initial test results
5	01/18/11	SL	Initial test results
6	01/18/11	SL	Initial test results
7	01/18/11	SL	Initial test results
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13	01/18/11	SL	Initial test results
14	01/18/11	SL	Initial test results
15	01/18/11	SL	Initial test results
16	01/18/11	SL	Initial test results
17	01/18/11	SL	Initial test results
18	01/18/11	SL	Initial test results
19	01/18/11	SL	Initial test results
20	01/18/11	SL	Initial test results

RHODE ISLAND  
 DEPARTMENT OF TRANSPORTATION  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383  
 WARWICK & WEST WARWICK, RHODE ISLAND  
 TEST BORINGS  
 B-6 THRU B-8  
 CHECKED BY: DATE: SCALE: 80%



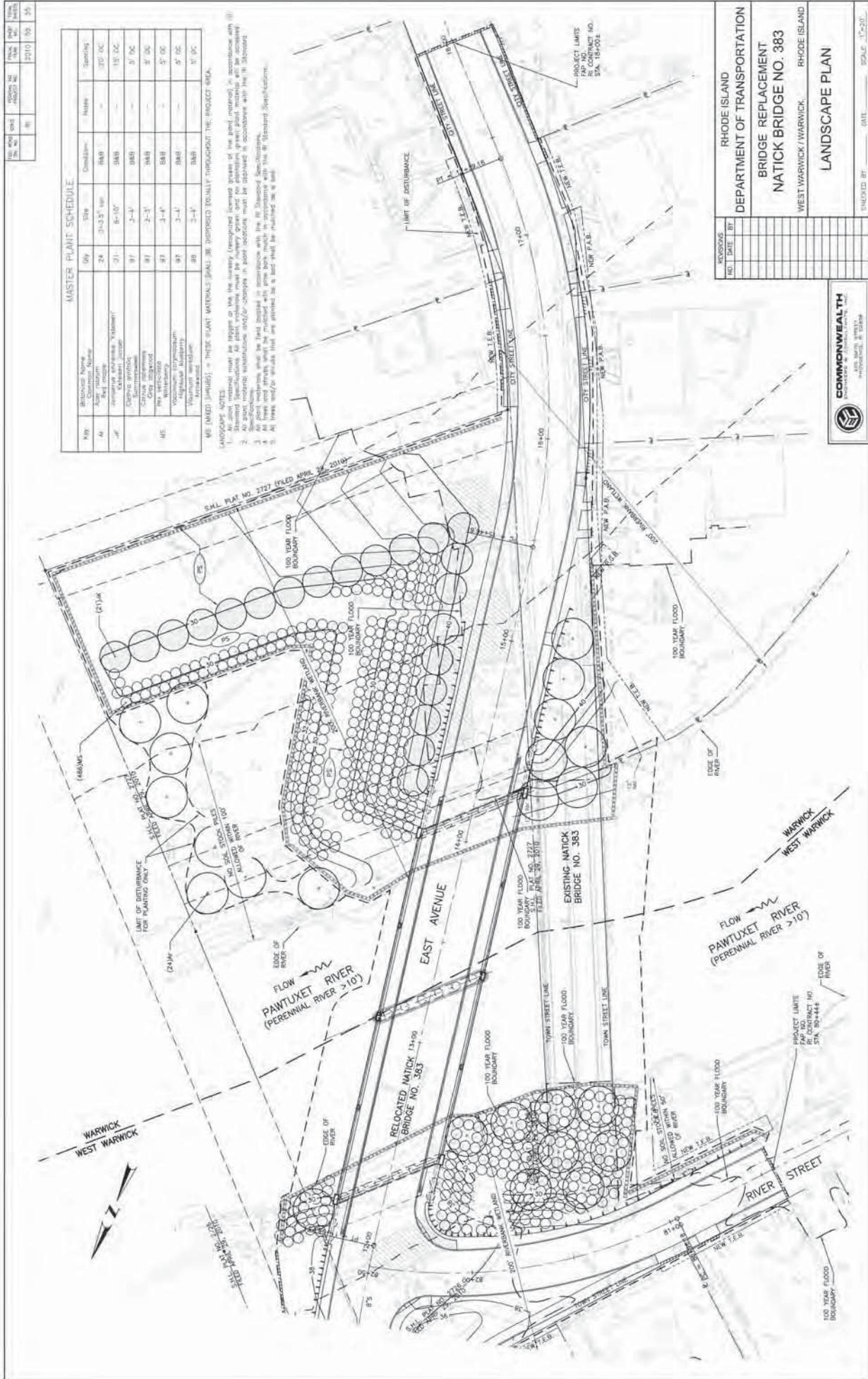
DATE	BY	REVISION
2010	SS	2010
2010	SS	2010

MASTER PLANT SCHEDULE

NO.	DESCRIPTION	Qty	SIZE	CONDITION	INSTALL	SPACING
1	Aspl. concrete	24	36x36" dia.	MBB	MBB	20' OC
2	Aspl. concrete	21	18x10"	MBB	MBB	15' OC
3	Aspl. concrete	87	3x4"	MBB	MBB	3' OC
4	Aspl. concrete	87	2x3"	MBB	MBB	3' OC
5	Aspl. concrete	87	3x4"	MBB	MBB	3' OC
6	Aspl. concrete	87	3x4"	MBB	MBB	3' OC
7	Aspl. concrete	87	3x4"	MBB	MBB	3' OC
8	Aspl. concrete	87	3x4"	MBB	MBB	3' OC

LANDSCAPE NOTES

- All plant material must be installed in the nursery (prespecified) system of the plant material, in accordance with the manufacturer's instructions.
- All plant material shall be installed in the nursery in accordance with the manufacturer's instructions.
- All plant material shall be installed in the nursery in accordance with the manufacturer's instructions.
- All trees and shrubs shall be installed with the following specifications:
- All trees and/or shrubs that are planted in a bed shall be installed in a bed.



RHODE ISLAND  
 DEPARTMENT OF TRANSPORTATION  
 BRIDGE REPLACEMENT  
 NATICK BRIDGE NO. 383  
 WEST WARWICK / WARWICK, RHODE ISLAND  
 LANDSCAPE PLAN

COMMONWEALTH OF RHODE ISLAND  
 PROFESSIONAL LANDSCAPE ARCHITECT  
 JOHN J. BROWN, III, AIA, ASLA

**Appendix E**

Contract Specifications

## CODE 202.99 SCREENING IMPORTED SOILS FOR CONTAMINATION

### DESCRIPTION

The work consists of obtaining and screening soil samples from soil sources to be imported and incorporated into the Project. Soil source samples shall be analyzed for certain contaminants as outlined in these Special Provisions and in accordance with the Soil Management Plan (SMP), the Remedial Action Work Plan (RAWP), the Contract Drawings, and in a manner satisfactory to the Engineer. The Contractor shall provide submittals, sampling and laboratory testing as outlined in these Special Provisions prior to the delivery of soils to the Project.

### SUBMITTALS

Prior to commencing construction, the Contractor shall submit to the Engineer a list of soil sources for each classification of soil outlined in these Special Provisions to be imported and incorporated into the Project. The list for each soil classification shall state the location of material, Owner, anticipated quantity of soil to be imported, material state (in situ, stockpiled), material condition (virgin, processed, reclaimed, recycled from another Project) and any know environmental history associated with material condition. Include with list any existing analytical results of soil source.

Prior to commencing construction, the Contractor shall submit to the Engineer a Sampling and Analytical Work Plan (SAWP) outlining the methodology used to collect, preserve, analyze and report soil sample results. As minimum, the SAWP shall include:

- Sample collection methods including a description of sampling equipment, grab sample size and how representative grab samples will be obtained from in situ undeveloped and developed borrow sources and/or from stockpiled processed, reclaimed and/or recycled borrow sources;
- Procedures for decontamination of sampling equipment prior to and between obtaining successive samples;
- Sample container, storage and preservation procedures and holding times;
- Sample handling, packaging, and transportation protocols;
- Sample documentation (labeling, chain-of-custody, log book); and
- Sampling and analysis quality assurance/quality control procedures.

The Contractor shall provide third party soil sampling with all samples analyzed at an analytical laboratory who meets the minimum requirements and guidelines to conduct chemical analysis, as developed by the EPA. The analytical laboratory shall be

approved/certified by the Rhode Island Department of Environmental Management. The detection limit for all analytical results shall be below the acceptance criteria outlined in this Special Provision.

The soil sampling frequency (which is dependent on soil borrow source and contaminant) and a list of contaminants to be analyzed for each soil classification are as outlined in this Special Provision. The Contractor shall submit to the Engineer copies of all imported source soil analytical results, applicable QA/QC data and chains of custody 72-hours-in-advance-of-delivery-of-soils-to-Project.

## **MATERIALS AND PERSONNEL**

The Contractor shall be responsible for furnishing all equipment, personnel and subcontractors required to complete and submit soil testing required in this Special Provisions.

All materials to be used shall be in accordance with all appropriate sections of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition, and all revisions.

## **TESTING**

1. Soil imported to the Project for use as Item Code 202.0700 Common Borrow, Item Code 202.0800 Gravel Borrow, Item Code 203.0600 Fill Gravel Borrow Under Structures or Item Code 203.0700 Pervious Fill used up to a non-impervious finished grade or to subgrade of an impervious surface shall be shown to have an average contaminant level below the Rhode Island Department of Environmental Management (RIDEM) Method 1 RIDEM Residential Direct Exposure Criteria (RDEC) for TPH, VOC, SVOCs (16 PAH priority pollutants only) and RCRA 8 Metals<sup>2</sup> prior to delivery to the Project.

Soil imported from a non-developed borrow source shall be tested at a frequency<sup>2</sup> of 1 sample for every 5,000 cubic yards of in situ soil with a minimum of 2 samples per borrow source. Soil imported from another project or developed borrow source shall be tested at a frequency<sup>2</sup> of 1 sample for every 2,000 cubic yards with a minimum of 2 samples per borrow source. Contaminants to be tested, the test methods and acceptance shall be as outlined in the following table:

<b>Contaminant</b>	<b>Test Method</b>	<b>Acceptance Criteria</b>
TPH	EPA Method 8100M	Below RIDEM Method 1 RDEC
VOC	EPA Method 8260	Below RIDEM Method 1 RDEC
SVOCs (16 PAHs only)	EPA Method 8270	Below RIDEM Method 1 RDEC
RCRA Eight Metals <sup>2</sup>	EPA Methods 6010 and 7471A	Below RIDEM Method 1 RDEC

1. Item Code 302.0100 Gravel Borrow Subbase shall not require testing.

2. The only exception is Arsenic, wherein the acceptance and sampling frequency criteria include the following:
  - No individual sample result shall be greater than 15 mg/kg;
  - A minimum of 10 soil samples per first 2000 cubic yards with 2 additional soil samples per each additional 2000 cubic yards of borrow source;
  - No greater than 10% of sample results shall exceed 7.0 mg/kg; and
  - The average of all sample results shall be 7.0 mg/kg or less.

2. Soil imported to the Project for use as Item Code L01.0102 Loam Borrow or Item Code L01.0104 Plantable Soil shall be shown to have an average contaminant level below the RIDEM Residential Direct Exposure Criteria (RDEC) for TPH, VOC, SVOCs (16 PAH priority pollutants only) and RCRA Eight Metals<sup>1</sup> prior to delivery to the Project. Soil shall be tested at a frequency<sup>1</sup> of 1 sample for every 2,000 cubic yards with a minimum of 2 samples per borrow source. Contaminants to be tested, the test methods and acceptance shall be as outlined in the following table:

Contaminant	Test Method	Acceptance Criteria
TPH	EPA Method 8100M	Below RIDEM Method 1 RDEC
VOC	EPA Method 8260	Below RIDEM Method 1 RDEC
SVOCs (16 PAHs only)	EPA Method 8270	Below RIDEM Method 1 RDEC
RCRA Eight Metals <sup>1</sup>	EPA Methods 6010 and 7471A	Below RIDEM Method 1 RDEC

1. The only exception is Arsenic, wherein the acceptance and sampling frequency criteria include the following:
  - No individual sample result shall be greater than 15 mg/kg;
  - A minimum of 10 soil samples per first 2000 cubic yards with 2 additional soil samples per each additional 2000 cubic yards of borrow source;
  - No greater than 10% of sample results shall exceed 7.0 mg/kg; and
  - The average of all sample results shall be 7.0 mg/kg or less.
3. Soil imported to the Project for use as Item Code 303.01. Special Graded Aggregate for Shaping and Trimming Driveways or Shoulders or Item Code 301.9902 Crushed Stone Surface Treatment used in top 2 feet of final grades shall be shown to have an average contaminant level below the Rhode Island Department of Environmental Management (RIDEM) Method 1 Residential Direct Exposure Criteria (RDEC) for TPH, VOC, SVOCs (16 PAH priority pollutants only) and RCRA Eight Metals<sup>1</sup> prior to delivery to the Project.

Soil shall be tested at a frequency<sup>1</sup> of 1 sample for every 2,000 cubic yards with a minimum of 2 samples per borrow source. Contaminants to be tested, the test methods and acceptance shall be as outlined in the following table:

Contaminant	Test Method	Acceptance Criteria
TPH	EPA Method 8100M	Below RIDEM Method 1 RDEC
VOC	EPA Method 8260	Below RIDEM Method 1 RDEC
SVOCs (16 PAHs only)	EPA Method 8270	Below RIDEM Method 1 RDEC
RCRA Eight Metals <sup>1</sup>	EPA Methods 6010 and 7471A	Below RIDEM Method 1 RDEC

1. The only exception is Arsenic, wherein the acceptance and sampling frequency criteria include the following:

- No individual sample result shall be greater than 15 mg/kg;
- A minimum of 10 soil samples per first 2000 cubic yards with 2 additional soil samples per each additional 2000 cubic yards of borrow source;
- No greater than 10% of sample results shall exceed 7.0 mg/kg; and
- The average of all sample results shall be 7.0 mg/kg or less.

### ACCEPTANCE CRITERIA

Contaminant	RDEC (mg/kg)	I/C DEC (mg/kg)	Contaminant	RDEC (mg/kg)	I/C DEC (mg/kg)
<b>Volatile Organic Compounds</b>					
Acetone	7,800	10,000	Ethylene dibromide (EDB)	0.01	0.07
Benzene	2.5	200	Isopropyl benzene	27	10,000
Bromodichloromethane	10	92	Methyl ethyl ketone	10,000	10,000
Bromoform	81	720	Methyl isobutyl ketone	1200	10,000
Bromomethane	0.8	2900	Methyl tertiary-butyl ether (MTBE)	390	10,000
Carbon tetrachloride	1.5	44	Methylene chloride	45	760
Chlorobenzene	210	10,000	Styrene	13	190
Chloroform	1.2	940	1,1,1,2-Tetrachloroethane	2.2	220
Dibromochloromethane	7.6	68	1,1,2,2-Tetrachloroethane	1.3	29
1,2-Dibromo-3-chloropropane (DBCP)	0.5	4.1	Tetrachloroethene	12	110
1,1-Dichloroethane	920	10,000	Toluene	190	10,000
1,2-Dichloroethane	0.9	63	1,1,1-Trichloroethane	540	10,000
1,1-Dichloroethene	0.2	9.5	1,1,2-Trichloroethane	3.6	100
cis-1,2-Dichloroethene	630	10,000	Trichloroethene	13	520
Trans-1,2-Dichloroethene	1,100	10,000	Vinyl chloride	0.02	3.0

1,2-Dichloropropane	1.9	84	Xylenes (Total)	110	10,000
Ethylbenzene	71	10,000			
<b>Semi-Volatiles</b>					
Acenaphthene	43	10,000	2,4-Dimethyl phenol	1,400	10,000
Acenaphthylene	23	10,000	Dimethyl phthalate	1900	10,000
Anthracene	35	10,000	2,4-Dinitrophenol	160	4,100
Benzo(a)anthracene	0.9	7.8	2,4-Dinitrotoluene	0.9	8.4
Benzo(a)pyrene	0.4	0.8	Fluoranthene	20	10,000
Benzo(b)fluoranthene	0.9	7.8	Fluorene	28	10,000
Benzo(g,h,i)perylene	0.8	10,000	Hexachlorobenzene	0.4	3.6
Benzo(k)fluoranthene	0.9	78	Hexachlorobutadiene	8.2	73
1,1-Biphenyl	0.8	10,000	Hexachloroethane	46	410
Bis(2-ethylhexyl)phthalate	46	410	Indeno(1,2,3-cd)pyrene	0.9	7.8
Bis(2-chloroethyl)ether	0.6	5.2	2-Methyl naphthalene	123	10,000
Bis(2-chloroisopropyl)ether	9.1	82	Naphthalene	54	10,000
4-Chloroaniline (p-)	310	8200	Pentachlorophenol	5.3	48
2-Chlorophenol	50	10,000	Phenanthrene	40	10,000
Chrysene <sup>a</sup>	0.4	780			
Dibenzo(a,h)anthracene	0.4	0.8	Phenol	6,000	10,000
1,2-Dichlorobenzene (o-DCB)	510	10,000	Pyrene	13	10,000
1,3-Dichlorobenzene (m-DCB)	430	10,000	1,2,4-Trichlorobenzene	96	10,000
1,4-Dichlorobenzene (p-DCB)	27	240	2,4,5-Trichlorophenol	330	10,000
<b>Substance</b>	<b>RDEC (mg/kg)</b>	<b>I/C DEC (mg/kg)</b>	<b>Substance</b>	<b>RDEC (mg/kg)</b>	<b>I/C DEC (mg/kg)</b>
<b>Semi-Volatiles (Cont'd)</b>					
3,3-Dichlorobenzidine	1.4	13	2,4,6-Trichlorophenol	58	520
2,4-Dichlorophenol	30	6,100			
Diethyl phthalate	340	10,000			
<b>RCRA 8 Metals</b>					
<sup>b</sup> Arsenic	7.0	7.0	<sup>c</sup> Lead	150	500
Barium	5,500	10,000	Mercury	23	610
Cadmium	39	1,000	Selenium	390	10,000
Chromium III (Trivalent)	1,400	10,000	Silver	200	10,000
Chromium VI (Hexavalent)	390	10,000			

Soil Criteria as presented is based on the RI DEM Method 1 Criteria. See notes below for qualifiers

<sup>a</sup> Estimated quantitation limits

<sup>b</sup> Background Levels of Priority Pollutant Metals In Rhode Island Soils, T. O'Connor, RIDEM. For arsenic, see Section 12.0

<sup>c</sup> Direct exposure criteria for Lead consistent with the Rhode Island Department of Health Rules and Regulations for Lead Poisoning Prevention [R23-24.6-PB], as amended

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#### **METHOD OF MEASUREMENT**

This item will not be measured for payment.

#### **BASIS OF PAYMENT**

No separate payment will be made for this item. Costs for this item shall be included in the bid prices of the appropriate items as listed in the Proposal.

CODE 202.9901 HANDLING, HAULING, AND STOCKPILE  
MANAGEMENT OF CONTAMINATED SOILS AND UNCLASSIFIED SOILS

**DESCRIPTION:**

This item of work includes requirements of the RIDEM approved Remedial Action Work Plan (RAWP) and the Soil Management Plan (SMP), including but not limited to: maintaining existing or proposed chain link fencing (as applicable) for excavation locations, temporary staging areas and soil stockpiles; furnishing, installing and removing of temporary barrier fencing for excavation locations, temporary staging areas and temporary soil stockpiles, as applicable; the special handling, hauling, unloading and stockpile management of unclassified, contaminated or hazardous soil from the excavation location to the approved stockpile/testing location(s); the management of site security/access; the setup, maintenance and removal of the stockpile locations including above soils, polyethylene sheeting, hay bales and temporary barrier fencing; work and contingency plan supplies; equipment; site maintenance; dust control; and returning site to a condition acceptable to the Engineer. The work shall be performed in accordance with all appropriate sections of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition, all revisions of the RIDEM approved Remedial Action Work Plan (RAWP), the Soil Management Plan (SMP) and in compliance with all applicable permits.

Excavation of unclassified, contaminated or hazardous soil shall be measured and paid for under the appropriate Bid Items. Chain link fencing shall be measured and paid for under appropriate Bid Items. Hay bales shall be measured and paid for under appropriate Bid Items.

**HEALTH AND SAFETY PLAN:**

The Contractor shall produce, submit to Engineer and maintain a site specific Health and Safety Plan (HASP) in compliance with the Occupational Safety and Health Administration (OSHA) Standards defined in 29 CFR 1910.120. The project HASP shall be implemented as part of this work.

The Contractor's employees and Subcontractor's employees who will be potentially exposed to the subsurface soils in the RAWP are required to have OSHA 40-hour health and safety training and the 8 hour refresher training, if applicable. The Contractor shall provide training certificates to the Engineer for the persons that will be performing the work.

If visible dust is generated, the level of dermal and respiratory protection shall be determined based upon periodic air monitoring to be performed by the Contractor and the requirements of the Project specific HASP. The Engineer may conduct duplicate air monitoring for quality assurance purposes. Level D protection shall be the minimum personal protective level for all on Project personnel.

**APPLICABLE LAWS AND REGULATIONS:**

The management of site security/access, excavation, removal, stockpiling, and transportation of unclassified, contaminated or hazardous soil shall be conducted in accordance with the Environmental Protection Agency (EPA) and the Rhode Island Department of Environmental Management (RIDEM) regulations, the RIDEM approved RAWP and SMP, and in compliance with all applicable permits.

The Contractor shall ensure that compliance with site security/access requirements in accordance with the SMP and applicable regulations are maintained during all earthwork operations. The Contractor shall be required to maintain a daily field/operating report during the earthwork activities in accordance with the SMP and RAWP to include, but not be limited to, dates of earthwork activities, dates and times of field sampling, soil management observations, and tracking related to stockpile generation as well as paperwork documenting lawful off-site disposition. The Contractor shall submit the report to the Engineer on a daily basis to document the operations associated with earthwork activities. Copies of the daily field/operating report shall be submitted to the Engineer on a monthly basis by the 15<sup>th</sup> of each month.

In addition to the above, the Contractor is responsible for fencing, erosion and pollution controls in accordance with local, State and Federal regulations as well as what is included in the Contract Documents.

**SUBMITTALS:**

The Contractor shall submit a Soil Excavation and Fill Management Plan to the Engineer for approval stating the times, locations, approximate soil classification (or unclassified soil) and quantities of excavated material that will be generated, the locations of temporary staging areas and temporary stockpiles, if the Contractor elects to create them, and the schedule for placement of fill. The Plan shall also include: a list of all equipment, including sizes and capacities; the sequencing of all soil removal activities; a description of methods used to transport soils to temporary stockpiles; and methods for managing site security and limiting access to excavations, temporary staging areas and soil stockpiles (as applicable). The sequence shall identify specific excavations and earthmoving operations by baseline and stations. The Contractor shall be aware there is limited stockpile capacity within the Project Limits. The Contractor shall sequence his excavation operations so as not to exceed the stockpile capacity. The Contractor shall propose temporary stockpile locations as part of the Plan, as necessary to address reuse of acceptable excavated materials as common borrow within the Project Limits. The Contractor shall coordinate with Engineer for soil testing, temporary stockpiling of excavated materials and stockpile rotation of material for soil to be removed from the Project in accordance with the SMP. Soil sampling and analytical characterization shall be conducted based on reuse of material on site as common borrow and disposal facility requirements.

The Contractor shall maintain copies of the Soil Excavation and Fill Management Plan and daily field/operating report.

The Contractor shall submit a shop drawing on temporary barrier fencing material and installation. Temporary barrier fencing shall be 48" high bright orange polyethylene oval mesh with ingress/egress "gates" complete with posts. Temporary barrier fencing shall be Guardian by Tenax Corp or Model 03-902 by Cortina Safety Products Group or approved equal.

**EQUIPMENT/MATERIALS:**

The Contractor shall supply and use all materials and equipment required to adequately provide and maintain excavation location security/access, minimize the effects of erosion and surface run-off and complete unclassified, contaminated or hazardous soil excavation, handling, hauling, unloading and stockpiling.

The Contractor shall have the necessary personal protective equipment available as specified in the Contractor's site specific Health and Safety Plan and shall have access to an inventory of personal protection equipment in the event that the level of personal protection equipment needs to be upgraded. All materials to be used shall be in accordance with all appropriate sections of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition, and all revisions.

During excavation, handling, hauling, unloading and/or stockpiling, the Contractor shall minimize odors by methods including but not limited to the use of odor suppressant shell material, as necessary or as directed by the Engineer.

**CONSTRUCTION METHODS:**

The Contractor may choose and implement any effective and lawful method for handling hauling, unloading and/or stockpiling unclassified and contaminated soil encountered in the work area provided they perform the required excavation subject to the approval of the Engineer. The Contractor shall assume all responsibility for the adequacy of the methods, materials, documentation, and equipment employed.

The Contractor shall provide fencing with ingress/egress gates around all areas of construction, including all excavations, staging areas and stockpiles, to limit access by unauthorized persons and to protect the public. Provision of fencing shall include the use of existing or proposed chain link fencing or temporary barrier fencing. Temporary barrier fencing shall be used in areas of construction where sufficient chain link fencing has not yet been placed or will not be placed to enclose area to limit access. The Contractor shall install temporary barrier fence, per manufacturer's recommendations. Fencing shall be maintained until the appropriate pavement or 2 foot soil cover has been placed or permanent fencing has been installed.

During excavation of unclassified and contaminated soil the Contractor shall also be required to control dust and sedimentation erosion. Fencing and staked hay bales shall be installed around excavations to minimize the effects of erosion and surface run-off and as shown on the Plans or as directed by the Engineer.

While engaged in unclassified, contamination or hazardous materials removal, the Contractor shall be subject to on-Project inspection by the Engineer. If the work is in violation of the requirements of these Special Provisions, RIDOT will issue a stop work order to be in effect immediately and until the violation is resolved. Standby time and expenses required to resolve the violation shall be at the Contractor's expense.

At all temporary stockpile locations, the Contractor shall maintain and protect from damage existing or proposed chain link fencing (as applicable) or provide temporary barrier fencing prior to commencing with development of soil stockpiles. Prior to commencing with development of all soil stockpiles the Contractor shall also furnish and install erosion control hay bales along the interior perimeter of the fencing.

The Contractor shall supply and utilize all required equipment to adequately place and maintain the stockpiles in a neat and orderly fashion within approved stockpile areas, volume and buffer limitations. All stockpiled unclassified and contaminated soil shall be placed entirely on two layers of 12 mil polyethylene and be completely covered with a 12 mil layer of polyethylene, at the completion of each day. The polyethylene sheets shall overlap adjacent sheets by four feet minimum. Should it be determined that additional stockpile locations are required, the materials and setup required shall be at the Contractor's expense. Stockpile areas selected by the Contractor shall be subject to the approval of the Engineer. It shall be the responsibility of the Contractor to ensure that each stockpile location has been placed on and covered by the required polyethylene, and that the fencing and erosion control hay bales are in place. It shall be the Contractor's responsibility to maintain site security/access, fencing, erosion control hay bales and dust control as required by the Contract Documents and the Soil Management Plan at the stockpile locations and at all areas traveled for the stockpiling operation leading to and from the stockpile areas.

The Contractor shall maintain the unclassified soil stockpile until the soil has been reused to backfill. Excess unclassified stockpile soil shall be tested, classified and approved for legal disposal off-site. See Item Code 202.9902 for testing requirements

The Contractor shall maintain the contaminated soil stockpile until the soil has been tested and approved for legal disposal off-site. See Job Specific Specifications for Code Items 202.9903 thru 202.9907 for testing requirements.

The Contractor shall maintain an inventory of supplies and equipment required to execute the work described herein. This inventory shall also include supplies to be used to implement a contingency plan in the event of unexpected conditions.

After removal of stockpiled soils and upon completion of the use of the stockpile area(s), the Contractor shall remove and dispose of the polyethylene sheeting, hay bales, temporary barrier fencing and restore the stockpile area(s) to a condition acceptable to the Engineer.

**METHOD OF MEASUREMENT:**

This item will not be measured for payment.

**BASIS OF PAYMENT:**

Item 202.9901 "HANDLING, HAULING AND STOCKPILE MANAGEMENT OF CONTAMINATED SOILS" will be paid for at its respective contract unit price per "Lump Sum" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools and equipment, and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

CODE 202.9902 LOAD, HAUL AND DISPOSE SOIL, TYPE A  
CODE 202.9903 LOAD AND HAUL CONTAMINATED SOIL, TYPE 1B  
CODE 202.9904 DISPOSAL OF CONTAMINATED SOIL, TYPE 1B  
CODE 202.9905 LOAD AND HAUL CONTAMINATED SOIL, TYPE 2  
CODE 202.9906 DISPOSAL OF CONTAMINATED SOIL, TYPE 2  
CODE 202.9907 LOAD, HAUL AND DISPOSE CONTAMINATED SOIL, TYPE 3

**DESCRIPTION:**

This item of work includes soil management special handling, loading and hauling of unclassified, contaminated or hazardous soil, and disposal at an off-Project Industrial/Commercial property, recycling or disposal facility in accordance with RIDEM regulations for recycling/disposal of these materials and as directed by the Engineer.

During the course of Project construction unclassified and contaminated soil shall be excavated. Soils within the limits of the Project have been documented to be contaminated with elevated levels of total petroleum hydrocarbons (TPH), semi-volatile organic compounds (SVOCs), and metals (arsenic and/or lead). Available analytical data is shown in the summary tables included in the Appendices of the General Provisions Contract Specific, the Soil Management Plan (SMP) and Remedial Action Work Plan (RAWP). Locations where contamination has been identified as Soil Types are shown in the SMP. Access to the Project shall be limited to authorized individuals to protect the public from exposure to contaminated soils.

Excavation, handling, loading, hauling, stockpiling and disposal of unclassified soil shall be measured and paid for under the appropriate Bid Item.

**APPLICABLE LAWS AND REGULATIONS:**

The management of site security/access, excavation, removal, stockpiling, and transportation of unclassified, contaminated or hazardous soil shall be conducted in accordance with the Environmental Protection Agency (EPA) and the Rhode Island Department of Environmental Management (RIDEM) regulations, the RIDEM approved RAWP and SMP, and in compliance with all applicable permits.

The Contractor shall ensure that compliance with site security/access requirements in accordance with the SMP and applicable regulations are maintained during all earthwork operations. The Contractor shall maintain copies of the Soil Excavation and Fill Management Plan and daily field/operating report. The daily field/operating report shall be submitted to the Engineer daily to document the operations associated with earthwork activities.

The Contractor shall be responsible for obtaining all necessary permits, manifests, material shipping records and bill of lading documentation in conjunction with contaminated/hazardous material removal, hauling and disposition; and he shall

provide timely notification of such actions as may be required by applicable federal, state regional, and/or local authorities. RIDEM shall be notified within 24 hours if an unexpected change of conditions is encountered related to the presence of hazardous wastes or material encountered at the site.

The Contractor shall prepare slips to document the transportation of the soil from the Project to the final disposal site. The slips shall, as a minimum, list the following information: date, truck identification, truck driver's name, approximate quantity of soil hauled, weight, disposal location, and the Engineer's representative's signature. These slips shall be prepared in duplicate. The Contractor shall retain one copy, and the second copy shall be given to the Engineer at the end of each day in which soil is hauled.

The Contractor shall also be responsible for preparing material shipping records and manifest documentation for all materials moved off Project. Material shipping records shall be provided to the Engineer at the end of each work day. Within 15 days of shipment of material, signed copies of the material shipping records and manifest documentation, including facility weight slips for each load, shall be provided to the Engineer.

**EQUIPMENT/MATERIALS;**

The Contractor shall supply and use all materials and equipment required to adequately provide and maintain excavation location security/access and complete unclassified, contaminated or hazardous soil excavation, handling, loading and disposal.

All unclassified, contaminated or hazardous soil, if stockpiled, shall be placed on and covered with polyethylene sheeting, as described in the RAWP, SMP, and Item Code 201.9901.

The Contractor shall have the necessary personal protective equipment available as specified in the Contractor's Project specific Health and Safety Plan and shall have access to an inventory of personal protection equipment in the event that the level of personal protection equipment needs to be upgraded. All materials to be used shall be in accordance with all appropriate sections of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition, and all revisions. During excavation, handling, loading, hauling and/or disposal, the Contractor shall minimize odors by methods including but not limited to the use of odor suppressant shell material, as necessary or as directed by the Engineer.

**UNCLASSIFIED AND CONTAMINATED SOIL EXCAVATION AND HANDLING:**

The Contractor may choose and implement any effective and lawful method for handling loading, hauling and/or disposal unclassified, contaminated or hazardous

soil encountered in the work area provided they perform the required excavation subject to the approval of the Engineer. The Contractor shall assume all responsibility for the adequacy of the methods, materials, documentation, and equipment employed.

During excavation of unclassified, contaminated or hazardous soil the Contractor shall be required to control access, dust and sedimentation erosion. Fencing and staked hay bales shall be installed around excavations to protect public, limit site access and minimize the effects of erosion and surface run-off and as shown on the Plans or as directed by the Engineer.

While engaged in unclassified, contamination or hazardous materials removal, the Contractor shall be subject to on-Project inspection by the Engineer. If the work is in violation of the requirements of these Special Provisions, RIDOT will issue a stop work order to be in effect immediately and until the violation is resolved. Standby time and expenses required to resolve the violation shall be at the Contractor's expense.

All excavated Type A, or 1B soils within the Right of Way proposed for reuse as common borrow shall undergo geotechnical, arsenic and lead testing at the point of excavation origin prior to placing in trucks. Soils meeting common borrow requirements shall be placed into trucks and hauled to an approved temporary stockpile location for reuse within the limits of the Project. All excavated soil Type A and 1B soils not meeting common borrow requirements shall be placed into trucks and, as applicable hauled to a Stockpile Area for further characterization (prior to off Project disposal) and covered with a 12-mil layer of polyethylene at the completion of each work day, as designated by Engineer.

All excavated Type A, or 1B soils not proposed for reuse and Type 2 or Type 3 soils shall immediately be placed into trucks and, as applicable hauled directly to an off Project recycling/disposal site, or hauled to Stockpile Area for further characterization (prior to off Project disposal), and covered with a 12-mil layer of polyethylene at the completion of each work day, as designated by Engineer.

All temporary stockpile locations shall be surrounded by fencing and staked baled hay erosion checks. Additional, temporary stockpile areas shall be selected by the Contractor and be subject to the approval of the Engineer. The covers, fencing and baled hay erosion checks shall be inspected daily and restored, as needed to control dust and erosion.

Contaminated soil shall be reused within Project limits, disposed at an off-Project recycling facility or disposal facility in accordance with RIDEM regulations for recycling/disposal of these materials. On Project confirmatory testing and characterization testing of Type 1B, 2, or 3 soils for disposal will be the responsibility of RIDOT and its consultant. Data will be provided to the Contractor

for disposal facility characterization. Disposal of material shall not be allowed at any facility that currently maintains a listing as a State or Federal waste site.

Imported soil testing and testing of excavated Type A or 1B soils for reuse of common borrow within the limits of the Project and testing of Type A soils for disposal at an off-Project receiving facility shall be the responsibility of the Contractor at no additional cost to the State. All handling and disposal of these materials shall conform to the applicable RIDEM requirements for handling, storage, transporting, and disposal of contaminated/hazardous waste material. The Contractor shall be responsible for submitting material testing data and any additional data obtained by the Contractor to the receiving facility, to the Engineer and to RIDEM prior to the removal and final disposal of contaminated material from Project limits or an interim stockpile area approved by the Engineer. Where specifications, requirements, and reference documents vary, the more stringent requirements shall apply.

Contaminated soil classifications under this Contract shall be as follows:

- Type A: Excess excavated Project soil that cannot be reused in which levels of arsenic, lead and other RCRA Eight Metals, TPH, VOCs and PAHs are found to be below RIDEM Method 1 Residential Direct Exposure Criteria (RDEC) through testing. This soil shall be tested by the Contractor prior to being disposed at an Industrial/Commercial site under Item Code 202.9902.
- Type 1B: Excavated or excess excavated Project soil that cannot be reused in which levels of arsenic, lead and other RCRA Eight Metals, TPH, VOCs and PAHs are found to be above RDEC but below I/C DEC through testing. This soil shall be loaded, hauled and disposed at a licensed facility under Item Codes 202.9903 and 202.9904. Concentrations are within disposal parameter limits allowed in state landfills as landfill cover.
- Type 2: Excavated Project soil in which levels of arsenic, lead and other RCRA Eight Metals, TPH, VOCs and PAHs are found to be above I/C DEC through testing but are within acceptable criteria parameters such that the material can be disposed of in out-of-state landfills for landfilling without pretreatment or the material is suitable for asphalt batching. This soil shall be loaded, hauled and disposed at a licensed facility under Item Codes 202.9905 and 202.9906.
- Type 3: Excavated Project soil in which contamination levels exceed EPA and/or RIDEM hazardous waste characteristics necessitating disposal as hazardous waste. Type 3 soils have not been encountered on the Project but a Bid Item has been inserted in the Proposal under Item Code

202.9907 as a Lump Sum amount from which payments will be drawn in the event that Type 3 soils are encountered.

**METHOD OF MEASUREMENT:**

Item 202.9902 "LOAD, HAUL AND DISPOSE SOIL, TYPE A" will be measured for payment by the "Cubic Yard" actually loaded, hauled and disposed in accordance with the Contract Documents and/or as directed by the Engineer.

Item 202.9903 "LOAD, AND HAUL CONTAMINATED SOIL, TYPE 1B" and Item 202.9904 "DISPOSAL OF CONTAMINATED SOIL, TYPE 1B" will be measured for payment by the "Ton" actually loaded and hauled or disposed in accordance with the Contract Documents and/or as directed by the Engineer. The number of tons will be determined from weight slips generated by the receiving disposal facility or other Contractor provided scale approved by the Engineer.

Item 202.9905 "LOAD, AND HAUL CONTAMINATED SOIL, TYPE 2" and Item 202.9906 "DISPOSAL OF CONTAMINATED SOIL, TYPE 2" will be measured for payment by the "Ton" actually loaded and hauled or disposed in accordance with the Contract Documents and/or as directed by the Engineer. The number of tons will be determined from weight slips generated by the receiving disposal facility or other Contractor provided scale approved by the Engineer.

Item 202.9907 "LOAD, HAUL AND DISPOSE CONTAMINATED SOIL, TYPE 3" will be measured for payment by the actual cost, verified by the force account records for the facility profiling, loading, transporting and disposing, and invoices from the disposal facility per soil type referenced herein.

**BASIS OF PAYMENT:**

The accepted quantity of item 202.9902 "LOAD, HAUL AND DISPOSE SOIL, TYPE A" will be paid for at its respective contract unit price per "Cubic Yard" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools, and equipment and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

The accepted quantity of item 202.9903 "LOAD, AND HAUL CONTAMINATED SOIL TYPE 1B" will be paid for at its respective contract unit price per "Ton" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools, and equipment and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

The accepted quantity of item 202.9904 "DISPOSAL OF CONTAMINATED SOIL, TYPE 1B" will be paid for at its respective contract unit price per "Ton" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools, and equipment and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer. The only acceptable bid price for item 202.9904 shall be \$15.00 (fifteen dollars) per ton. If the cost of disposing this material charged by the receiving facility is different (higher or lower) than \$15.00/Ton, then the price paid per ton for this item will be adjusted (higher or lower) by that difference in Dollars/Ton.

The accepted quantity of item 202.9905 "LOAD, AND HAUL CONTAMINATED SOIL TYPE 2" will be paid for at its respective contract unit price per "Ton" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools, and equipment and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

The accepted quantity of item 202.9906 "DISPOSAL CONTAMINATED SOIL, TYPE 2" will be paid for at its respective contract unit price per "Ton" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools, and equipment and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer. The only acceptable bid price for item 202.9906 shall be \$75.00 (seventy five dollars) per ton. If the cost of disposing this material charged by the disposal facility is different (higher or lower) than \$75.00/Ton, then the price paid per ton for this item will be adjusted (higher or lower) by that difference in Dollars/Ton.

The accepted quantity of item 202.9907 "LOAD, HAUL AND DISPOSE CONTAMINATED SOIL, TYPE 3" will be paid for at the actual amount expended to handle, load, transport and dispose of the type of soil. The price so stated shall constitute full and complete compensation for all labor, materials, tools, and equipment and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer. The estimated dollar figure for this item of work is established by the Department at \$ 20,000.00 and is inserted in the proposal as an authorized Lump Sum amount from which payments will be drawn.

**Appendix F**  
Operating Log

**Remedial Action Work Plan**

*Natick Bridge No. 383, Warwick/West Warwick, RI*

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<b>Date</b>	<b>Work Period</b>	<b>Amount of Soil Excavated</b>	<b>Field Screening Technique/Results</b>	<b>Final Disposition of Soil</b>	<b>Number of Samples Collected</b>	<b>Laboratory Analysis Performed</b>

**Appendix G**

March 25, 2011 Public Notice



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation  
ENGINEERING DIVISION

Two Capitol Hill, Rm. 226  
Providence, RI 02903-1124  
PHONE 401-222-2023  
FAX 401-222-3006; TDD 401-222-4971

March 25, 2011

Occupant  
754 East Avenue  
Warwick, RI 02886

RE: RIDEM CASE # 2011-007  
REPLACEMENT OF NATICK BRIDGE NO. 383  
WARWICK & WEST WARWICK, RHODE ISLAND

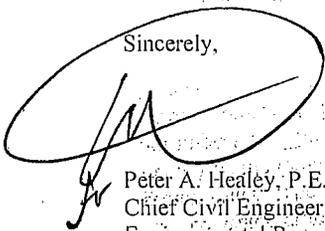
Dear Occupant,

As the owner/occupant of property located at Assessor's Plat 262, Lot 121, in Warwick, Rhode Island, and in accordance with the Rhode Island Department of Environmental Management's (RIDEM's) Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (the Remediation Regulations), and the Industrial Property Remediation and Reuse Act (Rhode Island General Law 23-19.14, Section 11), The Rhode Island Department of Transportation (RIDOT) is providing notice to abutters regarding an environmental investigation which has been conducted for the planned Replacement of Natick Bridge No. 383 in Warwick and West Warwick, Rhode Island (Project). The areas in which the testing was performed consist of property located along the Project's new bridge alignment. The goal of the investigation was to determine the extent to which any historical activities at these properties may have resulted in any exceedences of RIDEM's promulgated soil and surface water criteria and groundwater objectives. The investigation involved sampling and analysis of surface and subsurface soil and groundwater. The results of the investigation indicate that some of the soil on properties within the limits of the Project contained Metals and Semi-Volatile Organic Compounds (SVOCs) at levels above the Residential Direct Exposure Criteria. Groundwater within the project limits is not impacted. The preferred remedial alternative for the contaminated property is to remove all impacted soil to comply with the Residential Direct Exposure Criteria and establish Environmental Land Use Restrictions, if necessary. The future use of property within the limits of the Project will be for commercial public transportation purposes. RIDEM has determined that the investigation has adequately assessed the nature and extent of the contamination at the property and addressed all concerns in accordance with the Remediation Regulations.

There is a 14-day comment period, commencing with the date of delivery of this notice, during which the public may review RIDEM records pertaining to this property and submit written comments regarding the technical feasibility of the preferred remedial alternative. Should you require additional time for review, a request for an extension of the comment period may be made to the Department. Requests must be received by the Department before 4:30pm on the final day of the comment period, and may be made in writing to the address below or by calling the telephone number listed below. RIDEM will consider all substantive written comments prior to issuing its final approval of the proposed remedial alternative. Arrangements to review RIDEM records may be made by calling 222-2797, ext. 7105. Written comments should be submitted to:

Margaret Dein Bradley  
R.I. Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, RI 02908-5767

Sincerely,



Peter A. Healey, P.E.  
Chief Civil Engineer  
Environmental Resources & Highway Engineering

cc: Fish, File