



**Remedial Action Work Plan
Lincoln Lace & Braid Remediation Project
55-61 Ponagansett Street
Providence, Rhode Island**

Prepared for

Providence Parks Department
Dalrymple Boathouse – Roger Williams Park
Providence, Rhode Island 02905

Prepared by

EA Engineering, Science, and Technology
2350 Post Road
Warwick, Rhode Island 02886
(401) 736-3440

August 2010
Revision 2
EA Project No.: 61891.05

CONTENTS

LIST OF FIGURES

	<u>Page</u>
1. INTRODUCTION	1
1.1 Site Description	1
1.2 Historical Context.....	2
1.3 Previous Investigations/Remedial Actions.....	2
1.4 Current Goals/ Objectives	4
2. REMEDIAL OBJECTIVES	5
2.1 Soil.....	5
2.2 Surface Water and Sediment Objectives	6
2.3 Groundwater	7
3. PROPOSED REMEDY	8
3.1 Engineered Cap	8
3.1.1 Closure Cap Subgrade.....	9
3.1.2 Geotextile Filter Layer.....	9
3.1.3 Protective Cover Soil Layer/Vegetative Cover.....	9
3.1.4 Riparian Buffer Restoration	10
3.1.5 Sluiceway/Wetland Restoration.....	10
3.2 Environmental Land Usage Restriction	11
4. POINTS OF COMPLIANCE	12
4.1 Soil.....	12
4.2 Sediment.....	12
4.3 Surface Water	12
4.4 Groundwater	12
5. PROPOSED SCHEDULE FOR REMEDIATION.....	13
6. CONTRACTORS AND CONSULTANTS.....	14
7. DESIGN STANDARDS AND TECHNICAL SPECIFICATIONS.....	15
8. SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN	16

	<u>Page</u>
9. SECURITY PROCEDURES	17
10. INSTITUTIONAL CONTROLS	18
11. COMPLIANCE DETERMINATION	19
12. CERTIFICATIONS	20
 APPENDIX A: SPECIFICATIONS	
 APPENDIX B: BID PLANS	
 APPENDIX C: ENVIRONMENTAL LAND USAGE RESTRICTION AND SOIL MANAGEMENT PLAN	
 APPENDIX D: SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN	
 APPENDIX E: FLOODPLAIN CALCULATIONS	
 APPENDIX F: RESPONSE TO RIDEM COMMENTS	

LIST OF FIGURES

<u>Number</u>	<u>Title</u>
1	Locus Map
2	Historical Sampling Plan

1. INTRODUCTION

On behalf of the City of Providence, EA Engineering, Science, and Technology, Inc. (EA) has prepared this Revised Remedial Action Work Plan (RAWP) for the Lincoln Lace & Braid Remediation Project in Providence, Rhode Island (the Site). This Site is located to the north of Barbara Street and the south of RI Route 6. This Revised RAWP supersedes the previously submitted RAWP and has been prepared to satisfy Section 9.0 of the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* (short title: *Remediation Regulations*), August 1996, as amended February 2004.

The remediation of the site represents an important step in the further development of Providence's Woonasquatucket River Greenway and bike trail project. Completion of the Greenway project will help restore the Woonasquatucket River to its former grandeur and revitalize the neighborhoods of Olneyville, Hartford, and Manton. The project's main goals are to increase the recreational and green space available to local residents, promote river conservation and environmental action, stimulate economic development, and increase awareness of local history and river ecology.

1.1 SITE DESCRIPTION

The former Lincoln Lace & Braid complex is located at 55-61 Ponagansett Street in Providence, Rhode Island. The Site is located on approximately 6.0 acres of land adjacent to the Woonasquatucket River in the Hartford section of Providence, designated on the City of Providence Tax Assessor's Map as Plat 113, Lots 305 and 429. Figure 1 provides a Site Location Map.

The lot slopes down from south to north, towards the Woonasquatucket River. Access from Ponagansett Avenue to the west is via a steep asphalt driveway (ca. 1950) that begins at the east end of the street, traverses the embankment on a south-north trajectory, and then swings sharply to the east across the now-filled headrace to reach the former building locations.

The embankment has been graded into three distinct terraces, with retaining walls constructed of random and split stone and concrete masonry that step and slope down from south to north. A stepped, coursed, split masonry and concrete wall lines the east wall of the tailrace immediately south of the location of the former Wheel House. The remainder of the tailrace has earthen embankments that suggest its original appearance as a flood channel. No traces of other mill buildings remain except for rubble piles and large split rectangular blocks scattered across the lot.

The Woonasquatucket River's north-south trajectory defines the eastern edge of the mill site and holds the remains of the 1918 dam in its channel near the north end of the lot. Concrete and rubblestone masonry dam abutments are located on both riverbanks and retain cast imprints and

wood fragments of the spillway's timber cribbing. Remains of both a late nineteenth-century and an early twentieth-century railroad bridge are located in the river channel approximately 240 ft downstream of the dam remains.

The former Ponagansett Avenue Landfill abuts the west end of the Site and is accessed by the same driveway as the subject site. This facility has been remediated in preparation for its potential conversion to a public park (DEM Case No. 2001-024).

1.2 HISTORICAL CONTEXT

The Lincoln Lace & Braid site was established in 1812 as Merino Mill. By 1870, there were mill villages on the Johnston and North Providence sides of the river at Olneyville, Dyerville, Manton Village, Lyman's Mill, Allendale, Centerdale, and Graniteville. Within Providence, mills included Union Cotton, Delaine, Lyman Manufacturing, and the Valley Bleachery. By that time, nearly every foot of the river's drop was being used to turn a factory waterwheel. The local manufacturers formed a company to build reservoirs upstream to store water for use during the dry months, such as the reservoir formerly located on the abutting site, the Ponagansett Avenue Landfill and to keep the mill wheels turning throughout the year. This was the first such water management system of its kind and was replicated on industrial rivers throughout the world (Beers 1870; Greenwood n.d.; RIHPHC 1976b, 1981, 1986).

In 1994, the main building of the mill complex was destroyed by fire. Subsequent remediation efforts have removed the building debris as well as petroleum and petroleum-contaminated soil from the Site. Only portions of the ruins of the former Merino Mill and its associated waterpower infrastructure are currently visible.

1.3 PREVIOUS INVESTIGATIONS/ REMEDIAL ACTIONS

The Site has been the subject of several investigations and cleanup actions. Documentation related to these activities has been reviewed and summarized in this RAWP. The following information sources were used:

- *Short-Term Response Report, Lincoln Lace & Braid Complex* (Cyn Environmental, February 1999)
- *Remedial Evaluation Report, Lincoln Lace & Braid, Providence, Rhode Island* (Rhode Island Department of Environmental Management – Office of Waste Management, December 1999)
- *Pre-Design Investigation Report*, dated August 2000, prepared by RIDEM's Office of Waste Management
- *Remedial Action Work Plan – Former Lincoln, Lace and Braid Site, Providence, Rhode Island* (MACTEC, Inc., November 2002 [Revised September 2003])

- *Remedial Action Work Plan for Ponagansett Avenue Remediation, 67 Melissa Street, Providence, Rhode Island* (EA Engineering, Science, and Technology, Inc. (July 2005)
- *Technical Memorandum, Lincoln, Lace, and Braid Property, Providence, Rhode Island – Cultural Resources Reconnaissance* (Public Archeological Laboratory, 16 April 2007)
- Correspondence entitled *Remedial Alternatives Analysis*, received by RIDEM on 11 May 2009, prepared and submitted by EA Engineering, Science, and Technology, Inc. (EA);
- Correspondence entitled *Revised Remedial Alternatives Analysis*, received by RIDEM on 8 July 2009, prepared and submitted by EA
- *Historical Site Characterization Site Plan*, received by RIDEM on 23 July 2009, prepared and submitted by EA
- *Lincoln Lace and Braid Supplemental Sampling and Analysis Plan*, received by RIDEM on 30 July 2009, prepared and submitted by EA
- *Sampling and Analysis Plan and Site-Specific Quality Assurance Project Plan for Supplemental Sediment and Surface Water Sampling*, received by RIDEM on 21 August 2009, prepared and submitted by EA
- *Sluiceway Sampling and Analysis Plan*, received by RIDEM on 25 August 2009, prepared and submitted by EA
- *Supplemental Sampling Analytical Results*, received by RIDEM on 1 December 2009, prepared and submitted by EA
- *Revised Remedial Alternative No. 3*, received by RIDEM on 1 December 2009, prepared and submitted by EA
- Correspondence entitled *Lincoln Lace and Braid Response to Comments*, received by RIDEM on 1 February 2010, prepared and submitted electronically by EA.
- *Depositional Sediment Dioxin Investigation*, received by RIDEM on 19 May 2010, prepared and submitted electronically by EA.

Previous investigations included test pit soil and groundwater sampling (Cyn Environmental, October 1996) and further removal actions conducted in November 1998. The 1996 removal action and test pit soil and groundwater sampling included the excavation and disposal of soil and petroleum from an underground storage tank (UST). Soil and groundwater samples were

collected from a total of 21 test pits resulting in the subsequent (1998) removal of contaminated soil in areas identified during the 1996 investigation.

In May 1996, a RIDEM contractor collected six sediment samples within the sluiceway to determine if sediments were impacted. Analytical results indicate the sediments are impacted with lead and arsenic and concentrations exceeding the RIDEM Residential and/or Industrial Commercial Direct Exposure Criteria for soil (no sediment standards are currently promulgated by RIDEM).

In August 2000, Fuss & O'Neill completed a limited design investigation (LDI) that concluded that anoxic conditions occur in the groundwater at the Site. The LDI stated that this condition allows iron to be released into a groundwater solution. When groundwater is exposed to oxygen (*i.e.*, in the tailrace), the iron precipitates out of solution and deposits on the bed of the former tailrace.

In October 2009, EA collected 8 sediment samples from the sluiceway to determine if previous remediation attempts were successful in the lower reaches of the sluiceway. Analytical results indicate sediments on the downstream reaches of the sluiceway are not impacted with arsenic and lead at concentrations exceeding the RIDEM Residential Direct Exposure Criteria. These exposure points have been considered and compensated for in the revision of this RAWP.

In response to a public request for investigation of potential impacts of depositional sediments resultant from March 2010 flooding, EA collected three composite samples from three locations at the Site. The analytical results indicate that 2,3,7,8-TCDD is present in depositional sediment and/or native soils at the Site. Concentrations range from 43 nanograms per kilogram (ng/kg (parts per trillion)) to 120 ng/kg. The cleanup standard established for the Centerville Manor Site in North Providence is equal to 1,000 ng/kg in sediment. RIDEM has established a 4.3 ng/kg residential direct exposure standard for other projects currently ongoing in the Providence area. EPA currently recommends a 50 ng/kg Screening Level and a 1,000 ng/kg Action Level for residential sites.

1.4 CURRENT GOALS /OBJECTIVES

The primary contaminants of concern at the Site are the presence of elevated metal and polycyclic aromatic hydrocarbon (PAH) concentrations previously observed in soil and sediment samples throughout the Site above the RIDEM RDEC. Exceedances of the RDEC for arsenic, beryllium, lead, mercury, ethyl benzene, trichloroethene, tetrachloroethene, xylene, and total petroleum hydrocarbons (TPH) were found in some soil samples.

This RAWP includes details on the remedial objectives and proposed remedy for the former Lincoln Lace & Braid Site. The implementation and completion of the remedial actions proposed in this RAWP will bring the Site into compliance with the RIDEM *Remediation Regulations*, as well as improve the aesthetic value of existing wetlands to provide valuable green space to the area.

2. REMEDIAL OBJECTIVES

This section summarizes the remedial objectives for each of the media of concern at the Site. Remedial technologies have been selected to address the following issues:

Media	Contaminant	Risk/Issue	Remedial Technology
Soil	Debris and Litter	None/Aesthetics	Removal/Offsite Disposal
	PAHs, TPH, Metals, VOCs	Direct Exposure	Engineered Soil Barrier/Environmental Land Usage Restriction
Sediment	Iron oxide/Metals	Direct Exposure/Aesthetics	Engineered Barrier/Wetland Plantings, ELUR
Surface Water (Tailrace)	Iron oxide	None/Aesthetics	Installation of Check Dams/Wetland Plantings
Groundwater	None	None	None

Additional detail regarding the media, contaminants, and remedial technologies are provided in the following sections.

2.1 SOIL

The following table summarizes the analytical results of soil samples collected at the Site that contained contaminants at concentrations exceeding the RIDEM RDEC. This data is representative of both surficial and test pit soil samples collected at various locations on the Site. Only those constituents with concentrations above the RDEC are provided.

TABLE 2.1 – SUMMARY OF SOIL ANALYTICAL ANALYSIS

Contaminant	Concentration (mg/kg)	RDEC (mg/kg)
Arsenic	ND -24.8	7.0
Beryllium	.105 - .901	0.4
Lead	119 - 980	150
Mercury	29	23
TPH	4 - >4000	500
Ethylbenzene	<10 - 73	71
Trichloroethene	<10 - 19	13
Tetrachloroethene	<10 - 34	12
Xylenes	<10 - 142	110

The long-term remedial objective for soil is to prevent direct exposure to fill material containing contaminant levels above the RIDEM RDEC. The construction of an engineered cap will

achieve this objective. The Soil Management Plan (SMP), provided in Appendix C, details the protocol to be followed during all future activities on the Site, including construction and future site development. The SMP will be incorporated into the Environmental Land Usage Restriction (ELUR) for the Site following completion of the remediation activities.

The short-term remedial objective for soil is to minimize direct contact with the subsurface fill materials during remedial and construction activities. The Safety, Health, and Emergency Response Plan (SHERP), provided in Appendix D, describes minimum personal protection standards and mandatory safety practices, procedures, and contingencies to be followed while performing field activities at the Site. Additionally, short-term erosion and dust control measures will be implemented during construction to prevent soil from entering surface waters, drainage swales, and adjoining properties and from becoming airborne.

2.2 SURFACE WATER AND SEDIMENT OBJECTIVES

The following table summarizes the results of previous sediment sampling at the Site. This data represents one sediment sample taken from the tailrace by the United States Environmental Protection Agency (EPA) in 1996, six sediment samples collected by a RIDEM subcontractor in 1996, and eight sediment samples collected by EA in 2009. RIDEM has no sediment quality criteria; therefore, RDEC for soil were used for comparison. Only those constituents with concentrations above the RDEC are provided.

TABLE 2.2 – SUMMARY OF SEDIMENT ANALYTICAL ANALYSIS

Contaminant	Concentration (mg/kg)	RDEC (mg/kg)
Arsenic	<1.69 – 24.6	7.0
Manganese	1,590	390
Lead	265	150
TPH	<45.6 – 1,120	500

In the short-term, stringent erosion, sediment, and dust control measures will be implemented during construction to prevent silt from entering surface waters, drainage swales, and adjoining properties and to limit negative impacts to the wetland to extent practicable.

Long term remedial objectives for sediment within the sluiceway include installation of an engineered barrier within areas demonstrated as contaminated and construction of a series of check dams to retard iron flocculent from entering the Woonasquatucket River. Additional objectives include the planting of native wetland species within the sluiceway buffer area to further prevent access to the impacted sediment. An 18-ft buffer along the northern edge of the tailrace will be established to allow plants to thrive and minimize potential impacts from the site-wide cap construction.

Surface water at within the sluiceway has been demonstrated to not be adversely impacting the Woonasquatucket River, according to sampling and analysis conducted by EA in October 2009. Therefore, there are no long term remedial objectives for surface water at the Site. However, iron flocculent is prevalent within the sluiceway, therefore, the City is proposing to install a series of check dams to retard the migration of iron flocculent into the Woonasquatucket River. However, this is strictly an aesthetic issue and therefore will not be associated with any points of compliance.

All remedial activities at the Site will be conducted in accordance with the Stormwater Pollution Prevention Plan (SWPPP) and RIPDES General Remediation Permit that will be submitted to the RIDEM Office of Water Resources under separate cover. Upon completion of remedial activities and redevelopment of the Site, stormwater will be managed in accordance with all applicable local, state, and federal regulations.

2.3 GROUNDWATER

Groundwater at the Site is classified as GB by RIDEM. Groundwater at the Site has been found to be in compliance with the RIDEM GB Groundwater Objectives through the sampling of the on-site monitoring wells during previous investigation activities. Therefore, there are no long term remedial objectives for groundwater at the Site. As no constituents were detected in exceedance of the applicable GB Groundwater Objectives, the analytical results are not tabulated within this report. Please refer to Figure 2, Historical Sampling Plan for groundwater sampling analytical results.

Groundwater is not expected to be encountered during remedial activities; therefore, no short-term remedial objectives for groundwater are proposed. All groundwater monitoring wells that are located on the Site will be abandoned during remedial activities in accordance with RIDEM regulations.

3. PROPOSED REMEDY

The existing condition that needs to be addressed at this Site is the soil contamination consisting of petroleum hydrocarbons, several volatile organic compounds, beryllium, arsenic, lead, and mercury. The engineered cap will eliminate exposure to site users and adequately fulfill the long-term remedial objectives. Site users will have no contact with impacted soil following construction of the engineered cap. All intrusive remedial activities covered under this RAWP will be conducted in accordance with the SMP (Appendix C), SHERP (Appendix D), and SWPPP. All remedial activities will be conducted in accordance with all applicable local, state, and federal rules and regulations.

3.1 ENGINEERED CAP

There are seven types of engineered cap proposed for this property due to the presence of the 100-year floodplain and proposed bike path on the Site. However, one of these engineered caps is relative to the impacted sediments within the sluiceway. These are identified as Cover Systems 1 through 5 on the attached Proposed Capping Plan (Sheet 3 of Appendix B).

Cover System 1 refers to an engineered cap consisting of 1 ft of certified clean soil underlain with a geotextile. This cover system is located mainly within the 100-year floodplain. As this cover system is located within the 100-year floodplain, the area will be cut 16 in. prior to installation of the geotextile and one ft soil cap to maintain flood storage across the Site. The additional 4 in. of excavation are to compensate for filling within the floodplain in other areas (cover systems 3 and 5). The floodplain compensation calculations are included in Appendix E.

This cover system will be installed in all areas within the 100-year floodplain that do not contain mature, established trees. This cover system will also be implemented in all areas of proposed plantings. The plantings will be installed after installation of the engineered cap, over the geotextile filter fabric. The delineation of this cover system is shown on Sheet 3 of Appendix B.

Cover System 2 refers to an engineered cap also consisting of one ft of certified clean soil underlain with a geotextile. However, this cover system will be constructed in western upland portions of the Site outside of the 100-year floodplain. In this area, there are no restrictions on the final elevation of the cap. Therefore, the material excavated from the areas within the 100-year floodplain will be installed in this area prior to installation of the engineered cap. Refer to Sheet 3 of Appendix B for the delineation of this cover system.

Cover system 3 also refers to an engineered cap consisting of 1 ft of certified clean soil underlain with a geotextile. This cover system is located outside of the 100-year floodplain and therefore will not be excavated prior to installation of the engineered cap. Filling will not be conducted in this area prior to installation of the engineered cap. Three mature established trees will remain in the area of this cover system. The engineered cap will extend directly to the tree trunks. The trees will be monitored on a quarterly basis by the City of Providence Parks Department to

determine if the trees need to be removed. If the trees need to be removed, the engineered cap will be repaired in this area to prevent exposure to impacted native soils.

Cover system 4 refers to an engineered cap consisting of 1 ft of certified clean soil underlain with a geotextile. However, this cap will be installed in the areas of the future bike path. This area will be filled with 1 ft of gravel in accordance with RIDOT specifications to proposed grade to provide RIDOT with a base for the proposed bike path and avoid significant disturbance to the engineered cap. This area will be covered with erosion control matting until construction of the bike path.

Cover system 5 refers to an engineered cap consisting of a geogrid, geotextile, and 6 in of 1.5 in minus crushed stone. This cap will be installed in all areas of the sluiceway demonstrated as contaminated during the EA investigation conducted in October 2009. The geogrid will be installed to provide stability to the cap, as geotechnical data within the sluiceway is not available. The geotextile and crushed stone will be installed to isolate contaminated sediments from downstream migration and prevent direct exposure.

Cover system 6 refers to an engineered cap consisting of 6 in on a construction fencing barrier layer. This cap will be installed in river bank area within the existing vegetation. The vegetation shall remain to help stabilize this area, while preventing direct exposure.

Cover system 7 refers to an engineered cap consisting of 6 in of 1.5 in minus crushed stone on top of a construction fencing barrier layer. This cap will be installed around trees with a diameter of 12 in or greater unless showing visual signs of disease and/or infestation. The cap will encompass a 30' diameter around each tree or under its canopy, whichever is smaller. This will preserve the trees while preventing direct exposure.

3.1.1 Closure Cap Subgrade

A closure cap subgrade will be prepared from the existing site grade that will create adequate stormwater drainage for the Site and serve as a suitable base for the components of the closure cap system following clearing/grubbing and off-site disposal of existing debris. The existing concrete and asphalt surfaces will be broken in place, crushed to specified size and placed in the areas of Cover System 2 prior to installation of the engineered cap.

3.1.2 Geotextile Filter Layer

A geotextile filter layer will be placed above the closure cap subgrade and below a protective soil cover to prevent human exposure to impacted soil at the Site while allowing precipitation to infiltrate through the cover systems and into the groundwater table. The fabric filter will be installed so that the seams overlap to prevent the underlying impacted soil from mixing with the clean soil cap.

3.1.3 Protective Cover Soil Layer/Vegetative Cover

The protective cover soil layer of the closure cap system, also commonly termed the vegetative support soil layer, will consist of a minimum of 4 in to 6 in. of certified clean fill material. The vegetative support soil layer is designed to provide for root growth while buffering the underlying layers from damage due to the effects of frost penetration, root penetration, and loading of the finished surface of the closure cap. The upper 4 in. of this soil layer will be specified as a topsoil/loam having characteristics to promote adequate vegetation, stability, and erosion resistance.

All imported fill material will meet the RDEC and GB Leachability Criteria and will be sampled for arsenic at a frequency of one sample per 500 tons. One-quarter of the total number of compliance samples of clean fill will be sampled for VOCs, Total Priority Pollutant (PP13) Metals, PAHs and TPH. Laboratory results will be provided to RIDEM in the Remedial Action Closure Report.

3.1.4 Riparian Buffer Restoration

A buffer between the Woonasquatucket River and the future bike path will be created to increase the ecological value of the Site while prevent direct exposure. This riparian restoration opportunity involves installation of 3 engineered cap systems, a fence (not part of this project, to be built with the bike path as part of RIDOT's plans), and the planting of shrubs to enhance microhabitat diversity and functionality of the floodplain. See the Proposed Conditions Plan as part of this RAWP for more detail.

This restoration area is located adjacent to the Woonasquatucket River and will enhance and encourage the wildlife habitat that currently frequents the surrounding area. This area is defined as the area between the Woonasquatucket River and the proposed bike path and is referred to as Upland Buffer Type 2.

3.1.5 Sluiceway/Wetland Restoration

The southern extent of the former mill sluiceway defines the southeastern boundary of the project Site. The remediation strategy for this portion of the Site includes the installation of an engineered barrier, construction of several check dams within the sluiceway, and the establishment of a mixed scrub-shrub/wet meadow wetland community.

The plantings refer specifically to three planting zones, delineated on Sheet 7 of Appendix B, Planting Plan. The most upland zone, Upland Buffer Type 1, consists of shrubs with thorns and that will discourage access to the sluiceway. The riparian planting zone is located between the upland planting zone and the sluiceway and includes plantings that thrive in wetlands and provide ecological value to the area. Finally, cattails will be planted along the sluiceway to stabilize the bank and obstruct sight lines to the sluiceway.

A previous remediation attempt within the sluiceway excavated sediments within the downstream reaches of the sluiceway. Sampling and analysis of sediments conducted by EA in 2009 confirmed the effectiveness of the remediation by demonstrating that sediments were not contaminated in the downstream area. Therefore, an engineered barrier is not required in this area (Sheet 3 of Appendix B).

The proposed engineered barrier in the sluiceway (cover system 5) refers to an engineered cap consisting of a geogrid, geotextile, and 6 in of crushed stone. This cap will be installed within the impacted areas of the sluiceway. The geogrid will be installed to provide stability to the cap. The geotextile and crushed stone will be installed to isolate contaminated sediments from downstream migration and prevent direct exposure to impacted sediment.

Five check dams will be installed within the sluiceway for two purposes. The first purpose is to act as a barrier, creating backwater areas for the iron flocculation to settle out and minimize downstream migration. The second purpose of the check dams is to aerate the water. The physical action of the water flowing over the check dams will entrain oxygen in the water column. The oxygen cause the ferrous iron (Fe^{+2}) in dissolved phase to oxidize into ferric iron (Fe^{+3}) and precipitate into the rust colored iron flocculent currently present in the sluiceway. The following check dam would then capture the iron, minimizing further downstream migration into the Woonasquatucket River.

3.2 ENVIRONMENTAL LAND USAGE RESTRICTION

An ELUR documenting the required maintenance and quarterly and annual inspections of the engineered cap will be recorded in the land evidence records for the property following remedial action activities. This ELUR will include the SMP to provide protocol for future intrusive activities. A draft ELUR and SMP are provided in Appendix C.

4. POINTS OF COMPLIANCE

4.1 SOIL

The Site will be regularly inspected and logs of the remedial activities, including photographs and field notes, will be maintained to ensure that the remedial design specifications are adhered to during all construction activities. The impacted soil at the Site will be considered to be in compliance once it has been completely capped as proposed in this RAWP and the ELUR has been placed on the property following construction and final closure activities.

4.2 SEDIMENT

The Site will be regularly inspected and logs of the remedial activities, including photographs and field notes, will be maintained to ensure that the remedial design specifications are adhered to during all construction activities. The impacted sediment at the Site will be considered to be in compliance once it has been completely capped as proposed in this RAWP and the ELUR has been placed on the property following construction and final closure activities.

4.3 SURFACE WATER

No Points of Compliance are proposed for surface water. No long-term surface water objectives were proposed in Section 2.2; however, the Site will be regularly inspected and logs maintained during installation of the check dams within the sluiceway in order to limit the aesthetic impacts of the iron-impacted surface water entering the Woonasquatucket River.

4.4 GROUNDWATER

Groundwater has been determined to be compliant with the applicable RIDEM criteria. Therefore, no points of compliance are proposed.

5. PROPOSED SCHEDULE FOR REMEDIATION

A proposed schedule for the remediation project is provided below.

Project Task	Approximate Start Date	Approximate Completion Date
1. RAWP Submittal to RIDEM	May 2010	May 2010
2. RIDEM Review Period	May 2010	August 2010
3. Contractor Procurement	May 2010	June 2010
4. Contractor Selection	June 2010	June 2010
5. Pre-Construction Meeting	September 2010	September 2010
6. Construction Oversight	July 2010	October 2010
7. Closure Report	November 2010	December 2010

6. CONTRACTORS AND CONSULTANTS

The contractor for this project will be determined through an open bidding process. Upon award, a complete list of consultants and contractors will be provided to RIDEM.

7. DESIGN STANDARDS AND TECHNICAL SPECIFICATIONS

The design drawings and specifications for the project are provided on the attached bid plans and specifications, provided as 2 through 5 and in Appendix A.

8. SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN

The SHERP defines actions to be taken with respect to personal safety during work activities associated with the development project. Work activities will include material excavation and grading. One copy of the SHERP will be maintained on site for use during the scheduled construction activities and made available for site use/employee review. Persons who enter the Site are required to read and understand the SHERP and sign the SHERP Review Record. The SHERP addresses the following regulations and guidance documents:

- Occupational Safety and Health Administration (OSHA) Standards for General Industry, 29 CFR 1910
- OSHA Standards for Construction Industry, 29 CFR 1926
- National Institute of Occupational Safety and Health, OSHA, U.S. Environmental Protection Agency, and U.S. Coast Guard *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985.

A copy of the SHERP is provided in Appendix D.

9. SECURITY PROCEDURES

All grading areas will be securely fenced to prevent trespassers from coming into contact with the temporarily exposed fill material during construction activities. Additional security will be at the discretion of the contractor.

10. INSTITUTIONAL CONTROLS

An ELUR will be recorded in the land evidence records for the Site at Providence City Hall following implementation of this remedial action.

12. CERTIFICATIONS

The undersigned certify that this RAWP is a complete and accurate representation of the contaminated site and contains all known facts to the best of their knowledge.

Robert McMahon
Superintendent of Parks
Providence Parks Department

Date



9/11/10

Frank B. Postma, LSP, LEP, PG
Senior Project Manager
EA Engineering, Science, and Technology, Inc.

Date



9/11/10

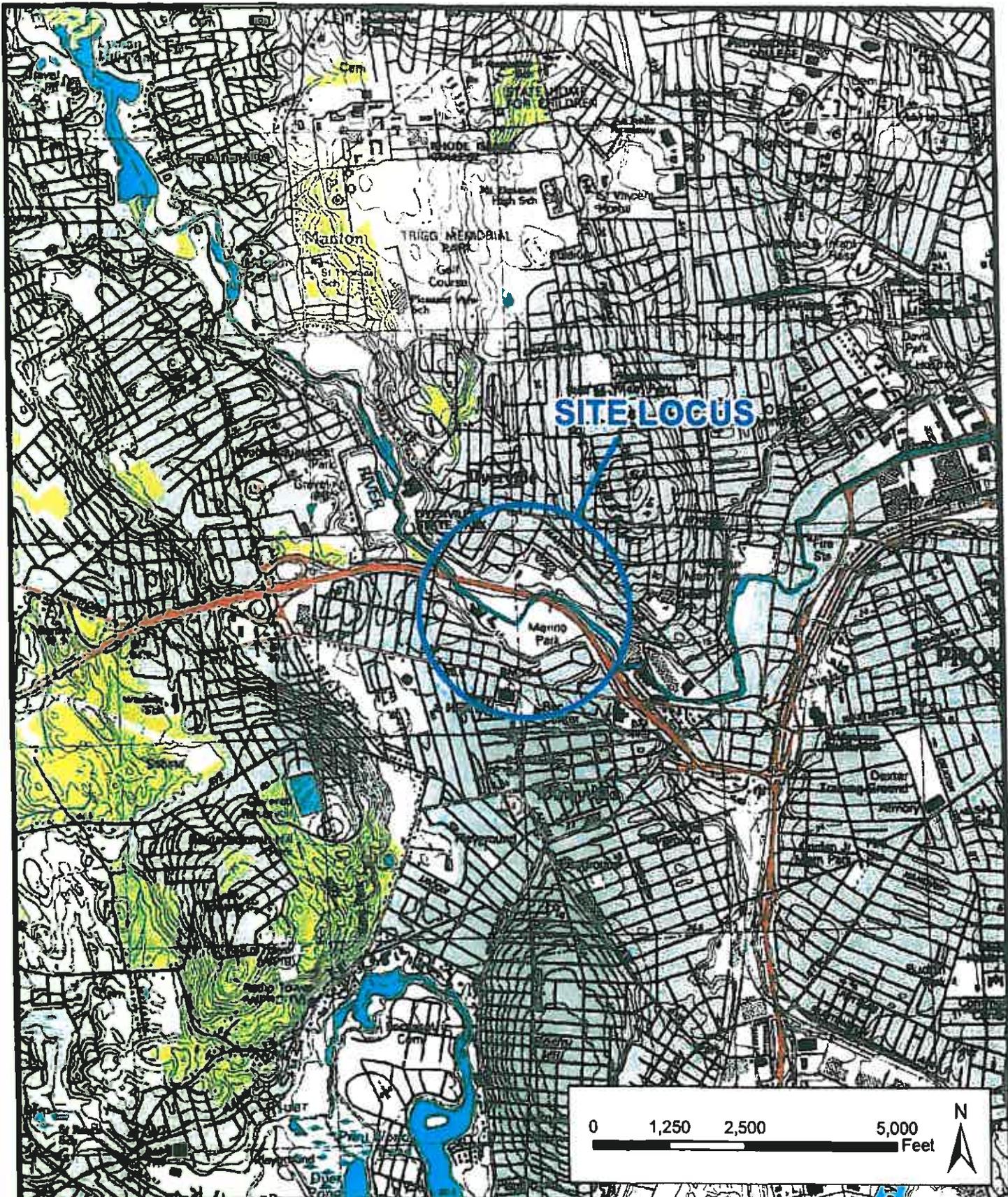
Stephen C. Mason, P.E.
Project Engineer
EA Engineering, Science, and Technology, Inc.

Date

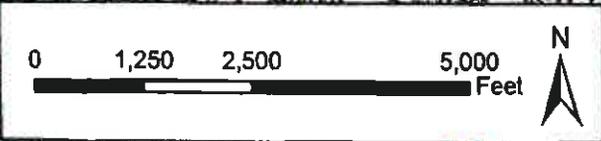
11. COMPLIANCE DETERMINATION

Compliance with the soil remedial objective will be demonstrated following the construction of the engineered cap and the recording of the ELUR in the City of Providence land evidence records.

Documentation of the cap, including inspection logs and photographs, will be provided to RIDEM in the Remedial Action Closure Report. A copy of the recorded ELUR will also be provided.



SITE LOCUS



		LINCOLN LACE & BRAID 55 PONAGANSETT STREET PROVIDENCE, RI				FIGURE 1 SITE LOCUS	
PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO.:	FILE NO.:
FBP	RM	PT	FBP	AS SHOWN	APRIL 2010	61891.05	LLB_LOCUS.MXD

Soil Vapor Sampling - 24 May 2000

Sample ID	Depth (ft)	TOC (ppm)	THC (ppm)	CHC (ppm)	CH4 (ppm)	CO2 (ppm)	CO (ppm)	H2S (ppm)	SO2 (ppm)	NO2 (ppm)	NO (ppm)	PM10 (ppm)	PM2.5 (ppm)
SV-01	0	0	0	0	0	0	0	0	0	0	0	0	0
SV-02	1	0	0	0	0	0	0	0	0	0	0	0	0
SV-03	2	0	0	0	0	0	0	0	0	0	0	0	0
SV-04	3	0	0	0	0	0	0	0	0	0	0	0	0
SV-05	4	0	0	0	0	0	0	0	0	0	0	0	0
SV-06	5	0	0	0	0	0	0	0	0	0	0	0	0
SV-07	6	0	0	0	0	0	0	0	0	0	0	0	0
SV-08	7	0	0	0	0	0	0	0	0	0	0	0	0
SV-09	8	0	0	0	0	0	0	0	0	0	0	0	0
SV-10	9	0	0	0	0	0	0	0	0	0	0	0	0
SV-11	10	0	0	0	0	0	0	0	0	0	0	0	0
SV-12	11	0	0	0	0	0	0	0	0	0	0	0	0
SV-13	12	0	0	0	0	0	0	0	0	0	0	0	0
SV-14	13	0	0	0	0	0	0	0	0	0	0	0	0
SV-15	14	0	0	0	0	0	0	0	0	0	0	0	0
SV-16	15	0	0	0	0	0	0	0	0	0	0	0	0
SV-17	16	0	0	0	0	0	0	0	0	0	0	0	0
SV-18	17	0	0	0	0	0	0	0	0	0	0	0	0
SV-19	18	0	0	0	0	0	0	0	0	0	0	0	0
SV-20	19	0	0	0	0	0	0	0	0	0	0	0	0
SV-21	20	0	0	0	0	0	0	0	0	0	0	0	0
SV-22	21	0	0	0	0	0	0	0	0	0	0	0	0
SV-23	22	0	0	0	0	0	0	0	0	0	0	0	0
SV-24	23	0	0	0	0	0	0	0	0	0	0	0	0
SV-25	24	0	0	0	0	0	0	0	0	0	0	0	0
SV-26	25	0	0	0	0	0	0	0	0	0	0	0	0
SV-27	26	0	0	0	0	0	0	0	0	0	0	0	0
SV-28	27	0	0	0	0	0	0	0	0	0	0	0	0
SV-29	28	0	0	0	0	0	0	0	0	0	0	0	0
SV-30	29	0	0	0	0	0	0	0	0	0	0	0	0
SV-31	30	0	0	0	0	0	0	0	0	0	0	0	0
SV-32	31	0	0	0	0	0	0	0	0	0	0	0	0
SV-33	32	0	0	0	0	0	0	0	0	0	0	0	0
SV-34	33	0	0	0	0	0	0	0	0	0	0	0	0
SV-35	34	0	0	0	0	0	0	0	0	0	0	0	0
SV-36	35	0	0	0	0	0	0	0	0	0	0	0	0
SV-37	36	0	0	0	0	0	0	0	0	0	0	0	0
SV-38	37	0	0	0	0	0	0	0	0	0	0	0	0
SV-39	38	0	0	0	0	0	0	0	0	0	0	0	0
SV-40	39	0	0	0	0	0	0	0	0	0	0	0	0
SV-41	40	0	0	0	0	0	0	0	0	0	0	0	0
SV-42	41	0	0	0	0	0	0	0	0	0	0	0	0
SV-43	42	0	0	0	0	0	0	0	0	0	0	0	0
SV-44	43	0	0	0	0	0	0	0	0	0	0	0	0
SV-45	44	0	0	0	0	0	0	0	0	0	0	0	0
SV-46	45	0	0	0	0	0	0	0	0	0	0	0	0
SV-47	46	0	0	0	0	0	0	0	0	0	0	0	0
SV-48	47	0	0	0	0	0	0	0	0	0	0	0	0
SV-49	48	0	0	0	0	0	0	0	0	0	0	0	0
SV-50	49	0	0	0	0	0	0	0	0	0	0	0	0
SV-51	50	0	0	0	0	0	0	0	0	0	0	0	0
SV-52	51	0	0	0	0	0	0	0	0	0	0	0	0
SV-53	52	0	0	0	0	0	0	0	0	0	0	0	0
SV-54	53	0	0	0	0	0	0	0	0	0	0	0	0
SV-55	54	0	0	0	0	0	0	0	0	0	0	0	0
SV-56	55	0	0	0	0	0	0	0	0	0	0	0	0
SV-57	56	0	0	0	0	0	0	0	0	0	0	0	0
SV-58	57	0	0	0	0	0	0	0	0	0	0	0	0
SV-59	58	0	0	0	0	0	0	0	0	0	0	0	0
SV-60	59	0	0	0	0	0	0	0	0	0	0	0	0
SV-61	60	0	0	0	0	0	0	0	0	0	0	0	0
SV-62	61	0	0	0	0	0	0	0	0	0	0	0	0
SV-63	62	0	0	0	0	0	0	0	0	0	0	0	0
SV-64	63	0	0	0	0	0	0	0	0	0	0	0	0
SV-65	64	0	0	0	0	0	0	0	0	0	0	0	0
SV-66	65	0	0	0	0	0	0	0	0	0	0	0	0
SV-67	66	0	0	0	0	0	0	0	0	0	0	0	0
SV-68	67	0	0	0	0	0	0	0	0	0	0	0	0
SV-69	68	0	0	0	0	0	0	0	0	0	0	0	0
SV-70	69	0	0	0	0	0	0	0	0	0	0	0	0
SV-71	70	0	0	0	0	0	0	0	0	0	0	0	0
SV-72	71	0	0	0	0	0	0	0	0	0	0	0	0
SV-73	72	0	0	0	0	0	0	0	0	0	0	0	0
SV-74	73	0	0	0	0	0	0	0	0	0	0	0	0
SV-75	74	0	0	0	0	0	0	0	0	0	0	0	0
SV-76	75	0	0	0	0	0	0	0	0	0	0	0	0
SV-77	76	0	0	0	0	0	0	0	0	0	0	0	0
SV-78	77	0	0	0	0	0	0	0	0	0	0	0	0
SV-79	78	0	0	0	0	0	0	0	0	0	0	0	0
SV-80	79	0	0	0	0	0	0	0	0	0	0	0	0
SV-81	80	0	0	0	0	0	0	0	0	0	0	0	0
SV-82	81	0	0	0	0	0	0	0	0	0	0	0	0
SV-83	82	0	0	0	0	0	0	0	0	0	0	0	0
SV-84	83	0	0	0	0	0	0	0	0	0	0	0	0
SV-85	84	0	0	0	0	0	0	0	0	0	0	0	0
SV-86	85	0	0	0	0	0	0	0	0	0	0	0	0
SV-87	86	0	0	0	0	0	0	0	0	0	0	0	0
SV-88	87	0	0	0	0	0	0	0	0	0	0	0	0
SV-89	88	0	0	0	0	0	0	0	0	0	0	0	0
SV-90	89	0	0	0	0	0	0	0	0	0	0	0	0
SV-91	90	0	0	0	0	0	0	0	0	0	0	0	0
SV-92	91	0	0	0	0	0	0	0	0	0	0	0	0
SV-93	92	0	0	0	0	0	0	0	0	0	0	0	0
SV-94	93	0	0	0	0	0	0	0	0	0	0	0	0
SV-95	94	0	0	0	0	0	0	0	0	0	0	0	0
SV-96	95	0	0	0	0	0	0	0	0	0	0	0	0
SV-97	96	0	0	0	0	0	0	0	0	0	0	0	0
SV-98	97	0	0	0	0	0	0	0	0	0	0	0	0
SV-99	98	0	0	0	0	0	0	0	0	0	0	0	0
SV-100	99	0	0	0	0	0	0	0	0	0	0	0	0
SV-101	100	0	0	0	0	0	0	0	0	0	0	0	0

Soil Vapor Sampling - 16 February 2000

Sample ID	Depth (ft)	TOC (ppm)	THC (ppm)	CHC (ppm)	CH4 (ppm)	CO2 (ppm)	CO (ppm)	H2S (ppm)	SO2 (ppm)	NO2 (ppm)	NO (ppm)	PM10 (ppm)	PM2.5 (ppm)
SV-01	0	0	0	0	0	0	0	0	0	0	0	0	0
SV-02	1	0	0	0	0	0	0	0	0	0	0	0	0
SV-03	2	0	0	0	0	0	0	0	0	0	0	0	0
SV-04	3	0	0	0	0	0	0	0	0	0	0	0	0
SV-05	4	0	0	0	0	0	0	0	0	0	0	0	0
SV-06	5	0	0	0	0	0	0	0	0	0	0	0	0
SV-07	6	0	0	0	0	0	0	0	0	0	0	0	0
SV-08	7	0	0	0	0	0	0	0	0	0	0	0	0
SV-09	8	0	0	0	0	0	0	0	0	0	0	0	0
SV-10	9	0	0	0	0	0	0	0	0	0	0	0	0
SV-11	10	0	0	0	0	0	0	0	0	0	0	0	0
SV-12	11	0	0	0	0	0	0	0	0	0	0	0	0
SV-13	12	0	0	0	0	0	0	0	0	0	0	0	0
SV-14	13	0	0	0	0	0	0	0	0	0	0	0	0
SV-15	14	0	0	0	0	0	0	0	0	0	0	0	0
SV-16	15	0	0	0	0	0	0	0	0	0	0	0	0
SV-17	16	0	0	0	0	0	0	0	0	0	0	0	0
SV-18	17	0	0	0	0	0	0	0	0	0	0	0	0
SV-19	18	0	0	0	0	0	0	0	0	0	0	0	0
SV-20	19	0	0	0	0	0	0	0	0	0	0	0	0
SV-21	20	0	0	0	0	0	0	0	0	0	0	0	0
SV-22	21	0	0	0	0	0	0	0	0	0	0	0	0
SV-23	22	0	0	0	0	0	0	0	0	0	0	0	0
SV-24	23	0	0	0	0	0	0	0	0	0	0	0	0
SV-25	24	0	0	0	0	0	0	0	0	0	0	0	0
SV-26	25	0	0	0	0	0	0	0	0	0	0	0	0
SV-27	26	0	0	0	0	0	0	0	0	0	0	0	0
SV-28	27	0	0	0									

APPENDIX A

Specifications

CONSTRUCTION SPECIFICATIONS FOR
LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

May 2010

Prepared For:

CITY OF PROVIDENCE DEPARTMENT OF PUBLIC PARKS
DALRYMPLE BOATHOUSE, ROGER WILLIAMS PARK
PROVIDENCE, RI 02905

Prepared By:

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.
2350 POST ROAD
WARWICK, RI 02886

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 10 13 SUMMARY OF THE WORK..... 3

SECTION 01 20 00 MEASUREMENT AND PAYMENT..... 7

SECTION 01 26 63 CHANGE PROCEDURE..... 18

SECTION 01 32 13 CONSTRUCTION SCHEDULES..... 20

SECTION 01 33 00 SUBMITTALS..... 22

SECTION 01 35 26 SAFETY..... 24

SECTION 01 42 19 REFERENCE STANDARDS..... 28

SECTION 01 45 00 QUALITY CONTROL..... 29

SECTION 01 50 00 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS..... 32

SECTION 01 60 00 MATERIAL AND EQUIPMENT..... 37

SECTION 01 71 23 SURVEY REQUIREMENTS..... 39

SECTION 01 77 00 PROJECT CLOSEOUT..... 43

SECTION 01 78 00 WARRANTIES..... 45

DIVISION 02 - EXISTING CONDITIONS

SECTION 02 41 00 DEMOLITION..... 48

DIVISION 31 - EARTHWORK

SECTION 31 00 00 EARTH WORK..... 49

SECTION 31 05 13 SOIL FILL MATERIALS..... 61

SECTION 31 23 19 DEWATERING..... 61

SECTION 31 25 00 SOIL SURFACE EROSION CONTROL..... 63

SECTION 32 92 19 SEEDING..... 66

SECTION 32 93 43 PLANTINGS..... 68

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

SECTION 01 10 13
SUMMARY OF THE WORK
(02/10)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Contract Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

PART 2 - CONTRACT DRAWINGS

Contract Drawings are as follows:

LINCOLN LACE AND BRAID REMEDIATION PROJECT

<u>DRAWING No.</u>	<u>TITLE</u>
T-1	TITLE SHEET
C-1	EXISTING CONDITIONS
C-2	PROPOSED CONDITIONS
C-3	PROPOSED FILL AREA
C-4	PROPOSED SLUICeway
C-5	CONSTRUCTION MANAGEMENT PLAN
C-6	PROPOSED PLANTING PLAN

2.1 DESCRIPTION

The "Work" of this Contract is titled Lincoln Lace and Braid Remediation Project and is described in the Contract Documents, including the Contract Drawings and specifications, and shall be referred to for detailed requirements of the work involved.

The "Work" generally includes, but is not limited to, the following: the demolition, crushing, and removal of an existing concrete slab; site grading and construction of an engineered barrier cover system; installation of an engineered barrier in a portion of the sluiceway; the grading of soils within the sluiceway; installation of a stone check-dam system in downgradient portion of sluiceway; and site preparatory work for a proposed bike path to be installed by others.

The Work shall include in the base bid all necessary labor, work, and equipment for construction as indicated in the documents.

The "Engineer" referenced in the Contract Specifications shall refer to the Construction Inspector provided by the Providence Department of Public Parks. The Contractor will be required to complete the entire work ready for use within 120 days from the date of Notice to Proceed.

2.2 SCHEDULING THE WORK

The Contractor shall perform all work on the site Monday through Friday between the hours of 7:00 AM and 7:00 PM. The Contractor may perform work at times other than those listed above with permission of the Engineer. The

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Contractor shall notify the Engineer a minimum of 48 hours in advance prior to performing any work outside the times listed.

PART 3 - PRODUCTS

Not Used

PART 4 - EXECUTION

4.1 CONSTRUCTION OF THE LINCOLN LACE AND BRAID ENGINEERED CAP AND CHECK DAM SYSTEM

The Contractor shall provide all labor; supervision; equipment; tools; testing devices; materials and material handling; security and accountability; and each and every item of expense necessary for the supply, fabrication, erection, installation, and construction (regardless of weather conditions) of the engineered barrier cover system (engineered cap) and check dam system. The Contractor shall provide all required submittals. No extension of the schedule will be allowed due to weather conditions.

4.2 CONSTRUCTION INSPECTION

The Contractor's work shall be monitored periodically by the Engineer. The Engineer does not anticipate that a full-time inspector will be assigned to this work. The Engineer will inspect the work at various times throughout the course of construction. In addition to the random Engineer inspections, the Contractor shall observe construction "hold points" to permit the Engineer to inspect the work of certain key elements of construction. The scope of each hold point inspection shall be discussed with the Contractor prior to the request for inspection. Hold point inspections will permit the Engineer to inspect the work of certain key elements of construction, as follows:

- a. Construction of access road(s) and temporary storage areas
- b. Installation of Erosion and Sediment Control Structures
- c. Construction stakeout
- d. Installation of cofferdams, fractionalization tanks, and dewatering systems
- e. Sluiceway grading
- f. Installation of each proposed check dam
- g. Placement of geogrid, geotextile, and stream base stone in sluiceway
- h. Completion of excavation within the 100-year floodplain
- i. Grading of impacted native soil outside of the 100-year floodplain as subgrade material
- j. Installation of geotextile filter fabric

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

- k. Placement, grading, and compaction of 8-in. gravel layer (Certified Clean Fill)
- l. Placement and grading of Certified Clean Topsoil.
- m. Site restoration including landscaping, tree/vegetation placement, and coconut mat installation
- n. Final inspection (punch list development)
- o. Completion verification inspection.

The Contractor shall keep the Engineer informed concerning the work status and projected work schedule through regular communications. The Engineer shall be notified by the Contractor **in writing 2 to 3 calendar days** prior to reaching each hold point previously designated by the Contractor. The Contractor shall reconfirm the inspection date 24 hours (not including Saturdays, Sundays, and legal holidays) before the scheduled hold point. Rescheduling of a hold point and cancellation shall also be given in writing by the Contractor. The Contractor shall not cover any work related to the designated hold point until one of the following occurs:

- a. The Contractor is authorized in writing to proceed after inspection by the Engineer
- b. The hold point inspection is rescheduled by the Engineer to a later construction event
- c. The hold point inspection is waived in writing by the Engineer.

The Contractor shall submit a written request for Final Inspection (Exhibit 01 10 13 - A) 14 calendar days in advance of the planned completion date. After review of the Notice of Completion, the Engineer may reject the Notice for cause or schedule the Final Inspection. The Engineer will perform its Final Inspection on all phases of the work and develop a comprehensive punchlist, which will be provided to the Contractor.

The Completion Verification Inspection will be scheduled when the punchlist items discovered during the Final Inspection have been corrected. The Engineer may add new items to the punchlist at this inspection.

The Contractor is advised that the Engineer will not accept the work until the Engineer determines that substantial completion has been achieved. Therefore, to minimize its risk of assessment of Liquidated Damages, the Contractor should schedule its work to be substantially complete in time to allow Final Inspection, punchlist work, and Completion Verification Inspection to occur in advance of the Contract Completion Date.

Nothing in this Section shall be construed to limit the Engineer's or Owner's right to inspect the work at any time.

-- End of Section --

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

EXHIBIT 01 10 13 - A
FINAL INSPECTION

(On Contractor Letterhead)

NOTICE OF COMPLETION

Effective at ____ (time) ____ hours on ____ (date) ____ work described under Contract No. _____, Construction of the Lincoln Lace and Braid Remediation Project in Providence, Rhode Island will be substantially and usably complete with the following exceptions: (none) or (describe remaining work items). We request that the Final Inspection be arranged as soon as possible after the above date.

By: (Name of Contractor's Representative)
Title of Contractor's Representative)

SECTION 01 20 00
MEASUREMENT AND PAYMENT
(3/10)

PART 1 - GENERAL

1.1 SCOPE

The procedures applicable to the measurement of work accomplished and payment to the Contractor for both periodic progress payments and final payment are described in this section. This section specifies the method of measurement and payment for each bid item listed on the Base Bid Form. Items for work called for by the Contract Drawings and Specifications, but for which no bid item is described, shall be considered subsidiary to the cost of the related bid items. Cost for all work to be conducted under this Contract shall be included under one of the Bid Items listed in Paragraph 1.2, Bid Items.

1.2 BID ITEMS

The scope of work included in each item and measurement and payment shall be as follows:

Bid Item 1: Mobilization/Demobilization

Work under this item shall consist of the mobilization and demobilization of the Contractor's forces and equipment necessary to perform the work required under the Contract. This item shall include all bonds, permits, insurance, administration, transportation to and from the site, operating supplies, detailed construction layouts, and coordination necessary for the Contractor to provide and maintain a construction force at the project site complete and ready to perform all work required under the Contract.

This pay item is a Lump Sum. Payment of the Contract Lump Sum amount will be made as the work proceeds and will be prorated based on the percentage of work under this item that has been completed. This payment shall be full compensation for all material, equipment, labor, disposal, and incidentals required to complete the work.

Bid Item 2: Temporary Facilities and Controls

1. **Clearing and Grubbing.** Clearing and grubbing will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract Lump Sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.
2. **Project Signage.** Installation and maintenance of project signage will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract Lump Sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

3. **Temporary Construction Entrance and Access Roads.** Installation and maintenance of stabilized Construction Entrance and Access Roads will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract Lump Sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.
4. **Staging and Stockpile Areas.** Staging and stockpile areas will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.
5. **Erosion and Sediment Control.** Erosion and sediment control will be measured and paid for at the Contract Unit price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The installation, maintenance, repair, resetting, and final removal of all erosion and sediment control devices will not be measured, but the cost will be incidental to the Contract price to construct the device unless otherwise specified in the Contract Documents. Erosion and sediment control management will not be measured, but the cost will be incidental to erosion and sediment control items specified in the Contract Documents.
6. **Cofferdam and Dewatering.** Temporary cofferdam, including installation of plastic liner, sand bags, removable pumping station(s), fractionalization tanks, and elements required by the approved dewatering plan during the construction period will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract Lump Sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.

Bid Item 3: Survey Requirements

Survey requirements will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for furnishing, placing, and maintaining construction layout stakes; baseline stakeout and grade verification; installation of permanent benchmarks; flagging of clearing limits and wetlands; and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract Lump Sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.

Bid Item 4: Wetland Restoration

Wetland restoration will not be measured but will be paid for at the Contract Lump Sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract Lump Sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.

Bid Item 5: Engineered Cap Construction, Non-Sluiceway

1. **Analytical Requirements.** Analytical requirements will not be measured but will be paid for at the Contract Lump Sum Price. The payment will be full compensation for the required environmental analysis per Rhode Island Department of Environmental Management (RIDEM) Standards of any soil imported to the site, when not covered as a specific pay item in the Contract Documents and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Also included in this bid item is the analysis of excavated soils from the floodplain and for all material, labor, equipment, tools, and incidentals necessary to complete the work.
2. **Excavation.** Payment for excavation shall be measured and paid for at the Contract Unit Price calculated to the nearest cubic yard (CY) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for excavation of any material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

Quantities for payment of excavation will be computed by the Method of Average End Areas, from the cross-sections of the original ground combined with cross-sections of the completed work. Excavation will always be measured from original position. No liquids will be included in any measurement. No measurement will be made for any additional excavation required for the construction of items other than those specified on the Contract Documents.

If scattered rock or boulders of .5 yard or larger volume are removed, any resulting undercutting approved by the Engineer will be measured for payment. Slides or breakages not attributable to the Contractor's negligence as determined by the Engineer will be measured and included in the final quantities for excavation.

Replacement of material lost as a result of natural causes will be measured and paid for at the Contract Unit Price per CY for excavation.

3. **Grading of Excavated Contaminated Soil.** Payment for the grading of excavated contaminated soil (impacted native soil) shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the grading of any other material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

Quantities for payment of grading will be computed by the Method of Average End Areas, from the cross-sections of the original ground combined with cross-sections of the completed work. No liquids will be included in any measurement. No measurement will be made for any additional grading required for the construction of items other than those specified on the Contract Documents.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

4. **Geotextile Material/Installation.** Payment for the installation of the geotextile material designated to construct the engineered cap shall be measured and paid for at the Contract Unit Price calculated to the nearest square yard (SY) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional geotextile material used onsite for constructing the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
5. **Procure Imported Gravel.** Payment for the procurement of imported gravel shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for procurement and transportation of imported gravel to the site. Payment will not be made for gravel used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
6. **Haul, Spread, and Compact Imported Gravel.** Payment for the hauling, spreading, and compaction of engineered cap gravel shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, materials, spreading, mixing, rolling, compacting, grading, drying or adding water for desired compaction, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for gravel used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
7. **Procure Imported Topsoil.** Payment for the procurement of imported topsoil shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for procurement and transportation of imported topsoil to the site. Payment will not be made for topsoil used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
8. **Haul and Spread Imported Topsoil.** Payment for the hauling and spreading of engineered cap topsoil shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, materials, spreading, mixing, rolling, grading, drying or adding water for desired compaction, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for topsoil used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
9. **Hydroseed.** Furnishing and installing hydroseed will not be measured but will be paid for at the Contract Lump Sum Price. The payment shall be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Bid Item 6: Engineered Cap Construction, Sluiceway

1. **Grading.** Payment for the preparation of sluiceway subgrade (grading) shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the grading of any other material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
2. **Geogrid Material/Installation.** Payment for the installation of the geogrid material designated to construct the engineered cap within the sluiceway shall be measured and paid for at the Contract Unit Price calculated to the nearest SY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional geogrid material used onsite for the construction of the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
3. **Geotextile Material/Installation.** Payment for the installation of the geotextile material designated to construct the engineered cap within the sluiceway shall be measured and paid for at the Contract Unit Price calculated to the nearest SY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional geotextile material used onsite for the construction of the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
4. **Crushed Stone Cap Material/Installation.** Payment for the installation of crushed stone cap material shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, materials, spreading, mixing, rolling, compacting, grading, drying or adding water for desired compaction, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for crushed stone cap material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
5. **Coconut Blanket Erosion Control Matting/Installation.** Payment for the installation of the coconut blanket erosion control designated for the erosion control of the wetland planting areas shall be measured and paid for at the Contract Unit Price calculated to the nearest SY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional material used onsite for the construction of the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

Bid Item 7: Check Dam Installation

1. **Furnish and Place Stone Weirs.** Payment for the preparation of sluiceway subgrade (grading) shall be measured and paid for at the Contract Unit Price calculated to the nearest ton (TN) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the grading of any other material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
2. **Crushed Stone Weir Base Material/Installation.** Payment for the installation of crushed stone weir base material shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, materials, spreading, mixing, rolling, compacting, grading, drying or adding water for desired compaction, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for crushed stone weir base material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.
3. **Riprap Material/Installation.** Payment for the installation of riprap shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to the performance of the work.

1.3 METHODOLOGY

Requests for progress payments and final payment shall be submitted by the Contractor and shall be validated by the Engineer to verify that the work for which payment is sought has been performed.

- a. Payments by the Owner shall be made in accordance with the payments clause of this Contract.
- b. The Contractor shall specify a cutoff date, to be the same date each pay period, for determining progress for invoicing purposes.

1.4 SUBMITTALS

Submit the following to the Engineer in accordance with Section 01 33 00 - Submittals.

Submittals are for the record or approval, as indicated.

- a. Schedule of Prices (Exhibit 01 20 00-A) shall be submitted for approval within seven (7) calendar days after Contract award and prior to mobilization at the project site.
- b. Invoice Submittals--Submit the following monthly:

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

1. Invoice on the Contractor's letterhead with Taxpayer I.D. Number for approval
2. Schedule of Prices updated with progress percentages for approval
3. Stated Construction Schedule for the record
4. Certification that required copies of subcontractors' proofs of insurance are complete and current for the record
5. Release of Claims for the record (with final invoice only).

PART 2 - PRODUCTS

None are required by this Section.

PART 3 - EXECUTION

3.1 SCHEDULE OF PRICES

The Schedule of Prices shall be as specified in Exhibit 01 20 00-A.

- a. The sum of the prices shall equal the total Contract fixed price. The Schedule of Prices shall reflect each work activity comprising the work to be performed. Percent progress per activity shall represent the current status, as shown on the construction schedule and verified by the Engineer.
- b. The Engineer may approve, disapprove, or require revisions to the Schedule of Prices. Subsequent revision to the Schedule of Prices must be approved by the Engineer.

3.2 DETERMINATION OF PROGRESS

The Contractor and the Engineer shall jointly review all work prior to submission by the Contractor of its periodic payment invoice and periodic progress report and seek to report a consensus regarding the percent of total progress achieved during the period. If the Engineer is unable to physically travel to the project site, progress shall be determined by telephone. The invoice shall be submitted for a dollar amount reflecting the percent of progress achieved during the period.

Final determination of progress and payment to be made, whether or not the Contractor and Engineer reach agreement, shall be by the Owner.

3.3 INVOICING AND PAYMENT

Invoices shall be prepared as specified herein.

- a. The Contractor shall invoice the Engineer on the Contractor's letterhead. Invoicing shall be based on the value of specific items in the Schedule of Prices, to which is applied the progress (percent completion) claimed for that item. All invoices shall be supported by a Schedule of Prices, stated Construction Schedule and Project "S" Curve, Taxpayer I.D.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Number, and certification that record drawings are complete as of the invoice period.

- b. The Contractor shall submit its invoice for periodic progress payment to the Owner.
- c. If satisfactory progress has not been made, the Owner may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved.
- d. The Owner will pay the final amount due to the Contractor under this Contract after:
 1. Completion, final inspection, and acceptance of all work
 2. Presentation of a properly executed invoice
 3. Presentation by the Contractor of a release of all claims against the Engineer and Owner arising by virtue of this Contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Release of Claims (Exhibit 01 20 00-B) shall be the form of this release.
 4. Deductions of any sums owed the Owner and permitted to be offset by law.

--End of Section--

LINCOLN LACE AND BRAID REMEDIATION PROJECT
 PROVIDENCE, RHODE ISLAND

EXHIBIT 01 20 00-A
 SCHEDULE OF PRICES
 LINCOLN LACE AND BRAID REMEDIATION PROJECT

Bid Item #	Item Description	Bid Quantities	Units	Unit Cost	Bid Cost	Invoice Quantities	Percent Complete	Invoice Amount This Period	Completed To Date
1	Mobilization/Demobilization	1	LS						
2	Temporary Facilities and Controls								
2-1	Clearing and Grubbing	1	LS						
2-2	Project Storage	1	LS						
2-3	Temporary Construction Entrance and Access Roads	1	LS						
2-4	Staging and Stockpile Areas	1	LS						
2-5	Installation and Removal of Erosion and Sediment Controls	1,400	LF						
2-6	Cofferdam and Dewatering	1	LS						
2-7	Security and Fencing	1	LS						
3	Survey Requirements	1	LS						
4	Wetland Restoration								
4-1	Planting Materials and Labor	1	LS						
5	Engineered Cap Construction, Non-Sluiceway								
5-1	Analytical Requirements	1	LS						
5-2	Excavation	3,200	CY						
5-3	Grading of Excavated Soil	3,800	CY						
5-4	Geotextile Material/Installation, Non-Woven	16,825	SY						
5-5	Procure Imported Gravel	3,920	CY						
5-6	Haul, Spread, and Compact Imported Gravel	3,920	CU						
5-7	Procure Imported Topsoil	1,960	CY						
5-8	Haul and Spread Imported Topsoil	1,960	CY						
5-9	Hydroseed	1	LS						
6	Engineered Cap Construction, Sluiceway								
6-1	Grading	415	CY						
6-2	Geo-grid Material & Installation	2,100	SY						
6-3	Geotextile Material & Installation	2,100	SY						
6-4	Furnish and Place 1.5" Crushed Stone Base Material	375	CY						
6-5	Coconut Fiber Erosion Control Matting	1,760	SY						
7	Check Dam Installation								
7-1	Furnish and Place Stone Weirs	6	TN						
7-2	Furnish and Place 4" Crushed Stone Base	5	CY						
7-3	Furnish and Place Riprap	30	CY						
Contract Total									
Performance Bond									
Billed Through Previous Period									
New Billing									

LINCOLN LACE AND BRAID REMEDIATION PROJECT
 PROVIDENCE, RHODE ISLAND

Lincoln Lace & Braid Remediation Project Quantity Estimate			
Bid Item #	Item Description	Units	Quantities
2	Temporary Facilities and Controls		
2-5	Erosion and Sediment Control Installation and Removal	LF	1,400
4	Wetland Restoration		
4-1-1	Virginia Rose 18-24"	EA	102
4-1-2	Washington Hawthorn 18-24"	EA	68
4-1-3	Sweet fern (<i>Comptonia peregrina</i>) #1	EA	2000
4-1-4	Hazelnut (<i>Corylus americana</i>) #3	EA	100
4-1-5	Staghorn sumac (<i>Rhus typhina</i>) #2	EA	100
4-1-6	Swamp Rose 18-24"	EA	30
4-1-7	Inkberry (<i>Ilex glabra</i>) 2.5-3' B&B	EA	30
4-1-8	Winterberry (<i>Ilex verticillata</i>) 3-4' B&B	EA	30
4-1-9	Spicebush (<i>Lindera benzoin</i>) #2	EA	30
4-1-10	Cattails BR	EA	750
5	Engineered Cap Construction, Non-Sluiceway		
5-1	Concrete Removal	SY	515
5-2	Concrete Perforation	SY	4720
5-4	Excavation	CY	3,250
5-5	Grading of Excavated Contaminated Soil	CY	3,950
5-6	Geotextile Material/Installation	SY	18,825
5-7	Procure Imported Gravel	CY	3,920
5-8	Haul, Spread and Compact Imported Gravel	CY	3,920
5-9	Procure Imported Topsoil	CY	1,960
5-10	Haul and Spread Imported Loam	CY	1,960
5-11	Hydroseed	SY	15,500
6	Engineered Cap Construction, Sluiceway		
6-1	Grading/Excavation	CY	415
6-2	Geo-Grid Material/Installation	SY	2,100
6-3	Geotextile Material/Installation	SY	2,100
6-4	Furnish and Place 1-1/2" Crushed Stone Base	CY	375
6-5	Coconut Blanket Erosion Control Matting/Installation	SY	3,760
7	Check Dam Construction		
7-1	Furnish and Place Wier Stones	TN	8
7-2	3/4" Crushed Stone Weir Base	CY	5
7-3	Furnish and Place Riprap (Class I)	CY	30

Notes:

- 1 Quantities assumes planting in accordance with the typical planting zones on the Contract Drawings.
- 2 Quantity assumes planting cattails on a 1 ft grid within the delineated area.
- 3 B&B = Ball and Burlap
- 4 # = Potted in listed size pot (in gallons)
- 5 BR = Bare Root

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

EXHIBIT 01 20 00-B
RELEASE OF CLAIMS

The undersigned contractor, pursuant to the terms of Contract No. _____ between the Owner and said Contractor for the Lincoln Lace and Braid Remediation Project located in Providence, Rhode Island, hereby releases the Owner from any and all claims arising under or by virtue of said Contract or any modification or change thereof.

Witness the signature and seal of the undersigned this _____ day of _____.

WITNESS:

(Signature)

(Address)

CONTRACTOR:

(Print or Type)

(Signature)

(Official Title)

SECTION 01 26 63
CHANGE PROCEDURE
(03/10)

PART 1 - GENERAL

1.1 SCOPE

The Contractor shall comply with this procedure in the process of giving notification of change and preparing and submitting a proposal for adjustment due to a desired, perceived, or actual change in the work. Changes in the work, or period of performance of the work, may be directed in writing by the Engineer or may be requested by the Contractor. In either case, payment for work accomplished under a modification may not be made until a formal Contract modification, incorporating the change into the Contract, has been issued and executed. Therefore, it is incumbent upon the Contractor to comply fully with this procedure and to expedite the resolution of changes.

1.2 CHANGE SUBMITTALS

When requested, the Contractor shall submit the following to the Engineer in accordance with Section 01 33 00 - Submittals:

- a. Proposal cover letter on the Contractor's letterhead
- b. Detailed price proposal
- c. Drawings or other explanatory data
- d. Time extension statement with justification if any time extension is requested.

1.3 COMPLIANCE

The Contractor shall take such measures as are needed to assure familiarity and compliance by its staff with these procedures. If change proposals are incomplete, unclear or ambiguous, or are not supported by adequate documentation, the data will be returned and the Contractor shall resubmit or supplement the proposal as requested by the Engineer. Delay resulting from the Contractor's noncompliance with this procedure shall not in itself constitute the basis for an extension in the time of performance under the Contract.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 PROCESSING CHANGES INITIATED BY THE ENGINEER

- a. The Engineer will initiate changes only in writing. The Owner will sign any Request for Proposal (RFP). This will establish a Proposed Change (PC) number, by which the change will be identified until such time as it may be incorporated into the Contract by formal modification.
- b. The Contractor may or may not be authorized to proceed with the changed work pending resolution of changes in the Contract price or time of

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

performance. If the work described in the RFP becomes critical to the timely performance of the Contractor's work, a written request for a notice to proceed must be forwarded to the Owner immediately. The Owner will issue any notice to proceed. This unilateral modification to the Contract may be subject to further negotiation regarding price and time for completion. Payment for changed work, covered by a unilateral modification, will not be made until a bilateral modification covering the changed work has been executed.

- c. The Contractor shall prepare and submit its proposal for change to include at a minimum:
1. A cover letter referencing the PC number and citing the attachments, if any, that constitute the Contractor's total proposal
 2. A detailed price proposal showing labor, construction equipment, and material quantities and prices at the lowest practical level of each element of the work
 3. Any drawings, sketches, catalog cuts, samples, certifications, or other data required to be submitted by the Engineer or that is required to fully document the Contractor's work under the proposed change.
 4. A statement of the proposed change in the time of completion of the Contract, together with all required justification for such a change.
 5. A statement to the effect that there is "no change in price and/or time of completion of the work under this Contract as a result of this proposed change" if that is the case.

The Owner may accept the Contractor's proposal without negotiation. Alternatively, upon receipt of a proposal that is satisfactory in form, the Engineer may require negotiation with the Contractor to arrive at a fair and equitable change in the Contract price and time of completion. Upon agreement, a Contract modification will be issued by the Owner for the Contractor's execution.

3.2 PROCESSING CHANGES INITIATED BY THE CONTRACTOR

Should the Contractor feel that a change to the work under the Contract, or to the Contract itself, is necessary or desirable, it shall propose such a change to the Engineer. This proposed change shall include a clear and concise description of the proposed change, along with that information cited in 3.1c above. Within a reasonable time, the Engineer will review the Contractor's proposal and determine if the proposed change is in the Owner's best interest. If so, the Contractor will be advised of this, and a PC number will be assigned to the Contractor's proposal. The process of agreement and codification of the price and time of completion for the change is then identical to that in 3.1 above.

3.3 PROSECUTING CHANGED WORK

The Contractor is cautioned not to proceed with the work described in a proposed change until it is authorized to do so in writing by the Engineer.

--End of Section--

SECTION 01 32 13
CONSTRUCTION SCHEDULES
(03/10)

PART 1 - GENERAL

1.1 SCOPE

Work included in this Section consists of preparation, submittal, and updating of the project schedules and reports.

1.2 SUBMITTALS

Submit the following to the Engineer in accordance with Section 01 33 00 - Submittals. Submittals are for the record or approval as indicated.

- a. Proposed construction schedule shall be submitted for approval within 5 calendar days after receipt of Notice to Proceed
- b. Submit Contract Daily Activity Reports to the Engineer for the record on a weekly basis
- c. Submit construction schedule status as backup to progress invoices.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 CONSTRUCTION SCHEDULE

The construction schedule shall show all work activities for completion of the work to be performed under this Contract and will reflect the Contractor's general sequential approach to the work. The construction schedule will be in either arrow diagram, precedence diagram, or bar chart format. The minimum level of detail (number of activities) shall include the activities described in the Schedule of Prices, the inspection hold points set forth in Section 01 10 13 - Summary of the Work. The construction schedule shall demonstrate completion of all work within the period of performance of the Contract in a reasonable and achievable manner.

3.2 PERIODIC SCHEDULE UPDATES

The Contractor shall support periodic payment requests with an approved construction schedule marked to indicate progress. Submit updated schedule on or before noon each Friday for subsequent two weeks. While the construction schedule may undergo periodic revisions as discussed below, the marked versions shall clearly show the progress history through the current invoice period.

When in the opinion of the Engineer changes in the work occur that significantly affect the schedule, the Contractor shall submit a revised construction schedule for approval. The revised construction schedule shall be submitted within 10 calendar days after it is requested by the Engineer.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

The current approved construction schedule shall be used as a baseline for progress reporting.

3.3 CONTRACT DAILY ACTIVITIES REPORT

The Contractor shall maintain a daily record of actions, events, and manpower utilized. This report shall be completed and submitted to the Engineer at the end of each week. Reports are to be complete and accurately describe actions and events.

--End of Section--

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Documents and Contract Drawings. The Contractor shall make any and all corrections required by the Engineer.

Shop drawings shall be reviewed and returned within 10 working days of receipt of drawings at jobsite.

Shop drawings and all supporting data, catalogs, or similar information shall be prepared by the Contractor or his suppliers and subcontractors but shall be submitted as instruments of the Contractor.

The Engineer's review of shop drawings will be general only and shall not relieve the Contractor from responsibility for errors and omissions of any sort, for deviations from Drawings or Specifications, or for conflict with the work of others that may result from such deviations. The Engineer's review of shop drawings will not relieve the Contractor of the responsibility to complete the work in accordance with the requirements of the Contract Documents.

After Notice of Award, the Contractor shall submit a Drawing Submittal Schedule to the Engineer. The Contractor's drawing schedule shall be brought up to date from time to time to show the latest changes, omissions, and additions. The Schedule will be based on the Contractor's Construction Schedule and will show when the Contractor will submit the drawings and when he expects them to be returned so that construction activities shown on the Construction Schedule are not interrupted. There will be a minimum of three weeks between these two activities. Specific methods and routines for handling drawing reviews shall be established in advance within the general framework of the Contract Documents.

Work for which the Contractor's submittals are required shall not be started until the submittals have been reviewed and accepted in writing by Engineer. Any revision by the Contractor of a previously accepted submittal must be accepted in writing by Engineer before implementation.

1.3 SAMPLES

The Contractor shall, at his expense, furnish the Engineer with samples of the various materials and finishes thereon specified as requiring samples in the various portions of this Specification and intended to be used on or in the work. Samples shall be sent to the office of the Engineer, carriage prepaid, unless otherwise specified by the Engineer or this Specification. Samples will be returned to the Contractor if requested, carriage collect.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

-- END OF SECTION --

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

SECTION 01 33 00
ATTACHMENT 1

SUBMITTAL SUMMARY TABLE

NOTES:

1. This table is intended to summarize all submittals required by the Contract. Where a submittal is called for in the Specification or Contract but is not itemized herein, the number of copies and distribution will be same as similar documents listed unless directed otherwise by the Engineer.
2. Legend:

A - Approval Required
R - Project Record
3. The number and type of documents submitted for all submittals that include drawings will be as specified in the Submittals and Substitutions section or related sections.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
 PROVIDENCE, RHODE ISLAND

Submittal No.	Description	Spec Section	Date Received	Date Response	EA Reviewer	Recommended Action
1	Schedule of Prices	01 20 00				
2	Dewatering Plan	01 20 00				
3	Safety Plan	01 32 13				
4	Project Sign Schematic	31 25 00				
5	Erosion Controls Specification and Installation Instructions	01 32 13				
6	Construction Schedule	01 32 13				
7	Surveyor Qualifications	01 32 13				
8	Measurement for Payment Surveys	01 32 13				
9	Final Survey Record	01 32 13				
10	Geogrid Certification / Specification/Installation Instructions	31 00 00				
11	Geotextile Certification / Specification/Installation Instructions	31 00 00				
12.1	Sluiceway Base Course Material Source Letter & Sieve Analysis	01 50 00				
13	Erosion Control Matting Specifications & Installation Instructions	31 00 00				
14.1	Imported Gravel Analytical	31 00 00				
14.2	Imported Gravel Source Letter & Sieve Analysis	31 00 00				
15.1	Imported Topsoil Analytical & Organics	31 00 00				
15.2	Imported Topsoil Source Letter & Sieve Analysis	31 00 00				
16	Seed Mix	32 92 19				
17	Plantings List	32 92 43				
18	Plantings Warranties	32 92 43				
19	Record Drawings	01 77 00				
20	Record Specifications	01 77 00				
21	Warranty Manual	01 78 00				
CO 00#	Change Request(s)	01 26 63				
RFI 00#	Request for Interpretation(s)	01 45 00				
SR 00#	Product Substitution Request(s)	01 60 00				

SECTION 01 35 26
SAFETY
(02/10)

PART 1 - GENERAL

1.1 SCOPE

The Contractor shall be responsible for compliance with the state and federal Occupational Safety and Health Act (OSHA) requirements when applicable.

1.2 SUBMITTALS

Submit the following to the Engineer in accordance with Section 01 33 00 - Submittals. Submittals are for the record or approval, as indicated.

- a. Site Safety Representative designation, for the record.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 CONTRACTOR SAFETY REPRESENTATIVE

Prior to commencement of work at the site, the Contractor shall designate in writing the name of its representative, who will ensure Contractor compliance with safety requirements.

3.2 COMPLIANCE

The Contractor shall comply with the requirements of the OSHA Manual.

- a. The Contractor shall promptly correct any non-complying work or conditions. The Contractor shall be responsible to ensure its work does not affect the safety of the public or employees of the Engineer. Neither the Engineer nor its representatives shall bear any responsibility for safety precautions at the project work site. If, however, in the opinion of the Engineer, a life-threatening condition exists, the Engineer will orally (to be confirmed in writing) require the Contractor to immediately suspend work in the affected area until the condition is corrected. Whenever the Contractor's operations may create a hazardous condition, it shall at its sole expense, furnish, install and maintain such flagmen, guards, fences, barricades, railings, lights, signs, or other devices necessary to prevent accidents, injury or damage to people and equipment.
- b. The Contractor shall determine the location of the paramedic unit, medical facility or hospital nearest to the project site to be used for medical emergencies. The name, telephone number, location and a route map to these facilities shall be prominently posted at the project site. Telephone numbers of the local fire and police departments shall be prominently displayed.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

3.3 RECORDKEEPING

The Contractor shall maintain all required OSHA records. Records of safety performance shall be available at the project site for inspection upon request of the Engineer or the state.

--End of Section--

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

SECTION 01 42 19
REFERENCE STANDARDS
(03/10)

PART 1 - GENERAL

1.1 SCOPE

This Section covers the reference standards used in this specification.

1.2 QUALITY ASSURANCE

Application: When a standard is specified by reference, the Contractor shall comply with the requirements and recommendations stated in that standard, except when requirements are modified by this Specification or applicable codes establish stricter standards.

Publication Date: Wherever a code or standard is dated in this Specification, the revision or edition in effect at the time the bids are received by Owner shall apply.

1.3 ABBREVIATIONS, NAMES, AND ADDRESSES OF ORGANIZATIONS

The Contractor shall obtain copies of referenced standards direct from publication source, when needed for proper performance of the Work or when required for submittal by this Specification.

ACI: American Concrete Institute
P.O. Box 9094
Farmington Hills, Mi 48333

ASTM: American Society of Testing and Materials
1916 Race Street
Philadelphia, PA 19103

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

-- END OF SECTION --

SECTION 01 45 00
QUALITY CONTROL
(03/10)

PART 1 - GENERAL

1.1 SCOPE

This Section provides the requirements for Contract Quality Control pertaining to the Work including:

- a. Quality Control of products and workmanship
- b. Manufacturer's instructions
- c. Manufacturer's certificates and field services.

1.2 RELATED WORK

Section 01 42 19 - Reference Standards

Section 01 33 00 - Submittals

1.3 WORKMANSHIP

Comply with industry standards of the region except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

Provide suitably qualified personnel to produce Work of specified quality. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

Provide finishes to match approved samples.

1.4 MANUFACTURER'S INSTRUCTIONS

Require compliance with instructions in full detail, including each step in sequence.

Should instructions conflict with the Contract Documents, request clarification from the Engineer before proceeding.

1.5 MANUFACTURER'S CERTIFICATES

When required in individual Specifications section, submit manufacturer's certificate, in duplicate, certifying that products meet or exceed specified requirements.

1.6 TESTING LABORATORY SERVICES

The Contractor shall employ and pay for services of an Independent Testing Laboratory to perform the inspections, tests, and other services required by the individual Specification Sections.

The services will be performed in accordance with the requirements of governing authorities and with specified standards.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

The reports will be submitted to the Engineer in duplicate giving observations and results of the tests, indicating the compliance or non-compliance with specified standards and with the Contract Documents. The Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.

- a. Notify the Engineer and Testing Laboratory 24 hours prior to expected time for operations requiring testing services.
- b. Make arrangements with the Testing Laboratory and pay for additional samples and tests for the Contractor's convenience.

1.7 MANUFACTURER'S FIELD SERVICES

When required in individual Specifications section, have manufacturer provide qualified representative to observe field conditions, conditions of surfaces and installation, quality of workmanship, and start-up of equipment as applicable, and to make written report of observations and recommendations to Engineer.

1.8 AUTHORITY OF THE ENGINEER

The Engineer or Owner's representative, with permission from the Owner, will decide all questions which may arise as to the quality and acceptability of materials furnished. All questions which may arise as to the interpretation of the Contract Drawing and Specifications shall be determined by the Engineer.

The Engineer will not be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and Engineer will not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents.

The Engineer will not be responsible for the acts or omissions of the Contractor or any subcontractors, or of the agents or employees of any Contractor or subcontractor, or of any other persons at the site or otherwise performing any of the Work.

1.9 DRAWINGS AND WORKING DRAWINGS

The approved Contract Drawing and Specifications on file in the office of the Engineer will show the location, detail, and dimensions of the Work.

These Contract Drawings shall be supplemented by the Contractor with such additional working and detail drawings as may be found necessary to adequately control the Work and its prosecution. The Contractor's drawings shall be furnished as specified in Section 01 33 00 - Submittals to allow the Engineer time to review the drawings. When requested, the Contractor shall furnish his basic calculations.

1.10 COORDINATION OF DRAWINGS AND SPECIFICATIONS

The Contractor shall take no advantage of any apparent error or omission in the Contract Drawings or Specifications. In the event the Contractor discovers such an error or omission, he shall immediately notify the

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Engineer. After consultation with the Engineer, the Engineer will make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the Contract Drawings and Specifications.

When general reference is made on the Contract Drawings or within the Specifications to any cited Standard Specifications, it shall refer to the current edition of such Specifications or the latest revision thereof or interim Specifications adopted and in effect on the date of Effective Date of Agreement. In the event of a conflict between the Contract Drawings and the specifications, the Engineer shall be notified to provide a clarification to the Contractor.

1.11 COOPERATION WITH UTILITIES

The Contractor will notify all utility companies, all pipe line owners, or other parties affected and endeavor to have all necessary adjustments of the public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction made as soon as practicable. Water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals, and all other utility appurtenances within the limits of the proposed construction which are to be relocated or adjusted are to be moved by the Contractor or his designated agents, except as otherwise provided for or in the Supplemental Conditions or as noted on the Contract Drawings. In the case of utility lines, the Contractor shall coordinate with the respective utilities for their removal and relocation.

Attention is directed to the possible existence of underground facilities not known to the Engineer or in a location different from that which is shown on the Contract Drawings. The Contractor shall take steps to ascertain the exact location of all underground facilities prior to doing work that may damage such facilities or interfere with their service.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

-- END OF SECTION --

SECTION 01 50 00
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
(02/10)

PART 1 - GENERAL

1.1 SCOPE

The Contractor shall furnish and install all required temporary facilities and site access as shown or specified herein plus such facilities and equipment required for proper performance of the requirements of the Contract Documents and Drawings.

1.2 REFERENCED DOCUMENTS

Pertinent provisions of the following listed codes and standards shall apply to the Work of this Section, except as they may be modified herein, and are hereby made a part of this Specification to the extent required:

- a. Associated General Contractors of America (AGC): Manual of Accident Prevention in Construction
- b. Building Officials and Code Administrators (BOCA): National Building Code.

All required temporary facilities and equipment shall also be in accordance with applicable federal, state, county, and utility laws, rules, and regulations. Nothing in these Specifications shall be construed to permit work not conforming to applicable laws and regulations.

1.3 ADMINISTRATION AND CONSTRUCTION YARD AREA

The contractor acknowledges that he has satisfied himself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the Contract Drawings and specifications made a part of this Contract. Any failure of the Contractor to acquaint himself with available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of the information made available by the Owner.

The Contractor's operation areas are those areas assigned by the Owner to the Contractor for the various operational activities shown on the Contract Drawings. They will encompass all of the areas of construction activity, including work and storage areas. The Contractor shall confine all operations to the Owner's premises unless otherwise permitted by the Owner. The Contractor shall, under regulations prescribed by the Owner, use only established roads on Owner's premises or construct and use such temporary roadways as may be authorized by Owner. When curbs and sidewalks must be crossed, the Contractor shall provide protection against damage and shall be obligated to replace or repair any damaged roads, curbing, and walkways at the Contractor's expense.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

The Contractor shall provide and maintain adequate barricades, signs, lighting, personnel, and other control devices for the proper protection and control of operations and the safety of the public.

The Contractor shall comply with any safety program required by Owner or Engineer. The Contractor shall comply with all OSHA safety protocols. Such program will require filing of all accident and injury reports with Engineer and attendance at a weekly safety meeting by the Contractor's supervisory personnel.

The Contractor shall remove snow and ice from all work areas, lay-down areas, parking lots, and walks, when necessary to ensure the safe and effective performance of the Work, at no additional cost to Owner.

1.4 STAGING AND STOCKPILE AREA

The Contractor shall construct staging and stockpile areas in accordance with the Soil Management Plan (SMP) and at the locations shown on the Contract Drawings. Fencing of materials or equipment will not be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area.

Impacted native soils excavated from within the 100-year floodplain shall be placed in proposed fill areas outside of 100-year floodplain boundary prior to construction of the engineered barrier. Temporarily stored impacted native soils shall be staged in the designated stockpile areas at the locations shown on the Contract Drawings. Within reason, the storage location will be selected to limit the unauthorized access to the materials (i.e., away from public roadways/walkways). Regulated soil shall not be stockpiled onsite for greater than 60 days without prior approval.

Excavated impacted (or non-impacted) native soil is to remain onsite in accordance with the SMP. The soil will be placed on and covered with polyethylene/plastic sheeting during the entire duration of its staging and secured with appropriate controls to limit the loss of the cover and protect against stormwater and/or wind erosion (hay bales, silt fencing, rocks, etc).

Excavated stockpiled material proposed for reuse beneath the engineered cap will be tested by analyzing one sample per 500 yd³ of excavated material for arsenic, lead, and mercury, if visual or olfactory observation indicates the soil may be impacted with petroleum or volatiles, the soil will be analyzed for TPH (via EPA Method 8100) and VOCs (via EPA Method 8260) at a frequency of one sample every 500 yd³ of observed impacted material. This material will be stockpiled separately prior to direction by the Engineer. Analytical results will be provided to the Engineer for written approval prior to the material being installed and graded or disposed at an approved disposal facility. Copies of all analytical results will be provided to the Engineer as part of the closure documentation.

1.5 ACCESS ROADS

The Contractor shall construct temporary access roads suitable for the movement of construction equipment and vehicles. The locations and dimensions of the temporary access roads shall be as shown on the Contract Drawings. All temporary access roads shall have a stabilized construction entrance prior to connecting to public roads. Wheels of construction

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

equipment shall be cleaned on the stabilized construction entrances prior to entrance onto public roads.

The Contractor shall maintain access roads in a sound condition and properly graded, free of ruts, washboard, potholes, ponding, ice, snow, mud, and soft material, and free of excavated materials, construction equipment, and products and maintain access roads throughout the Contract period to ensure unimpeded access at all times for construction vehicles.

Prior to demobilization, the Contractor shall remove temporary access roads and restore the underlying surfaces to their original condition. All vegetated areas disturbed for the purposes of constructing temporary access roads shall be seeded in accordance with Section 32 92 19 - Seeding.

1.6 TEMPORARY SANITARY FACILITIES

The Contractor shall provide adequate temporary sanitary conveniences for the use of all employees and persons engaged in the Work including subcontractors, Owner, Engineer and their employees, as required by laws, ordinances, or regulations of public authorities having jurisdiction. Toilet facilities shall be enclosed chemical toilets or water closets and urinals connected to a holding tank and shall meet with the approval of public authorities having jurisdiction. Open pit or trench latrines will not be permitted.

1.7 ELECTRICAL POWER

The Contractor shall provide their own electrical power for construction purposes and shall also provide temporary outdoor lighting for construction operations, as required.

1.8 TEMPORARY WATER

The Contractor shall provide and maintain water for its own domestic and construction use and that of the other contractors.

1.9 CONSTRUCTION EQUIPMENT

The Contractor shall erect, equip, and maintain all construction equipment required for the Work in accordance with all applicable statutes, laws, ordinances, rules, and regulations of the Owner or other authority having jurisdiction.

Construction equipment and temporary work shall conform to all the requirements of state, county, and local authorities, OSHA, and underwriters that pertain to operation, safety and fire hazard. The Contractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for by these Specifications. Contractor shall not refuel equipment within, or in proximity to, areas delineated as wetlands.

1.10 STORAGE BUILDINGS AND SHOPS

The Contractor shall provide all temporary storage buildings and shop rooms that may be required at the site and in the administration and construction yard area for safe and proper storage of tools, materials, and equipment. The Contractor shall store construction materials and equipment within boundaries of designated areas. Storage of gasoline or similar fuels and

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

explosives shall be confined within definite boundaries apart from buildings as approved by authorities having jurisdiction. The Contractor shall receive, unload, store, and provide all handling for all materials used in the Work.

1.11 FIRST AID FACILITIES

The Contractor shall provide and maintain first aid equipment in the various work areas and shall provide for the treatment of minor injuries. The Contractor shall designate personnel with proper qualifications to administer first aid. The Contractor shall be responsible for making prompt arrangements with local hospitals for transportation and treatment of major injuries. The Contractor's first aid facilities shall be made available to other contractor's and Owner's personnel.

1.12 NATURAL ENVIRONMENT

The Contractor shall comply with all state and federal laws, rules, and regulations pertaining to the preservation and protection of the natural environment.

1.13 DISPOSAL OF MATERIALS

All material from required demolition, excess excavation, and any other debris shall become property of the Contractor unless otherwise noted in this Specification. The soil excavated during construction is to remain onsite. The Contractor shall obtain all necessary permits for demolition debris disposal and shall send the permits or copies to Owner before any material is removed from the Site. The location of the disposal site and the manner of disposal will be subject to the prior acceptance of Owner.

1.14 SECURITY AT SITE

The Contractor shall be responsible for site security.

1.15 TRAFFIC REGULATION

Furnish all materials and perform all work necessary to completely regulate traffic in the area of work being performed under the Contract. Perform all work in such a manner as to provide safe passage at all times for the public with a minimum of obstruction to traffic. Do not close road or streets to passage without the permission of the proper authorities. Notify all police and fire departments of all scheduled detours and when road or streets are reopened.

1.16 REMOVAL AT COMPLETION

Upon completion of the Work, or prior thereto when so directed by the Owner, the Contractor shall remove all temporary facilities structures and installations, including all concrete foundations. Similarly, the Contractor shall return all areas utilized for temporary facilities to their original, natural state.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Not used

-- END OF SECTION --

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

SECTION 01 60 00
MATERIAL AND EQUIPMENT
(03/10)

PART 1 - GENERAL

1.1 SCOPE

This Specification Section includes the requirements for the transportation, handling, storage, and protection of materials and equipment as specified herein and in the various Sections of these Specifications. This Section also addresses the procedure for Contractor-proposed product substitutions.

1.2 MANUFACTURER REQUIREMENTS

In general, the Contractor shall receive, handle, and store materials and equipment in accordance with manufacturer's recommendations and in a manner which will protect such items from damage or deterioration.

PART 2 - PRODUCTS

2.1 GENERAL

Products include the material, equipment, and systems used on this Project. Comply with the Specifications and referenced standards as minimum requirements.

2.2 TRANSPORTATION AND HANDLING

The Contractor shall receive, handle, and store materials and equipment supplied by him in a manner that will protect such items from damage or deterioration in accordance with procedures provided by manufacturers and Owner.

Promptly inspect the shipments to assure that the products comply with requirements, the quantities are correct, and the products are undamaged.

2.3 STORAGE AND PROTECTION

Materials and equipment shall be stored off the ground on blocking or pallets and shall be covered for protection from vandalism and weather damage. Materials and equipment shall be stored, tested, and cleaned prior to use, in accordance with this Specification and all specific manufacturers' requirements. Damaged or nonconforming items shall be removed immediately to a separated storage area for expeditious removal from site.

The Contractor shall provide a secure outside storage area in the vicinity of the site. In addition, the Contractor shall provide inside storage for components requiring special protection. The Owner is in no way responsible for materials and/or equipment stored onsite.

2.4 PRODUCTS LIST

Submit a complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product, in accordance with Section 01 33 00 of this specification.

2.5 SUBSTITUTIONS

Substitutions will be considered only when a product becomes unavailable due to no fault of the Contractor or when deemed appropriate by the Engineer. Document each request with complete data substantiating the compliance of the proposed substitution with the Contract Documents.

The request constitutes a representation that the Contractor:

- a. Has investigated proposed product and determined that it meets or exceeds, in all respects, the specified product
- b. Will provide the same warranty for substitution as for the specified product
- c. Will coordinate installation and make other changes which may be required for the Work to be complete in all respects
- d. Waives claims for additional costs which may subsequently become apparent.

Substitutions will be considered when they are indicated or implied on shop drawings or product data submittals without separate written request, or when acceptance will require substantial revision of the Contract Documents.

The Engineer will determine acceptability of the proposed substitution, and will notify the Contractor of acceptance or rejection in writing within a reasonable time.

Only one request for the substitution will be considered for each product. When substitution is not accepted, the Contractor shall provide the specified product.

2.6 REJECTED MATERIALS AND DEFECTIVE WORK

Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.

Any errors, defects, or omissions in the execution of work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.

The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect error, omission or act of the contractor or his employees, as determined by the Engineer, occurring previous to the final payment.

PART 3 - EXECUTION

Not Used

-- END OF SECTION --

SECTION 01 71 23
SURVEY REQUIREMENTS
(02/10)

PART 1 - GENERAL

1.1 SUMMARY

This section describes construction-related surveying activities and associated requirements. The Contractor shall establish the exact position or location of all work control points. All work shall be referenced to and established from the control points, re-established where necessary, and maintained throughout the duration of the project.

1.2 DATUM

All survey work shall be performed using Rhode Island State Plane Coordinate System, NAD 83 (US survey feet). Vertical datum for all survey work shall be NGVD 29 datum. All design information depicted on the Contract Drawings is in Rhode Island State Plane Coordinates, NAD 83 (US survey feet) and referenced to NGVD 29, unless otherwise noted.

1.3 SURVEYOR

All survey work performed for the purposes of construction control, payment basis, or as-built documentation shall be performed by a qualified land surveyor currently registered in Rhode Island.

1.4 SUBMITTALS

a. Surveyor Qualifications

Prior to start of any survey work, the Contractor shall submit name, address, telephone number, and qualifications of the surveyor, crew chief, superintendent and all other persons who are proposed to perform surveys or survey related duties on which measurement and payment shall be based, to the Engineer for approval. Upon request by the Engineer, the Contractor shall submit documentation verifying the accuracy of the survey work.

b. Measurement for Payment Surveys

The Contractor shall submit a survey record with computations signed by the Surveyor and the Contractor's field superintendent of measurement surveys conducted to determine quantities of unit cost work and percent of completed lump sum work for payment. All measurement surveys for elevation shall be to the nearest 0.1 ft plus or minus 0.02 ft and for horizontal distances shall be to plus or minus 0.1 ft.

c. Survey Record

The Contractor shall submit a survey record with computations signed by the Surveyor, certifying that elevations and locations of site constructed features are in conformance, or nonconformance, with Contract documents. Any nonconformance shall be subject to review and acceptance by the

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Engineer prior to final disposition (i.e., payment, corrective actions, etc.)

d. Metes and Bounds of Contaminated Site

The Contractor shall submit a Class I Survey Metes and Bounds delineating the extent of the engineered barrier and the sluiceway, defining the contaminated "Site." Any nonconformance shall be subject to review and acceptance by the Engineer prior to final disposition (i.e., payment, corrective actions, etc.)

1.5 PROJECT RECORD DOCUMENTS

a. Survey Log

The Contractor shall maintain onsite a complete, accurate log of survey work as it progresses.

b. Record Documents

Upon completion of the work, the Contractor shall submit Record Documents to the Engineer under the provisions of Section 01 33 00 - Submittals.

PART 2 - PRODUCTS

2.1 SURVEYS

a. Control Surveys

Control surveys shall include surveys for the establishment of benchmarks and control points. All control surveys for elevation shall be plus or minus 0.01 ft and for horizontal control, angles shall be to the nearest 20 seconds plus or minus 10 seconds and measured distances shall be to plus or minus 0.01 ft.

b. Measurement Surveys

Measurement surveys shall include surveys to verify as-built construction to the lines and grades indicated on the Drawings and to establish quantities for payment. All measurement surveys for elevation shall be to the nearest 0.1 ft plus or minus 0.02 ft and for horizontal distances shall be to plus or minus 0.1 ft.

2.2 MATERIALS

The Contractor shall provide all materials as required to properly perform the surveys, including, but not limited to, instruments, tapes, rods, measures, mounts and tripods, stakes and hubs, nails, ribbons, other reference markers, and all else required. All material shall be of sound professional quality.

All lasers, transits, and other instruments shall be calibrated and maintained in accurate calibration throughout the execution of the work.

PART 3 - EXECUTION

3.1 SURVEY MONUMENTS

Existing survey control monuments are shown on the Contract Drawings. The Contractor shall protect these monuments throughout the course of the project. The Contractor shall notify the Engineer immediately of loss, damage, or destruction of any survey monument. In the event of loss, damage, or destruction, the Contractor shall replace the monument(s) in kind with survey monument(s) of comparable or better accuracy. Replacement monuments shall be installed and located under the direction of a licensed land surveyor currently registered in Rhode Island. At his discretion, the Contractor may install additional survey monuments to support construction activities.

3.2 STAKEOUT AND EXISTING CONDITIONS SURVEYS

Prior to initiating any earthwork activities, the Contractor shall perform a stakeout survey to establish the limits of disturbance (LOD), baseline of construction, and grade stakes. No deliverables are required for the stakeout survey.

3.3 SURVEYS FOR MEASUREMENT AND PAYMENT

The Contractor shall perform surveys to determine quantities of unit cost work and percent of completed lump sum work including surveys to establish measurement reference lines and shall notify the Engineer prior to starting work. Excavation and fill requiring measurement by volume shall be surveyed by measuring elevations along cross-sections spaced at a maximum of every 5 ft along the longitudinal direction of the excavation or fill or at break points in the horizontal alignment of the excavation or fill as needed to obtain a representative quantity estimate. Along each cross-section, elevations shall be measured at points of changes in slope. The Contractor's surveyor shall perform cross-section survey of the river channel before excavation begins to verify original grade elevations.

The Contractor's field superintendent shall sign surveyors' field notes or shall keep duplicate field notes and shall calculate and certify quantities for payment purposes.

3.4 AS-BUILT SURVEY

The Contractor may perform survey activities as frequently as he deems necessary to control the project operations and provide sufficient documentation for payment requests. However, at a minimum, the Contractor shall perform an as-built survey to document constructed conditions in all work areas under this Contract. The as-built survey for each work area shall extend beyond the limits of the work to include a minimum of 50 ft of undisturbed adjacent area around the work area. The as-built survey shall conform to the National Map Accuracy Specifications and shall include, at a minimum, the following:

- Grade breaks
- Ground spot elevations on a maximum 50-ft grid spacing
- Buildings, bridges, slabs, and other permanent manmade features
- Width and elevation of the check dam structures
- Edges of upland buffer vegetation
- Tree and brush lines
- Edges of riprap armoring.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

For each of the above-listed items, the as-built survey shall include both existing and newly constructed items.

3.5 METES AND BOUNDS OF CONTAMINATED "SITE"

The contractor shall provide to the Engineer the metes and bounds of the Class I boundary survey defining the extent of the contaminated site for the recording of the environmental land use restriction. The contaminated site shall be defined as the extent of the engineered barrier and the sluiceway. The metes and bounds deliverable shall be stamped, signed, and dated by a licensed land surveyor currently registered in Rhode Island.

3.6 SURVEY DELIVERABLES

The Contractor shall provide to the Engineer the as-built survey for the entire project. The results of this survey shall be transmitted to the Engineer in both electronic (AutoCAD 2004 or more recent DWG file) and hard copy format. Each hard copy shall be D-size (24 in. x 36 in.) and shall contain a title block with the name and address of the Contractor. Each hard copy shall be stamped, signed, and dated by a licensed land surveyor currently registered in Rhode Island. The number of hard copies shall be in accordance with the requirements of Section 01 33 00 - Submittals specification. Both the electronic file and hard copies of the as-built survey shall depict surveyed site topography with 1.0-ft contours.

The contractor shall provide to the Engineer the metes and bounds of the Class I boundary survey defining the extent of the contaminated site for the recording of the environmental land use restriction. The contaminated site shall be defined as the extent of the engineered barrier and the sluiceway. The metes and bounds deliverable shall be stamped, signed, and dated by a licensed land surveyor currently registered in Rhode Island.

Individual survey shots shall also be depicted along with the spot elevations and point descriptions (e.g., top slope, toe slope, edge of flow constrictor, etc.). The electronic file of the as-built survey shall contain all of the linework depicted on the hard copies as well as the digital terrain model (DTM) that was used to generate the depicted contours.

-- END OF SECTION --

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

SECTION 01 77 00
PROJECT CLOSEOUT
(02/10)

PART 1 - GENERAL

1.1 SUMMARY

This Section specifies administrative and procedural requirements for the project closeout including but not limited to:

- Project record document (as-built drawings) submittal.

Closeout requirements for specific construction activities are included in the General Conditions and appropriate Sections in Division 2 through 31.

1.2 RECORD DOCUMENT SUBMITTALS

Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer reference during normal working hours.

1.2.1 Record Drawings (As-Built)

Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Upon completion of work, submit record drawings to the Engineer.

1.2.2 Record Specifications

Maintain one complete copy of the Project Manual, including addenda. Mark these documents to show substantial variations in actual Work performed in comparison with the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data. Upon completion of the Work, submit record Specifications to the Engineer.

PART 2 - PRODUCTS

Not Used

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

PART 3 - EXECUTION

3.1 REMOVAL OF PROTECTION

Remove temporary protection and facilities installed for protection of the Work during construction.

-- End of Section -

SECTION 01 78 00
WARRANTIES
(2/10)

PART 1 - GENERAL

1.1 SUMMARY

This Section specifies general administration and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

- a. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials
- b. General closeout requirements are included in Section "Project Closeout"
- c. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Divisions 2 through 31.

1.1.1 Disclaimers and Limitations

Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.2 DEFINITIONS

1.2.1 Standard Warranties

Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Engineer.

1.2.2 Special Warranties

Special warranties are written required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Engineer.

1.3 WARRANTY REQUIREMENTS

1.3.1 Related Damages and Losses

When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for corrections of warranted Work.

1.3.2 Reinstatement of Warranty

When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

1.3.3 Replacement Cost

Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Engineer has benefited from use of the Work through a portion of its anticipated useful service life.

1.3.4 Owner's Recourse

Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights and remedies.

1.3.4.1 Rejection of Warranties

The Engineer reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents. The Engineer reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work until evidence is presented that entities required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

Submit the following in accordance with conditions of the Contract and Division 1 specification Section 01 33 00 - Submittals.

1.4.1 Standard Warranties

Submit written warranties prior to the date certified for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request.

When a designated portion of the Work is completed and occupied or used by the Engineer, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.

1.4.2 Special Warranties

When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document by the required parties. Submit a draft to the Engineer for approval prior to final execution.

Refer to individual Sections of Divisions 1 through 31 for specific content requirements, and particular requirements for submittal of special warranties.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

1.4.3 Form of Submittal

At Final Completion compile two copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

- a. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of product, and the name, address and telephone number of the installer.
- b. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name of the Contractor.

1.5 WARRANTY PERIOD

All warranties required by the Contract documents shall commence on the date of Final Acceptance.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

-- End of Section -

SECTION 02 41 00
DEMOLITION
(08/08)

PART 1 - GENERAL

This work shall consist of the removal, hauling, stockpiling, installation, and grading of the existing concrete foundations and asphalt pavement, as specified in the project plans.

1.1 REFERENCES

Not Used

1.2 UNIT PRICE - BASIS OF MEASUREMENT AND PAYMENT

- a. Concrete Foundations and Asphalt Pavement Demolition and Installation
 - 1. Basis of Measurement: Per square yard of asphalt removed.
 - 2. Basis of Payment: Payment shall constitute full compensation for furnishing all materials, equipment, plant, and tools; and for all labor and other incidentals necessary to complete work required by this section of the specification.

1.3 SUBMITTALS

The Contractor shall furnish the Engineer with a copy of disposal agreements and proof of proper disposal. Submittal shall be in accordance with SECTION 01 33 00 - SUBMITTALS specification.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 ASPHALT REMOVAL AND INSTALLATION

The Contractor shall remove the existing asphalt pavement surface as required to excavate within the 100-year floodplain. Removal of asphalt outside of the 100-year floodplain is not required.

3.2 DEMOLITION AND INSTALLATION OF EXISTING CONCRETE FOUNDATIONS

The Contractor shall demolish and remove the concrete foundations as required to excavate within the 100-year floodplain (within areas of Cover System 1). Concrete will be crushed to an appropriate size to prevent the formation of significant voids during installation of the material in Area 2. Removal of concrete foundation outside of the 100-year floodplain is not required. In areas outside of Cover System 1, the concrete will be perforated using a hoe ram to allow sufficient drainage. The concrete will be perforated on a 10 ft grid or as directed by the Engineer.

- - END OF SECTION - -

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

SECTION 31 00 00
EARTH WORK
(02/10)

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 1556	Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. [2,700 kN-m/cu.m.])
ASTM D4632	Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D4833	Test Method for Puncture Resistance of Geotextiles
ASTM D4491	Test Method for Water Permeability of Geotextiles
ASTM D4751	Test Method for Determining Apparent Opening Size of Geotextiles
ASTM D4533	Test Method for Index Trapezoidal Tearing Strength of Geotextiles

1.2 UNIT PRICE - BASIS OF MEASUREMENT

1.2.1 Analytical Requirements

- a. Basis of Measurement: Lump Sum.
- b. Analytical requirements will not be measured but will be paid for at the Contract Lump Sum Price. The payment will be full compensation for the required environmental analysis per Rhode Island Department of Environmental Management (RIDEM) Standards of any soil imported to the site, when not covered as a specific pay item in the Contract Documents and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Also included in this bid item is the analysis of excavated soils from the floodplain and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

1.2.2 Excavation

- a. Basis of Measurement: Per cubic yard excavated.
- b. Payment for excavation shall be measured and paid for at the Contract Unit Price calculated to the nearest cubic yard (CY) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for excavation of any material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

1.2.3 Grading of Excavated Soil

- a. Basis of Measurement: Per cubic yard graded.
- b. Basis of Payment: Payment for the grading of excavated contaminated soil (impacted native soil) shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the grading of any other material used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

1.2.4 Geotextile Fabric

- a. Basis of Measurement: Per square yard installed
- b. Basis of Payment: Payment for the installation of the geotextile material designated to construct the engineered cap shall be measured and paid for at the Contract Unit Price calculated to the nearest square yard (SY) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional geotextile material used onsite for constructing the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

1.2.5 Procure Imported Gravel

- a. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: Payment for the procurement of imported gravel shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for procurement and transportation or imported gravel to the site. Payment will not be made for gravel used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

1.2.6 Haul, Spread, and Compact Imported Gravel

- a. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: Payment for the hauling, spreading, and compaction of engineered cap gravel shall be measured and paid for at the Contract Unit Price calculated to the nearest CY up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, materials, spreading, mixing, rolling, compacting, grading, drying or adding water for desired compaction, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for gravel used for purposes other than those designated or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request. Any excavation necessary to achieve appropriate subgrade elevations for placement of this material shall be incidental to the placement of the imported gravel.

1.2.7 Procure Imported Topsoil

- a. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The placement of imported topsoil will be measured and paid for at the Contract Unit Price per cubic yard. Any excavation necessary to achieve appropriate subgrade elevations for placement of this material shall be incidental to the placement of the imported topsoil.

1.2.8 Haul and Spread Imported Topsoil

- b. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The placement of imported topsoil will be measured and paid for at the Contract Unit Price per cubic yard. Any excavation necessary to achieve appropriate subgrade elevations for placement of this material shall be incidental to the placement of the imported topsoil.

1.2.9 Furnish and Place Riprap

- a. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: The payment will be full compensation for the preparation of surfaces, loading, hauling, placing, and supplying, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. All materials will be measured in their installed position and their volume computed by the Method of Average End Area.

Compacting embankments and backfills by means of mechanical tampers, vibratory compactors or other approved equipment will not be measured but the cost will be incidental to riprap installation.

Replacement of material lost as a result of natural causes will be measured and paid for at the Contract unit price per cubic yard for Channel Excavation. Slides or breakages not attributable to the

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Contractor's negligence as determined by the Engineer will be measured and included in the final quantities.

1.2.10 Sluiceway Grading/Excavation

- a. Basis of Measurement: Per cubic yard graded/excavated
- b. Basis of Payment: The payment will be full compensation for all excavation and hauling, formation and compaction of embankments and backfill, disposing of excess and unsuitable materials, preparation and completion of subgrade, furnishing streambed material, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Earthwork bid item quantities are based on existing ground and proposed grading, as shown on the plans. Channel Excavation will be paid for at the Contract unit price per cubic yard. Quantities for payment of Excavation will be computed by the Method of Average End Areas, from the cross-sections of the original ground combined with cross-sections of the completed work.

1.2.11 Weir Stones

- a. Basis of Measurement: Per tons of stone installed.
- b. Basis of Payment: The payment will be full compensation for the preparation of surfaces, loading, hauling, placing, and supplying, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Weight slips will be provided with payment requests to document tonnage delivered to the site.

Preparation of surfaces and compacting embankments and backfills by means of mechanical tampers, vibratory compactors or other approved equipment will not be measured but the cost will be incidental to weir stone installation.

1.2.12 Geogrid

- a. Basis of Measurement: Per square yard installed.
- b. Basis of Payment: Payment for the installation of the geogrid material designated to construct the sluiceway engineered cap shall be measured and paid for at the Contract Unit Price calculated to the nearest square yard (SY) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional geotextile material used onsite for constructing the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

1.2.13 Sluiceway Crushed Stone Base Material

- a. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The placement of sluiceway crushed stone base material will be measured and paid for at the Contract unit price per cubic yard. Sluiceway

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

grading/excavation and/or removal of debris from the sluiceway necessary to achieve appropriate subgrade elevations for placement of this material shall be incidental to the placement of the sluiceway base material.

1.2.14 Coconut Fiber Erosion Control Matting

- a. Basis of Measurement: Per square yard installed.
- b. Basis of Payment: Payment for the installation of the coconut fiber erosion control matting designated to provide erosion control in the areas of plantings and the proposed bike path and shall be measured and paid for at the Contract Unit Price calculated to the nearest square yard (SY) up to the quantities designated on the Bid Form. Such payment will constitute full compensation for all labor, equipment, and all other items necessary and incidental to the performance of the work. Payment will not be made for the installation of any additional geotextile material used onsite for constructing the engineered cap or for quantities higher than the quantities designated on the Bid Form unless approved by a Change Request.

1.2.15 Crushed Stone Weir Base Material

- a. Basis of Measurement: Per cubic yard placed
- b. Basis of Payment: The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The placement of crushed stone weir base material will be measured and paid for at the Contract unit price per cubic yard. Sluiceway grading/excavation and/or removal of debris from the sluiceway necessary to achieve appropriate subgrade elevations for placement of this material shall be incidental to the placement of the sluiceway base material.

1.3 DEFINITIONS

1.3.1 Degree of Compaction

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557, for general soil types, abbreviated as percent laboratory maximum density.

1.4 SUBMITTALS

Preconstruction Submittals:

1. Construction Management Plan
2. Dewatering Plan
3. Source Letter and Gradation of Borrow Materials
4. Environmental Analysis of Borrow Materials (per 500 yd³)
5. Environmental analysis of excavated soils (per 500 yd³)

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

6. Specification sheets of geo-grid, geotextile, and coconut fiber erosion control matting.

1.5 DELIVERY, STORAGE AND HANDLING

The Contractor shall deliver, store, and handle material in a manner to prevent contamination or segregation of materials.

PART 2 - PRODUCTS

2.1 GEOGRID

Geogrid shall be Tensar® BX1200 or approved equal. Geogrid shall be installed in accordance with the Contract Drawings and specifications per manufactures' specification. Shop Drawings of geogrid shall be submitted to Engineer for approval in accordance with Section 01 33 00 - Submittals.

2.2 GEOTEXTILE FILTER FABRIC

Geotextile filter fabric shall be Contech® Woven Geotextile C200 or equivalent. Geotextile shall be installed per manufactures' specification and recommendations. Shop Drawings of shall be submitted to Engineer for approval.

Geotextile filter fabric shall meet the following requirements:

- tensile strength: 200 lbs
- burst strength: 400 psi
- puncture strength: 120 lbs
- permeability: 0.02 cm/sec
- elongation at failure: 30%
- minimum lap length: 24 in.

2.3 ENGINEERED BARRIER BACKFILL MATERIAL

2.3.1 Gravel (Imported Gravel)

Furnished Gravel shall be natural, friable surface soil uniform in color and texture and not supplied from the project site. Gravel analytical sampling and analytical results shall adhere to the RIDEM Remedial Approval Letter issued for this project.

Any clean fill that is to be used to cap the Site must be sampled **prior to delivery and placement**. All clean fill, including sub-grade material and loam, imported to the site must be sampled prior to delivery and placement. Please note that all samples are to be discrete, grab samples. Composite samples are not acceptable. Clean fill and loam must be sampled for arsenic at a frequency of one sample per 500 cubic yards. One-quarter of the total number of compliance samples of clean fill and loam will be sampled for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Priority Pollutant 13 (PP 13) Metals and Total Petroleum Hydrocarbons (TPH). **In the event that there is less than 500 cubic yards of fill/loam brought on site, a minimum of one sample should be analyzed for all analytes (i.e. PP 13 Metals, SVOCs, VOCs and TPH).** All soil that is to be utilized onsite must meet the Residential Direct Exposure Criteria (R-DEC) for all constituents or be certified to be non-jurisdictional by an environmental professional.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Laboratory analytical results shall be submitted to the Department via fax and written approval via email to use the material must be received by the Department prior to use. The Annual Inspection Report for the site, or Closure Report if applicable, should include either analytical sampling results from the fill demonstrating compliance or alternatively include written certification by an Environmental Professional attesting to the materials origin and suitability and that the fill is not jurisdictional.

Imported Gravel shall meet the following size requirements:

<u>% LESS THAN</u>	<u>U.S. STANDARD SIEVE SIZE</u>
100	2 1/2 in.
85 - 100	1 in.
60 - 100	1/2 in.
35 - 70	No. 10
20 - 50	No. 40
3 - 20	No. 200

2.3.2 Topsoil

Furnished Topsoil shall be natural, friable surface soil uniform in color and texture and not supplied from the project site. Topsoil analytical sampling and analytical results shall adhere to the RIDEM Remedial Approval Letter issued for this project.

Any clean fill that is to be used to cap the Site must be sampled **prior to delivery and placement**. All clean fill, including sub-grade material and loam, imported to the site must be sampled prior to delivery and placement. Please note that all samples are to be discrete, grab samples. Composite samples are not acceptable. Clean fill and loam must be sampled for arsenic at a frequency of one sample per 500 cubic yards. One-quarter of the total number of compliance samples of clean fill and loam will be sampled for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Priority Pollutant 13 (PP 13) Metals and Total Petroleum Hydrocarbons (TPH). **In the event that there is less than 500 cubic yards of fill/loam brought on site, a minimum of one sample should be analyzed for all analytes (i.e. PP 13 Metals, SVOCs, VOCs and TPH).** All soil that is to be utilized onsite must meet the Residential Direct Exposure Criteria (R-DEC) for all constituents or be certified to be non-jurisdictional by an environmental professional. Laboratory analytical results shall be submitted to the Department via fax and written approval via email to use the material must be received by the Department prior to use. The Annual Inspection Report for the site, or Closure Report if applicable, should include either analytical sampling results from the fill demonstrating compliance or alternatively include written certification by an Environmental Professional attesting to the materials origin and suitability and that the fill is not jurisdictional.

Topsoil shall be free from any parts of Johnson grass, Canada Thistle, Phragmites, Reed Canary Grass or any other noxious or invasive species. Topsoil shall have an organic content between 1.5 to 10.0 percent by weight when tested as specified in T 194. Furnished topsoil shall have a corrected pH value of not less than 6.0 and not more than 7.5. Organic compost material shall be incorporated into the Topsoil at a rate of 1:3 (25% organic material to 75% soil medium). Suitable organic compost material shall

LINCOLN LACE AND BRAID REMEDIATION PROJECT
 PROVIDENCE, RHODE ISLAND

include Leafro, Compro, or equivalent approved by the Engineer. No additional amendments or fertilizers of any kind shall be added to the Topsoil.

Imported Topsoil shall meet the following size requirements:

<u>MIN % PASSING</u>	<u>U.S. STANDARD SIEVE SIZE</u>
100	2 in.
90	No. 4
10	No. 10

Certified Clean Topsoil shall be analyzed for sand, silt and clay as specified in T 88. Textural analysis shall be as follows:

<u>% PASSING BY WEIGHT</u>	<u>SOIL PARTICLE SIZE (mm)</u>
20 - 70	Sand (2.0 - 0.050)
10 - 60	Silt (0.050 - 0.002)
5 - 30	Clay (less than 0.002)

2.4 RIPRAP SLOPE PROTECTION

2.4.1 Bedding Material

Bedding material shall consist of sand, gravel, or crushed rock, well graded, with a maximum particle size of 2 in. Material shall be composed of tough, durable particles. Fines passing the 75 micrometers No. 200 standard sieve shall have a plasticity index less than six.

2.4.2 Riprap

Rock fragments shall be sufficiently durable to ensure permanence in the structure and the environment in which it is to be used. Rock fragments shall be free from cracks, seams, and other defects that would increase the risk of deterioration from natural causes. The inclusion of more than trace 1 percent quantities of dirt, sand, clay, and rock fines will not be permitted.

All rip-rap shall be Class 1 and shall meet the following specifications:

<u>SIZE</u>	<u>% OF TOTAL WEIGHT SMALLER THAN GIVEN SIZE</u>
16"	90 - 100
12"	30 - 50
6"	0 - 10

The placement of rip-rap shall begin with the toe. The larger stones shall be placed in the toe and along the outside edges of the limits of the slope and channel protection. The rip-rap shall be placed with suitable equipment in such a manner as to produce a reasonable graded mass of stones with zero drop height. The placing of stones that cause excessive segregation is not allowed.

2.5 Coconut Fiber Erosion Control

Coconut Fiber Erosion Control Matting shall be North American Green C125® or approved equal. Coconut Fiber Erosion Control Matting shall be installed in accordance with the Contract Drawings and specifications and per manufactures' installation instructions. Shop Drawings and specifications of Coconut Fiber Erosion Control Matting shall be submitted to Engineer for approval in accordance with Section 01 33 00 - Submittals.

2.6 Weir Stones

Weir stones shall consist of stones with a flat, blocky, angular shape with at least one edge that can be used for the horizontal flow surface. Weir stones shall measure from 2-3 feet along the longest axis and 1-2 feet along the intermediate axis, as specified on Contract Drawings.

PART 3 - EXECUTION

3.1 SITE PREPARATION

Following concrete and asphalt demolition, debris removal, site clearing and stripping of potential organic soils and subsoil, most of the excavated soil is anticipated to generally consist of impacted native soils. The topsoil throughout the site is not reusable as engineered cap material. The excavated existing soils are to be utilized as subgrade material to be placed and graded prior to installation of the engineered cap in areas outside of the 100-year floodplain. Care should be taken to protect materials stockpiled for onsite reuse from moisture and other adverse conditions. Prior to the start of placement of subgrade materials, moisture density relationships should be performed on representative soil samples to allow for an evaluation for the reuse of the soil as a backfill (subgrade) material to establish compaction characteristics and associated moisture requirements.

3.1.1 Clearing and Grubbing

Unless indicated otherwise, remove trees, stumps, logs, shrubs, brush and vegetation and other items that would interfere with construction operations within the limits of work, as depicted on the Contract Drawings. Remove stumps entirely. Grub out matted roots and roots over 2 in. in diameter to at least 18 in. below existing surface. The trees to remain are indicated on the Contract Drawings.

3.2 EXCAVATION

The Contractor shall excavate all types of material encountered within the limits of the project to the lines, grades, and elevations indicated and contours and as specified. Grading shall be in accordance with the typical sections and contours shown on the Contract Drawings. Unsatisfactory materials encountered within the limits of the work below grade shall be excavated and replaced with satisfactory materials as directed. During construction, perform excavation and fill in a manner and sequence that will provide proper drainage at all times.

Excavation and grading conducted within the sluiceway will require dewatering techniques. To minimize dewatering requirements, the Contractor should consider a temporary excavation support system utilizing either interlocking

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

steel sheet piles or shoring, and portable dams, or portable cofferdams. Excavations and trenching should be performed in accordance with OSHA regulations.

3.2.1 Dewatering

Excavation and grading conducted within the sluiceway will require dewatering techniques. Measures should be taken to control water seepage, precipitation, infiltration, and surface water inflow within the excavation to minimize disturbance, maintain the integrity of soil bearing surfaces, and check dam, riprap, and stone base material installation to proceed in the dry. Ground surface grades in the vicinity of the excavation should be graded to promote positive drainage away from open excavations.

3.3 LABORATORY ANALYSIS OF IMPACTED NATIVE MATERIAL

Lincoln Lace and Braid is a site listed as a Brownfield site that requires the installation of an engineered cap to adhere to the RIDEM requirements. Excavated native material, prior to installation underneath the engineered cap, will have to be analyzed for lead, arsenic, and mercury in accordance with the RIDEM approved Soil Management Plan. Installation of the native soils prior to construction of the engineered cap will be permitted if the contaminants do not exceed the RIDEM upper concentration limits. The Contractor shall be responsible for performing all analytical testing, preparing and submitting all disposal request information (as required), supplying the Engineer all disposal documentation for this material, in accordance with all applicable rules and regulations governing the handling and disposal of the material.

3.4 GEOTEXTILE INSTALLATION

Geotextile fabric will be installed in accordance with manufacturer's recommendations upon review and approval by the Engineer.

3.5 GEOGRID INSTALLATION

Geogrid will be installed in accordance with manufacturer's recommendations upon review and approval by the Engineer.

3.6 COCONUT FIBER EROSION CONTROL MATTING

Erosion control matting shall be installed in areas of plantings and in the area of the proposed bike path. Erosion control matting shall be staked to ensure competency for one year and installed in accordance with manufacturer's installation instructions.

3.7 BACKFILLING

Imported gravel shall consist of an 8-in. thick gravel course underlain by geotextile. Excavated onsite soils may not be reused as engineered cap material. Placement layer shall be free of ice and snow, roots, stumps, rubbish and other deleterious materials and should consist of hard durable

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

sand and gravel. Backfill should be compacted to a minimum of 90% of the maximum dry density. The percent compaction is determined in the field by ASTM D-1556. Disturbed, frozen, excessively wet or loosened soils should be removed. Ground surface grades in the vicinity of the excavation should be graded as per Contract Drawings. Imported soil shall be analyzed in accordance with the Soil Management Plan and approved by the Engineer prior to deliver to the Site.

3.8 RIPRAP

Erosion control matting and the appropriate bedding material shall be installed where shown on the Contract Drawings prior to placing riprap.

Riprap stones shall be placed and distributed such that there will be no large accumulation of either the larger or smaller stone in any given area.

3.9 CRUSHED STONE WEIR BASE MATERIAL

Crushed stone weir base material shall be installed beneath each stone weir prior to installation. Crushed stone weir base material shall be installed as shown on the contract drawings.

3.10 ENGINEERED CAP INSTALLATION

The Contractor shall install the engineered cap as defined on the Contract Drawings. The Contractor shall incorporate the following installation sequencing and requirements for engineering cap installation:

3.10.1 Sluiceway

1. Initiate Dewatering Plan
2. Excavate/grade proposed check dam area
3. Install check dams
4. Install geogrid, geotextile, and sluiceway base material.

3.10.2 Within 100-year Floodplain

1. Demolish, crush, and remove existing concrete and asphalt within 100-year floodplain boundary
2. Excavate to required depth in accordance with Contract Drawings
3. Place 8-in. imported gravel layer over geotextile fabric
4. Place 4-in. imported topsoil layer over imported gravel layer
5. Install plantings and/or seed restored area in accordance with the planting plan provided on the Contract Drawings.

3.10.3 Outside the 100-year Floodplain

1. Prepare subgrade base for impacted native soil

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

2. Install material excavated from the 100-year floodplain in accordance with the Contract Drawings
3. Place 8-in. imported gravel layer over geotextile fabric.
4. Place 4-in. imported top soil layer over imported gravel layer.
5. Seed restored area in accordance with the planting plan provided in the Contract Drawings.

The Contractor shall notify the Owner's Engineer 24 hours in advance of initiating each phase of the engineered cap installation. The Engineer shall witness the cap installation and shall prepare a completion report documenting that the cap was installed in accordance to RIDEM Residential Standards, the Contract Drawings, and the specifications.

-- END OF SECTION --

SECTION 31 23 19
DEWATERING
(03/10)

PART 1 - GENERAL

1.1 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 -
Submittals:

Dewatering Plan

The Dewatering Plan and RIDEM permits shall define the procedures proposed for dewatering of area of proposed check dams. The procedures shall include a detailed description of the methods, material, and equipment to be used for each operation and the sequence of operations. The contractor shall submit a dewatering plan to the Engineer for review. Following review of the Engineer, the Contractor shall submit the Dewatering Plan to RIDEM for approval of Rhode Island Pollutant Discharge Elimination System (RIPDES) General Remediation Permit. The Contractor shall adhere to all approved permits and best management practices during dewatering.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

The Contractor shall provide all dewatering necessary to keep the construction and work areas dry. The Contractor shall design, install, operate, and maintain an adequate system. The system shall be of sufficient size and capacity to maintain a dry condition without delays to construction operations.

2.2 COFFERDAMS

Cofferdams shall be designed by a Professional Engineer registered in Rhode Island using accepted and professional methods of design and engineering consistent with the best modern practice. The cofferdam design shall be identified as part of the dewatering plan.

PART 3 - EXECUTION

3.1 DEWATERING PROCEDURE

A temporary cofferdam structure with pumps shall be provided to allow excavation and grading in the sluiceway and construction of the check dams. The cofferdam shall be designed and constructed in accordance with approved materials and procedures. When no longer needed for water control, all dewatering facilities shall be removed as the Contractor's property.

3.1.1 Maintenance of Water Quality

The area behind the cofferdam shall be pumped out in a manner that will minimize impacts on water quality and siltation into the Woonasquatucket River.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Any water that is pumped and discharged from the excavation as part of the Contractor's water handling shall be filtered by approved method prior to its discharge into receiving water or drainage system. The approved method at a minimum shall include the use of two fractionalization tanks to settle out sediment, and appropriately-sized silt filter bags as shown on the Contract Drawings. All sediment collected in the bottom of the tanks shall be appropriately sampled and disposed of in an approved landfill.

Under no circumstances shall the Contractor discharge water directly to the area designated as wetlands. The Contractor shall discharge water from dewatering operations directly to the Woonasquatucket River after filtering by an approved method.

3.2 COFFERDAMS

Cofferdams shall have a minimum crest elevation to prevent flooding of the work area. All dimensions and elevations shall be verified by the Contractor. The Contractor is responsible for determining the cofferdam heights required to prevent flooding of the construction.

The cofferdam shall be constructed in accordance with approved construction methods and procedures. The Engineer reserves the right to conduct inspections as required to verify compliance. When work in the area is substantially complete, the cofferdams shall be removed.

Earth and rock materials and all other materials, including synthetic materials, sheet piling and structural steel, remain the property of the Contractor and shall be disposed of offsite.

-- END OF SECTION --

SECTION 31 25 00
SOIL SURFACE EROSION CONTROL
(03/10)

PART 1 - GENERAL

1.1 SCOPE

Work included in this Section consists of furnishing and placing temporary erosion and pollution control devices, specified herein, and/or shown on the Contract Drawings, and as needed for a complete and proper installation. All erosion control work is to be done in conformance with all federal, state and local permits and regulations.

PART 2 - PRODUCTS

2.1 EROSION CONTROLS

Filtrexx SiltSoxx™ or approved equal erosion control device(s) are to be installed down slope of any disturbed area requiring erosion and sediment control as indicated on the Contract Drawings. SiltSoxx™ used for perimeter control of sediment and soluble pollutants in storm runoff shall be 12 inch diameter and meet Filtrexx SiltSoxx™ Material Specifications and use Certified Filtrexx FilterMedia™.

2.2 CRUSHED STONE

Crushed stone for the stabilized construction entrance shall be ASTM C-33, Size No. 2 or 3.

PART 3 - EXECUTION

3.1 EROSION CONTROLS

Erosion Control contractor is required to be a Filtrexx Certified' Installer as determined by Filtrexx International, LLC (440-926-2607 or visit website at Filtrexx.com). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (current listing can be found at www.filtrexx.com).

SiltSoxx™ will be placed at locations indicated on plans as directed by the Engineer.

SiltSoxx™ should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e. 2:1 slopes), a second SiltSoxx™ shall be constructed at the top of the slope.

Stakes shall be installed through the middle of the SiltSoxx™ on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes. In the event staking is not possible, i.e. when SiltSoxx™ are used on pavement, heavy concrete blocks shall be used behind the SiltSoxx™ to help stabilize during rainfall/runoff events.

Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Loose compost may be backfilled along the upslope side of the SiltSoxx™, filling the seam between the soil surface and the device, improving filtration and sediment retention.

Filtrex SiltSoxx™ are not to be used in perennial, ephemeral, or intermittent streams.

INSPECTION

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. SiltSoxx™ should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional SiltSoxx™ may be required to reduce effective slope length or sediment removal may be necessary. SiltSoxx™ shall be inspected until area above has been permanently stabilized and construction activity has ceased

MAINTENANCE

The Contractor shall maintain the SiltSoxx™ in a functional condition at all times and it shall be routinely inspected.

If the SiltSoxx™ has been damaged, it shall be repaired, or replaced if beyond repair.

The Contractor shall remove sediment at the base of the upslope side of the SiltSoxx™ when accumulation has reached 1/2 of the effective height of the SiltSoxx™, or as directed by the Engineer. Alternatively, a new SiltSoxx™ can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.

SiltSoxx™ shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.

The FilterMedia™ will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.

DISPOSAL/RECYCLING

Filtrex FilterMedia™ is a composted organic product recycled and manufactured from locally generated organic, natural, and biologically based materials. Once all soil has been stabilized and construction activity has been completed, the FilterMedia™ may be dispersed with a loader, rake, bulldozer or similar device and may be incorporated into the soil as an amendment or left on the soil surface to aid in permanent seeding or landscaping. Leaving the FilterMedia™ on site reduces removal and disposal costs compared to other sediment control devices. The mesh netting material will be extracted from the FilterMedia™ and disposed of properly by the Contractor. The photodegradable mesh netting material (FilterSoxx™) will degrade in 2 to 5 years if left on site. Biodegradable mesh netting material is available and does not need to be extracted and disposed of, as it will completely decompose in approximately 6 to 12 months. Using biodegradable SiltSoxx™ completely eliminates the need and cost of removal and disposal.

3.2 STABILIZED CONSTRUCTION ENTRANCE

A stabilized construction entrance shall be installed at the location indicated on the Contract Drawings. The stabilized entrance shall be at least 10 ft wide extending at least 50 ft from the roadway. Each side of the stabilized entrance will have a 25 ft radius curvature from the roadway to the entrance.

-- END OF SECTION -

SECTION 32 92 19
SEEDING
(03/10)

PART 1 - GENERAL

1.1 SCOPE

This work shall consist of seeding for all areas designated to receive specialized seeding as specified in the Contract Drawings. Prior to the planting of any stock, the Contractor shall have previously added 4 in. of topsoil to the entire planting area. Permanent Seeding shall be performed from April 1 to May 31 or from August 1 to September 10. Dormant seeding may be completed from November 1 to December 15.

1.2 RELATED WORK

The following section provides specifications for mulching that is required with all seeding:

Section 31 25 00 - Soil Surface Erosion Control

PART 2 - PRODUCTS

2.1 WATER

Water used in the planting, establishing, or caring for vegetation shall be free from any substance that is injurious to plant life.

2.2 SEED

For all disturbed upland areas of the site that require permanent seeding, including the staging and stockpile and site access area and other disturbed ground not within the wetland planting areas, the permanent upland seeding shall consist of the below seed mix:

Botanical Name	Common Name	Form	% of Mix / Rate
<i>Festuca rubra</i>	Red Fescue	Seed	32.3%/10.0 lbs/ac
<i>Poa compressa</i>	Canada bluegrass	Seed	32.3%/10.0 lbs/ac
<i>Lolium perenne</i>	Perennial ryegrass	Seed	32.3%/10.0 lbs/ac
<i>Agrostis alba</i>	Red top	Seed	3.3%/1.0 lbs/ac

PART 3 - EXECUTION

3.1 SEEDING

Permanent upland seeding to be applied at a rate of 31 lbs/ac.

Equipment shall consist of hydroseeders approved by the Engineer for applying materials either in a wet form. All equipment shall be calibrated before application to the satisfaction of the Engineer so that materials are applied accurately and evenly to avoid misses and overlaps.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Hydroseeders shall display maximum capacity in gallons (liters) and be equipped with an agitation system capable of keeping all the solids in a state of suspension. The mixture shall be directed upward into the air so droplets will fall in a uniform spray to avoid erosion or runoff. Hydroseeders shall not be used during periods of high winds or rain.

No fertilizer of any kind shall be added during the seeding operation.

Mulch shall be placed on the seeded areas within 48 hours after seeding.

-- END OF SECTION --

SECTION 32 93 43
PLANTINGS
(03/10)

PART 1 - GENERAL

1.1 SCOPE

This section covers specifications regarding acquisition and handling of plantings, placement and installation, post-planting maintenance, and performance criteria.

As soon as practical following final grading of areas designated to receive plantings, the Contractor shall furnish, place and install containerized plantings and shrubs of acceptable type and quality depicted in this section and in the appropriate locations as shown in the Contract Drawings.

The Contractor shall be responsible for furnishing, installation, establishment, protection, and maintenance of plantings and shrubs until complete site demobilization. The Contractor shall be responsible for the in-kind replacement of any and all installed plantings that does not successfully establish during the specified warranty.

1.2 UNIT PRICE - BASIS OF MEASUREMENT

Furnish and Plant Plantings

1. Basis of Measurement: Per planting planted.
2. Basis of Payment: The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Plantings will be measured and paid for at the lump sum price per planting planted.

PART 2 - PRODUCTS

2.1 PLANTINGS

All plantings shall be of the type, size, and quantity depicted on the Contract Drawings.

Requests for substitutions shall be submitted by the Contractor in writing to the Engineer for approval. All plantings shall derive of stock native to the Northeast United States, east of Ohio and north of 39.5 degrees north latitude; local ecotypes are preferred.

Plantings shall be protected during shipment and delivery to prevent desiccation or excessive damage to the branches or leaves. At a minimum, the following guidelines for shipping containers shall be met:

Container-grown plantings and shrubs shall be delivered in containers sufficiently rigid to hold root ball shape and protect plantings and shrubs from damage during shipping.

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

Containerized plantings and shrubs shall be identified with durable waterproof, u-v stabilized labels, and weather-resistant ink stating the correct plant name and size.

Plant material and other products shall be inspected by the Engineer upon arrival at the jobsite for conformance with the Contract documents. Any unacceptable materials shall immediately be removed by the Contractor from the jobsite and replaced at no additional cost to the Owner. The following guidelines shall be used by the Engineer to evaluate the quality of plant material received from the nursery supplier:

Containerized plantings and shrubs shall be vigorous, healthy plants having healthy and branched root systems. If in leaf, plants shall be free from disease with no leaf damage, chlorosis, or wilting and no insect damage, sun-scald injury, or broken stems or branches. If dormant, stems shall be pliable and exhibit healthy cambium. Plants with brittle stems, unhealthy cambium or broken branches will not be accepted.

Plantings not installed on the day of arrival at the site shall be stored in appropriate designated areas as directed by the Engineer. Plantings and shrubs shall be kept moist by the Contractor and shall be protected from exposure to wind and shall be shaded from the sun.

Plantings and shrubs shall be furnished in sizes indicated; larger sizes than specified are generally acceptable.

2.2 FERTILIZER

Fertilizer shall be commercial grade tablet or granular release (8 to 14 month) variety such as Osmocote 18-5-11, Agriform 20-10-5, or approved equal. Fertilizer shall be provided by the Contractor and application methods and rates determined based on laboratory analysis of soils provided by the contractor.

Plant material shall be provided by a nursery which procures and/or produces native material specifically for restoration or construction projects.

PART 3 - EXECUTION

3.1 PLANT PLACEMENT

Planting materials shall be placed by the Contractor in the appropriate planting zones and at the densities specified and depicted on the Contract Drawings, or as directed by the Engineer. Plantings shall be installed within 7 days of achieving final grade in any area unless otherwise approved by the Engineer.

3.2 PLANT INSTALLATION

Plantings shall be installed by qualified professionals provided by the Contractor. All areas to be planted shall be free from weeds. Removal of weed growth shall be by approved methods which do not rut or scar the surface, or cause disruption of the slope line or grade.

3.3 PLANT SEASON

The calendar dates for installation of planting and shrub material shall be:

LINCOLN LACE AND BRAID REMEDIATION PROJECT
PROVIDENCE, RHODE ISLAND

March 1 to June 15
August 15 to September 30

Plant installation at other times may be done only when approved by the Engineer.

3.4 PLANTING METHODS

Containerized plants shall be installed by the Contractor in the locations depicted in the Drawing. Care shall be taken to avoid damage to stems, branches, bark, and root balls during installation. Any plant material damaged during installation shall be replaced at the contractor's expense.

Fertilizer shall be initially applied at a rate determined from analysis of the native soil.

3.5 ESTABLISHMENT, PROTECTION, AND MAINTENANCE

The Contractor shall be responsible for the establishment, protection, and maintenance of plantings. Until complete site demobilization, the Contractor shall regularly water the plantings and shrubs and protect the planted areas from damage due to foot traffic, vehicles, animals, or erosion (both wind and water). Additional silt fencing may need to be installed to protect restoration areas from run-off originating from topographically higher areas. Until complete site demobilization, the Contractor shall also remove weeds and debris on a bi-weekly basis.

-- END OF SECTION --

APPENDIX B

Environmental Land Usage Restriction and Soil Management Plan

ENVIRONMENTAL LAND USAGE RESTRICTION

This Declaration of Environmental Land Usage Restriction (.Restriction.) is made on this _____ day of _____, 20__ by the City of Providence, and its successors and/or assigns (hereinafter. the "Grantor").

WITNESSETH:

WHEREAS. the Grantor, The City of Providence, is the owner in fee simple of certain real property identified as Plat 113. Lots 305 and 429 Rhode Island (the "Property"), more particularly described in Exhibit A (Legal Description) which is attached hereto and made a part hereof;

WHEREAS. the Property (or portion thereof identified in the Class I survey which is attached hereto as Exhibit 2A and is made a part hereof) has been determined to contain soil and/or groundwater which is contaminated with certain hazardous materials and petroleum in excess of applicable residential direct exposure criteria pursuant to the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases ("Remediation Regulations");

WHEREAS. the Grantor has determined that the environmental land use restrictions set forth below are consistent with the regulations adopted by the Rhode Island Department of Environmental Management ("Department") pursuant to R.I.G.L. § 23-19.14-1 et seq.;

WHEREAS. the Department's written approval of this Restriction is contained in the document entitled: Remedial Approval Letter issued pursuant to the Remediation Regulations;

WHEREAS. to prevent exposure to or migration of hazardous materials and petroleum and to abate hazards to human health and/or the environment. and in accordance with the Remedial Approval Letter. the Grantor desires to impose certain restrictions upon the use, occupancy, and activities of and at the Property;

WHEREAS. the Grantor believes that this Restriction will effectively protect public health and the environment from such contamination; and

WHEREAS. the Grantor intends that such restrictions shall run with the land and be binding upon and enforceable against the Grantor and the Grantor's successors and assigns.

NOW, THEREFORE, Grantor agrees as follows:

A. Restrictions Applicable to the Property: In accordance with the Remedial Approval Letter, the use, occupancy and activity of and at the Property is restricted as follows:

- i No residential use of the Property shall be permitted that is contrary to Department approvals and restrictions contained herein;
- ii No soil at the Property shall be disturbed in any manner without written permission of the Department's Office of Waste Management, except as permitted in the Soil Management Plan (SMP) approved by the Department in a written approval letter dated _____ (date) Exhibit B and attached hereto;
- iii Humans engaged in activities at the Property shall not be exposed to soils containing hazardous materials or petroleum in concentrations exceeding the applicable Department approved direct exposure criteria set forth in the Remediation Regulations;
- iv The engineered controls at the Property described in the SMP contained in Exhibit B attached hereto shall not be disturbed and shall be properly maintained to prevent humans engaged in recreational activity from being exposed to soils containing hazardous materials and/or petroleum in concentrations exceeding the applicable Department-approved residential direct exposure criteria in accordance with the Remediation Regulations]; and

B. No action shall be taken, allowed, suffered, or omitted at the Property if such action or omission is reasonably likely to:

- i Create a risk of migration of hazardous materials and/or petroleum;
- ii Create a potential hazard to human health or the environment; or
- iii Result in the disturbance of any engineered controls utilized at the Property, except as permitted in the Department-approved SMP contained in Exhibit B.

C. Emergencies: In the event of any emergency which presents a significant risk to human health or to the environment, including but not limited to, maintenance and repair of utility lines or a response to emergencies such as fire or flood, the application of Paragraphs A (iii.-viii.) and B above may be suspended, provided such risk cannot be abated without suspending such Paragraphs and the Grantor complies with the following:

- i Grantor shall notify the Department's Office of Waste Management in writing of the emergency as soon as possible but no more than three (3) business days after Grantor's having learned of the emergency. (This does not remove Grantor's obligation to notify any other necessary state, local or federal agencies.);

- ii Grantor shall limit both the extent and duration of the suspension to the minimum period reasonable and necessary to adequately respond to the emergency;
- iii Grantor shall implement reasonable measures necessary to prevent actual, potential, present and future risk to human health and the environment resulting from such suspension;
- iv Grantor shall communicate at the time of written notification to the Department its intention to conduct the emergency response actions and provide a schedule to complete the emergency response actions;
- v Grantor shall continue to implement the emergency response actions, on the schedule submitted to the Department, to ensure that the Property is remediated in accordance with the Remediation Regulations (or applicable variance) or restored to its condition prior to such emergency. Based upon information submitted to the Department at the time the ELUR was recorded pertaining to known environmental conditions at the Property, emergency maintenance and repair of utility lines shall only require restoration of the Property to its condition prior to the maintenance and repair of the utility lines: and
- vi Grantor shall submit to the Department, within ten (10) days after the completion of the emergency response action, a status report describing the emergency activities that have been completed.

D. Release of Restriction; Alterations of Subject Area: The Grantor shall not make, or allow or suffer to be made, any alteration of any kind in, to, or about any portion of the Property inconsistent with this Restriction unless the Grantor has received the Department's prior written approval for such alteration. If the Department determines that the proposed alteration is significant, the Department may require the amendment of this Restriction. Alterations deemed insignificant by the Department will be approved via a letter from the Department. The Department shall not approve any such alteration and shall not release the Property from the provisions of this Restriction unless the Grantor demonstrates to the Department's satisfaction that Grantor has managed the Property in accordance with applicable regulations.

E. Notice of Lessees and Other Holders of Interests in the Property: The Grantor, or any future holder of any interest in the Property, shall cause any lease, grant, or other transfer of any interest in the Property to include a provision expressly requiring the lessee, grantee, or transferee to comply with this Restriction. The failure to include such provision shall not affect the validity or applicability of this Restriction to the Property.

F. Enforceability: If any court of competent jurisdiction determines that any provision of this Restriction is invalid or unenforceable, the Grantor shall notify the Department in writing within fourteen (14) days of such determination.

G. Binding Effect: All of the terms, covenants, and conditions of this Restriction shall run with the land and shall be binding on the Grantor, its successors and assigns, and each owner and any other party entitled to control, possession or use of the Property during such period of ownership or possession.

H. Inspection & Non-Compliance: It shall be the obligation of the Grantor, or any future holder of any interest in the Property, to provide for annual inspections of the Property for compliance with the ELUR in accordance with Department requirements.

An officer or director of the City with direct knowledge of past and present conditions of the Property (the "City Representative"), or a qualified environmental professional will, on behalf of the Grantor or future holder of any interest in the Property, evaluate the compliance status of the Property on an annual basis. Upon completion of the evaluation, the City Representative or environmental professional will prepare and simultaneously submit to the Department and to the Grantor or future holder of any interest in the Property an evaluation report detailing the findings of the inspection, and noting any compliance violations at the Property. If the Property is determined to be out of compliance with the terms of the ELUR, the Grantor or future holder of any interest in the Property shall submit a corrective action plan in writing to the Department within ten (10) days of receipt of the evaluation report, indicating the plans to bring the Property into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

A qualified representative of the City will conduct quarterly inspections of the existing trees at the Site to determine if the trees are dying. If a tree is determined to be dying by the qualified professional the tree shall be removed to minimize damage to the engineered cap. The City will notify the Department a minimum of two (2) days prior to initiation of the work. The engineered cap will be repaired to ensure a minimum of one foot of vegetated, certified clean fill underlain with a geotextile of equal or greater quality than the one specified is installed.

In the event of any violation of the terms of this Restriction, which remains uncured more than ninety (90) days after written notice of violation, all Department approvals and agreements relating to the Property may be voided at the sole discretion of the Department.

I. Terms Used Herein: The definitions of terms used herein shall be the same as the definitions contained in Section 3 (DEFINITIONS) of the Remediation Regulations.

IN WITNESS WHEREOF, the Grantor has hereunto set (his/her) hand and seal on the day and year set forth above.

City of Providence

By: _____
Grantor (signature)

Grantor (typed name)

STATE OF RHODE ISLAND

COUNTY OF PROVIDENCE

In Providence, in said County and State, on the ____ day of _____, 20__.
before me personally appeared _____, to me known and known by me to be the
party executing the foregoing instrument and he acknowledged said instrument by him executed
to be his free act and deed.

Notary Public: _____

My Comm. Expires: _____

APPENDIX C

Safety, Health, and Emergency Response Plan



**Soil Management Plan
Lincoln Lace & Braid Remediation Project
55-61 Ponagansett Street
Providence, Rhode Island**

Prepared for

Providence Parks Department
Dalrymple Boathouse – Roger Williams Park
Providence, Rhode Island 02905

Prepared by

EA Engineering, Science, and Technology
2350 Post Road
Warwick, Rhode Island 02886
(401) 736-3440

April 2010
REVISED
EA Project No.: 61891.05

CONTENTS

	<u>Page</u>
B.1 PURPOSE	B-1
B.2 GOAL	B-1
B.3 SITE DESCRIPTION AND BACKGROUND	B-1
B.4 ENGINEERED CAP	B-2
B.5 FUTURE DEVELOPMENT	B-3
B.6 DOCUMENTATION	B-6
B.7 HEALTH AND SAFETY	B-6

SOIL MANAGEMENT PLAN

B.1 PURPOSE

The purpose of this Soil Management Plan (SMP) is to develop a strategy for managing the contaminated soil encountered during potential future construction activities at the Lincoln Lace & Braid site at 55-61 Ponagansett Street (Plat 113, Lots 305 and 429) in Providence, Rhode Island. It is important that all personnel responsible for working with soil on the site, including equipment operators, are familiar with this SMP.

B.2 GOAL

The goal of this SMP is to ensure that soil excavated, temporarily stockpiled, graded, or moved during and after construction activities is managed properly and handled in a safe manner. All contaminated soil at the site has been capped beneath the geosynthetic fabric layer and 4 to 12 in. of certified clean soil.

This SMP is included as an attachment to the final Environmental Land Usage Restriction (ELUR) for the site. Future intrusive activities conducted at the site will be subject to the procedures contained in this SMP.

B.3 SITE DESCRIPTION AND BACKGROUND

The Lincoln Lace & Braid site was established in 1812 as Merino Mill. By 1870, there were mill villages on the Johnston and North Providence sides of the river at Olneyville, Dyerville, Manton Village, Lyman's Mill, Allendale, Centerdale, and Graniteville. Within Providence, mills included Union Cotton, Delaine, Lyman Manufacturing, and the Valley Bleachery. By that time, nearly every foot of the river's drop was being used to turn a factory waterwheel. In order to keep the mill wheels turning throughout the year, the local manufacturers formed a company to build reservoirs upstream to store water for use during the dry months, such as the reservoir formerly located on the abutting site, the Ponagansett Avenue Landfill.

In 1994, the main building of the mill complex was destroyed by fire. Subsequent remediation efforts have removed the building debris as well as petroleum and petroleum-contaminated soil from the site. Only portions of the ruins of the former Merino Mill and its associated waterpower infrastructure are currently visible.

The primary contaminants of concern (COC) at the site include volatile organic compounds (VOCs), metals, and polycyclic aromatic hydrocarbons (PAHs) at concentrations exceeding the Rhode Island Department of Environmental Management (RIDEM) Residential Direct Exposure Criteria (RDEC) for soil. Exceedances of the RDEC for arsenic, lead, and total petroleum hydrocarbons (TPH) were found in some sediment samples.

B.4. ENGINEERED CAP

The designed engineered cap components at the site consist of the following layers:

- Closure cap subgrade
- Geosynthetic fabric filter layer
- Protective cover soil
- Vegetative cover
- Site improvements.

A closure cap subgrade has been prepared from the existing site grade that will create adequate stormwater drainage for the site and serve as a suitable base for the components of the closure cap system.

A geosynthetic fabric filter layer (with a puncture strength of 120 lbs and a burst strength of 400 psi) has been placed above the closure cap subgrade and below a one ft protective soil cover for all landscaped areas of the Site to prevent human exposure to impacted soil. The fabric filter has been installed so that the seams overlap to prevent the underlying impacted soil from mixing with the clean soil.

The protective cover soil layer of the closure cap system, also commonly termed the vegetative support soil layer, consists of 1 ft of certified clean fill material across the site. This layer is designed to provide for root growth while buffering the underlying layers from damage due to the effects of frost penetration, root penetration, and loading of the finished surface of the landfill closure cap. The upper 4 in. of this soil layer is an organic topsoil having characteristics to promote adequate vegetation, stability, and erosion resistance in the landscaped areas of the site.

The vegetative cover component is a locally adapted perennial plant mix that is suitable for the Rhode Island area climate. The species will be capable of surviving in a low nutrient soil, with little or no requirements for nutrient addition. Root penetration into the soil should be less than the minimum thickness of the soil cover layer so as not to affect the drainage media or geosynthetic material beneath.

The sluiceway has been remediated through the installation of an engineered barrier in the upstream portion of the water body. The contaminated sediment has been capped with a geogrid (to provide stability), a geotextile (to prevent migration of contaminated sediment), and 6 in. of crushed stone (to prevent direct exposure and stabilize the geotextile). Check dams have been installed in the downstream portion of the sluiceway to aerate and remove iron from the surface water prior to discharge into the Woonasquatucket River.

In the vicinity of the tailrace on the southern portion of the site, remedial activities include the removal of existing debris, as possible; the removal of invasive plant species in and along the tailrace; and the introduction of native wetland plant species. A wetland buffer along the northern edge of the tailrace will be established to allow plants to thrive and minimize potential

impacts from the site-wide cap construction. A buffer will also be established along the Woonasquatucket River between the river and the proposed bike path.

B.5 FUTURE DEVELOPMENT

In accordance with Section A(iii) of the ELUR, no soil at the property is to be disturbed in any manner without prior written permission of RIDEM's Office of Waste Management, except for minor inspections, maintenance, and landscaping activities that do not disturb the contaminated soil at the site. The integrity of the existing engineered cap will be maintained during all future operations on the Site. Operations that require the temporary removal or alteration of the cap may be permissible subject to RIDEM approval of a work plan. This work plan must include a description of the anticipated site activity, including the volume of soil to be excavated, anticipated contaminants of concern, a site figure identifying the proposed area to be excavated or disturbed, the expected duration of the project, and the proposed disposal location for excavated soil. This work plan must be submitted to RIDEM no later than 60 days prior to the proposed initiation of these activities. RIDEM will determine if the submittal of a Closure Report for these activities will be required, as well as if Public Notice is required prior to the initiation of soil disturbance. RIDEM will be subsequently notified, following the approval of the work plan, at least 2 days prior to the initiation of soil disturbance activities. Work associated with the Notification will not commence until written RIDEM approval has been issued. If these operations are performed in areas where the existing cap exists, the cap must be replaced within 14 days unless otherwise approved. Shall any significant alterations to the RIDEM-approved plan be necessary, a written description of the proposed deviation will be submitted to RIDEM for review and approval prior to initiating such changes.

Any operations that may require contact with capped, impacted soil, such as utility trenching, must follow the same procedures listed above, including those detailed in the Safety, Health, and Emergency Response Plan (SHERP). If the cap is disturbed, it must be replaced with the appropriate layer of clean fill, asphalt, concrete, and/or geotextile fabric within 14 days unless otherwise approved. Any impacted soil below the cap must be handled properly, and the use of Level D personnel protective equipment (PPE) would be required.

Applicable Area

This SMP and affiliated ELUR, which restricts the property from **Residential** use, pertains to the **area detailed in Exhibit A of the ELUR**. See attached site figure.

Soil Management

The risk of direct exposure of humans to contaminated soil and sediment is the primary concern at the Site. Individuals engaged in activities at the Site may be exposed through incidental ingestion, dermal contact, or inhalation of vapors or entrained soil particles if proper precautions are not taken. Therefore, the following procedures will be followed to minimize the potential of exposure.

The appropriate precautions will be taken to restrict unauthorized access to the property during site work. Dust suppression (i.e. watering) techniques must be employed at all times. Air monitoring and a means to control odors will be utilized, as appropriate (odor-suppressing foam, etc.) if odors become a nuisance. Best management practices also include the managing and minimizing of the migration and/or surface runoff of hazardous materials at the site during remedial and/or future site surface disturbances. This should be achieved via the installation of hay bales, silt fencing, and any other appropriate measures during the entire duration of site/earth work.

Activities that encounter unexpected observation or situation arises during site work will immediately cease. Workers will not attempt to handle the situation themselves but will contact the appropriate authority for further direction.

All soils are presumed to be regulated until such time that it is demonstrated to RIDEM, through sampling and laboratory analysis, that they are not regulated (i.e., presumptive remedies or locations of previously-inaccessible soil).

Excess soil is to remain onsite for analytical testing, to be performed by an Environmental Professional, in order to determine the appropriate disposal and/or management options. The soil must be placed on and covered with polyethylene/plastic sheeting during the entire duration of its staging and secured with appropriate controls to limit the loss of the cover and protect against stormwater and/or wind erosion (i.e. hay bales, silt fencing, rocks).

Excavated soils will be staged and temporarily stored in a designated area of the property. Within reason, the storage location will be selected to limit unauthorized access to the materials (i.e., away from public roadways/walkways). No regulated soil will be stockpiled onsite for greater than 60 days without prior RIDEM approval.

Native soils excavated from the Site that will be used as subgrade beneath the engineered cap shall be observed via visual and olfactory observation during excavation and screened using a photo-ionization detector and at a frequency of one sample every 500 cubic yards. These soils shall be sampled and analyzed at a Rhode Island Certified Laboratory for arsenic, lead, and mercury at a frequency of one sample every 500 cubic yards.

A proper leakproof container (i.e. drum or lined roll-off) or secondary containment will be utilized if stockpiled soils pose a risk or threat of leaching hazardous materials.

Soils excavated from the site may not be reused as fill on residential property. Excavated fill material shall not be reused as fill on commercial or industrial properties unless it meets RIDEM's Method 1 RDEC for all constituents listed in Table 1 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations). Soil must be sampled and analyzed by a qualified Environmental Professional at a frequency of one sample per 500 tons for all constituents. Copies of the laboratory analysis results shall be maintained by the site owner and included in the annual inspection report for the site, or the closure report if applicable. In the event that the soil does not meet any of these criteria, the material must be properly managed and disposed of offsite at a licensed facility.

Site soils that are to be disposed of offsite must be done so at a licensed facility in accordance with all local, state, and federal laws. Copies of the material shipping records associated with the disposal of the material shall be maintained by the site owner and included in the annual inspection report for the site.

Best soil management practices should be employed at all times, and regulated soils should be segregated into separate piles (or cells or containers) as appropriate based upon the results of analytical testing when multiple reuse options are planned (i.e. reuse onsite, reuse at a RIDEM-approved industrial/commercial property, or disposal at a RIDEM- approved licensed facility).

All non-disposable equipment used during the soil disturbance activities will be properly decontaminated as appropriate prior to removal from the site. All disposable equipment used during the soil disturbance activities will be properly containerized and disposed of following completion of the work. All vehicles utilized during the work shall be properly decontaminated as appropriate prior to leaving the site.

At the completion of site work, all exposed soils are required to be recapped with RIDEM-approved engineered controls (2 ft of clean fill or equivalent: building foundations, 4 in. of pavement/concrete underlain with 6 in. of clean fill and/or 1 ft of clean fill underlain with a geotextile liner) consistent or better than the site surface conditions prior to the work that took place. These measures must also be consistent with the RIDEM- approved ELUR recorded on the property.

Any clean fill that is to be used to cap the site must be sampled **prior to delivery and placement**. All clean fill imported to the site, including subgrade material and loam, must be sampled prior to delivery and placement. Please note that all samples are to be discrete, grab samples; composite samples are not acceptable. Clean fill and loam must be sampled for arsenic at a frequency of one sample per 500 cubic yards (yd³). One-quarter of the total number of compliance samples of clean fill and loam will be sampled for VOCs, semi-volatile organic compounds (SVOCs), priority pollutant 13 (PP 13) metals, and TPH. **A minimum of one sample should be analyzed for all analytes (i.e. PP 13 metals, SVOCs, VOCs, and TPH) if less than 500 yd³ of fill/loam brought onsite.** All soil that is to be utilized onsite must meet the RDEC for all constituents or be certified to be non-jurisdictional by an Environmental Professional. Laboratory analytical results shall be submitted to RIDEM via fax, and written approval via email to use the material must be received by RIDEM *prior* to use. The Annual

Inspection Report for the site, or Closure Report if applicable, should include either analytical sampling results from the fill demonstrating compliance or, alternatively, include written certification by an Environmental Professional attesting to the material's origin and suitability and that the fill is not jurisdictional.

B.6 DOCUMENTATION

Reports of the annual cap inspections will be submitted to RIDEM as specified in the ELUR.

B.7 HEALTH AND SAFETY

Direct contact with contaminated material during construction activities will be minimized with the use of Level D PPE including gloves, boots, long-sleeved shirts, and safety glasses. Workers are also required to wash their hands with soap and water prior to eating, drinking, smoking, or leaving the site. Strict dust control measures will also be kept in place to prevent the contaminated soil from becoming airborne. Refer to the Remedial Action Work Plan Addendum, Section 3, for the site-specific contingency plan.

CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
1.1 Purpose.....	1
1.2 Background.....	1
1.2.1 Site Description.....	1
1.2.2 Remedial Action Scope.....	2
1.2.3 Chemicals of Concern.....	2
1.3 Safety, Health, and Emergency Response Plan Organization	3
2. PROJECT MANAGEMENT.....	4
2.1 Key Personnel	4
2.2 Responsibilities	4
2.2.1 Program Manager.....	4
2.2.2 Project Manager	5
2.2.3 Program Safety and Health Officer (or Designee).....	5
2.2.4 Site Safety and Health Officer/Emergency Coordinator	5
2.2.5 Field Manager	5
2.2.6 EA Employee Responsibilities	5
2.2.7 Subcontractors.....	6
3. HAZARD COMMUNICATION AND ENVIRONMENTAL MONITORING DURING FIELD OPERATIONS.....	7
3.1 Hazard Communication	7
3.2 Chemical Hazards	7
3.2.1 Areas of Concern - Chemical Hazards.....	7
3.2.2 Chemicals for Equipment Calibrations and Operations.....	7
3.3 Physical Hazards.....	8
3.3.1 Fire/Explosion Hazards.....	8
3.3.2 Heat Stress and Heat-Related Illness	9
3.3.3 Effects of Cold Exposure	10
3.3.4 Heavy Equipment Hazards	10
3.3.5 Noise Hazards	10

	<u>Page</u>
3.3.6 Electrical Hazards	11
3.3.7 Utilities.....	11
3.3.8 Weather Hazards.....	11
3.3.9 Trenching and Excavation Hazards	12
3.3.10 Entry into Excavations	12
3.4 Safe Work Practices	12
3.4.1 Site-Specific Work Practices	12
3.5 Environmental Monitoring.....	13
3.5.1 Calibration and Maintenance	13
4. EMPLOYEE TRAINING AND MEDICAL SURVEILLANCE.....	14
4.1 Site Workers.....	14
4.1.1 Subcontractor Training	14
4.1.2 Pre-Entry Orientation Session.....	14
4.2 Medical Surveillance	15
4.3 Hazard Communication Program	17
4.3.1 Hazard Communication	16
4.3.2 Hazard Communication Labeling	16
4.3.3 Material Safety Data Sheets.....	16
4.3.4 Hazard Communication Training	16
5. PERSONAL PROTECTIVE EQUIPMENT	18
5.1 Personal Protective Equipment Requirements.....	18
6. EMERGENCY RESPONSE AND REACTION TO SITE CONTINGENCIES.....	20
6.1 Emergency Recognition.....	20
6.2 Operations Shutdown.....	22
6.3 Procedures for Handling Emergency Incidents	22
6.4 Medical Emergencies.....	23
6.5 Fire/Explosion Emergencies	24
6.6 Emergency Telephone Numbers.....	25
6.7 Control of Site-Produced Ambient Noise Levels	25

	<u>Page</u>
7. SITE CONTROL AND WORK ZONES	26
7.1 Work Zones.....	26
ATTACHMENT A: SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN REVIEW RECORD	
ATTACHMENT B: SITE ENTRY AND EXIT LOG	
ATTACHMENT C: ACCIDENT/LOSS AND INCIDENT REPORT	

LIST OF FIGURES

<u>Number</u>	<u>Title</u>
1	Site Location Map
2	Emergency Route to Hospital Map

LIST OF TABLES

<u>Number</u>	<u>Title</u>
1	Potentially present compounds or substances
2	Emergency telephone numbers
3	Site contaminant monitoring requirements

1. INTRODUCTION

1.1 PURPOSE

The purpose of this Safety, Health, and Emergency Response Plan (SHERP) is to provide personnel with protection standards and mandatory safety practices, procedures, and contingencies to be followed while performing remediation activities at the property located at 55-61 Ponagansett Avenue in Providence, Rhode Island. The site location is provided on Figure 1. Site work is scheduled to begin in June 2010 and continue through construction activities until September 2010.

This SHERP, as developed, defines actions to be taken with respect to personal safety during work activities associated with remediation efforts defined in the Revised Remedial Action Work Plan (RAWP), prepared by EA and dated April 2010. Work activities include soil excavation, soil sampling, site grading, foundation excavations, the construction of an engineered cap, installation of plantings, and installation of a series of check dams. One copy of this SHERP will be maintained onsite for use during the scheduled field sampling effort and made available for site use/employee review. Persons who enter the site are required to read and understand this SHERP and sign the SHERP Review Record (Attachment A).

The remediation contractor(s) will prepare their own SHERP(s) under which their employees will operate. This SHERP will be used in conjunction with the remediation contractor(s') SHERPs and addresses the following regulations and guidance documents:

- Occupational Safety and Health Administration (OSHA) Standards for General Industry, 29 CFR 1910
- OSHA Standards for Construction Industry, 29 CFR 1926
- National Institute of Occupational Safety and Health, OSHA, U.S. Environmental Protection Agency, and U.S. Coast Guard *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985.

1.2 BACKGROUND

1.2.1 Site Description

The former Lincoln Lace & Braid complex is located at 55-61 Ponagansett Avenue in Providence, Rhode Island. The Site is located on approximately 6.0 acres of land adjacent to the Woonasquatucket River in the Hartford section of Providence, designated on the City of Providence Tax Assessor's Map as Plat 113, Lots 305 and 429.

The lot slopes down from south to north towards the Woonasquatucket River. Access from Ponagansett Avenue to the west is via a steep asphalt driveway (ca. 1950) that begins at the east end of the street, traverses the embankment on a south-north trajectory, and then swings sharply to the east across the now-filled headrace to reach the former building locations.

The embankment has been graded into three distinct terraces with retaining walls constructed of random and split stone and concrete masonry that step and slope down from south to north. A stepped, coursed, split masonry and concrete wall lines the east wall of the tailrace immediately south of the location of the former Wheel House. The remainder of the tailrace has earthen embankments that suggest its original appearance as a flood channel. No traces of other mill buildings remain except for rubble piles and large split rectangular blocks scattered across the lot.

The Woonasquatucket River's north-south trajectory defines the eastern edge of the mill site and holds the remains of the 1918 dam in its channel near the north end of the lot. Concrete and rubblestone stone masonry dam abutments are located on both riverbanks and retain cast imprints and wood fragments of the spillway's timber cribbing. Remains of both a late nineteenth-century and an early twentieth-century railroad bridge are located in the river channel approximately 240 feet downstream of the dam remains.

The former Ponagansett Avenue Landfill abuts the north end of the Site and is accessed by the same driveway. This facility has recently been remediated in preparation for its conversion to a public park (DEM Case No. 2001-024).

1.2.2 Remedial Action Scope

The RAWP includes the removal and offsite disposal of debris and litter, the construction of an engineered cap throughout the Site, wetland plantings, and the inception of an Environmental Land Use Restriction.

The Scope of Work covered by this SHERP is presented in the RAWP. The scope of this SHERP includes, but is not limited to, the following tasks anticipated during field activities:

- Material handling
- Engineered cap construction
- Seed and containerized plantings in and around surface water features.

1.2.3 Chemicals of Concern

Site contaminants of concern have been established based upon the previously-conducted Site Investigation. Petroleum, polycyclic aromatic hydrocarbons (PAHs), and metals (arsenic, beryllium, mercury, and lead) have been designated as the potential contaminants of concern in the surface soils across the Site. See Table 1 for a list of Potentially Present Compounds or Substances at the subject site.

1.3 SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN ORGANIZATION

This SHERP presents the overall approach to safety during execution of the remediation activities at the Lincoln Lace & Braid site. This section presents an introduction and outlines the report organization. Section 2 summarizes the project management team. Section 3 outlines the hazard communications and environmental monitoring during field operations. Section 4 presents the required employee training and medical surveillances. Section 5 details personnel protective equipment. Section 6 summarizes emergency response reactions to site contingencies. Section 7 outlines site controls and work zones. Attachment A contains a copy of the SHERP Review Record. Attachment B provides the Site Entry and Exit Log. Attachment C provides an Accident Report Form. Table 1 contains a listing of Potentially Present Compounds or Substances. Table 2 contains a list of Emergency Telephone Numbers, and Table 3 contains a list of Site Contaminant Monitoring Requirements.

2. PROJECT MANAGEMENT

2.1 KEY PERSONNEL

The following table contains information on key project personnel:

Position	Name	Work Phone	Home Phone
Program Manager	Richard Waterman	(401) 736-3440	(781) 254-1235
Project Manager	Frank Postma	(401) 736-3440	(443) 844-0007
Program Safety and Health Officer	Kris Hoiem	(410) 771-4950	(410) 357-5485
Field Manager	Ronald Mack	(401) 736-3440	(508) 272-3069
Site Safety and Health Officer/ Emergency Coordinator	Ronald Mack	(401) 736-3440	(508) 272-3069

2.2 RESPONSIBILITIES

Clear lines of authority will be established for enforcing compliance with the safety, health, and contingency procedures consistent with industry policies and procedures. Designated EA personnel are responsible for implementation of the SHERP during field activities. This includes field supervision; implementing and directing emergency operations; coordinating with onsite and offsite emergency responders; enforcing safe work practices and decontamination procedures (if needed); ensuring proper use of personal protective equipment (PPE); communicating site safety program modifications and requirements to site personnel; proper reporting of injuries, illnesses, and incidents to the appropriate internal and external organizations; and containing and controlling the loss of potentially hazardous materials to soil, air, and surface/groundwater during all phases of remediation operations.

In the event of an onsite injury, occupational illness, near miss, or environmental contamination incident, the following organizations/individuals will be notified:

- Field Manager
- Site Safety and Health Officer/Emergency Coordinator
- Project Manager
- Program Safety and Health Officer
- Program Manager

2.2.1 Program Manager

The *Program Manager* has overall responsibility for project completion and will be the primary contact during the course of project completion. The Program Manager is the main contact person for interactions with the client and applicable regulatory agencies in non-emergency settings.

2.2.2 Project Manager

The *Project Manager* has overall responsibility for site activities and will be the primary contractor and subcontractor contact during work activities.

2.2.3 Program Safety and Health Officer (or Designee)

The *Program Safety and Health Officer* has overall project responsibility for the development of this SHERP and will provide technical safety and health information, as needed.

2.2.4 Site Safety and Health Officer/Emergency Coordinator

The *Site Safety and Health Officer/Emergency Coordinator* is responsible for coordination of onsite contingency operations, as well as the Site Safety and Health Program. The Site Safety and Health Officer/Emergency Coordinator will be onsite throughout the project and will be responsible for daily compliance with site safety and health requirements.

During an emergency, the Field Manager and Site Safety and Health Officer/Emergency Coordinator will be responsible for initiating and coordinating emergency responses/contingency operations with offsite emergency responders.

The Program Safety and Health Officer, Field Manager, and Site Safety and Health Officer/Emergency Coordinator will have the authority to make on-the-spot corrections concerning safety, health, and environmental pollution infractions.

2.2.5 Field Manager

The *Field Manager's* responsibilities include, but are not limited to, providing technical support to the Site Safety and Health Officer/Emergency Coordinator, evaluating onsite environmental monitoring results and reporting to the Project Manager and Program Safety and Health Officer, initiating evacuation of the work site when needed, communicating with offsite emergency responders, and coordinating activities of onsite and offsite emergency responders.

2.2.6 EA Employee Responsibilities

EA and subcontractor employees are responsible for reading, understanding, and meeting the safety and health requirements contained in this SHERP. A Review Record sign-off sheet is provided in Attachment A. Employees are required to implement these procedures when conducting daily operations. This will also include receiving appropriate training and medical monitoring and utilization of EA-provided safety and health equipment (to include PPE) to safely conduct site operations, as well as maintaining appropriate grooming standards (removal or proper trimming of beards, mustaches, and sideburns) to ensure the proper fit of respiratory protection. Employees will review each task prior to commencement to consider the potential

safety and health hazards and the measures to be taken in the event of an emergency. Employees should know where material safety data sheets, first aid supplies, and emergency equipment are maintained. The Field Manager and Site Safety and Health Officer/Emergency Coordinator should be notified of potential safety and health hazards, near-miss conditions, or incidents present on the job site or unusual effects believed to be related to hazardous chemical exposures. Failure to follow established safety and health procedures could result in immediate dismissal from the site and, if repeated, a potential loss of employment.

2.2.7 Subcontractors

Responsibilities of EA personnel and EA subcontractor personnel include: following the SHERP and applicable safety and health rules, regulations, and procedures; using required controls, procedures, and safety devices, including PPE; notifying his/her supervisor of identified or suspected emergencies, safety, or health hazards; and complying with training and medical requirements.

3. HAZARD COMMUNICATION AND ENVIRONMENTAL MONITORING DURING FIELD OPERATIONS

3.1 HAZARD COMMUNICATION

Material Safety Data Sheets for each chemical brought onsite during field activities will be kept onsite by the Field Manager. Subcontractors must inform the Field Manager and/or the Site Safety and Health Officer/Emergency Coordinator of hazardous substances brought onsite and provide appropriate material safety data sheets to the Field Manager. Chemicals brought onsite must be labeled in accordance with OSHA Hazard Communication Requirements, 29 CFR 1910.1200.

3.2 CHEMICAL HAZARDS

3.2.1 Areas of Concern - Chemical Hazards

Assumptions regarding chemical constituents were made by reviewing information on past activities conducted at Lincoln Lace & Braid, including a Remedial Evaluation Report prepared by the Rhode Island Department of Environmental Management (RIDEM) and dated December 1999 and through soil sampling activities that are summarized in the RAWP completed by EA. Areas of concern and the associated chemicals of concern were identified in the above-mentioned reports.

Chemicals of concern within Site soils may present a hazard to site personnel. Hazard pathways include inhalation and ingestion. Contaminated soil can be inadvertently ingested through smoking, eating, or drinking in the project area. Petroleum and metals can also be ingested by engaging in smoking, eating or drinking with contaminated hands, whether inside or outside the project area. Employees must wash their hands and face prior to smoking, eating, or drinking in designated clean areas (Support Zone). Employees who exhibit symptoms of overexposure to any of the Site chemicals of concern, as listed in Table 1, should report their condition immediately to the SSHO, who will then convey the information to the personnel listed in Section 2.1 of this SHERP. Table 1 provides a list of chemicals of concern and symptoms of overexposure.

3.2.2 Chemicals for Equipment Calibrations and Decontamination Operations

The following chemicals are typically supplied by the field team for confirmatory soil sample collection:

- Isopropyl alcohol
- Isobutylene calibration gas

- Methane calibration gas
- Alconox.

These chemicals will be used for equipment calibration, operation, and sampling equipment decontamination. The quantities to be used will not exceed 0.5 L quantities and will be used under contained environments. Chemicals used during the field activities will be properly contained and labeled. The decontamination wastewater will be containerized as part of the investigation-derived waste where required by regulations. Occupational exposures will be negligible.

3.3 PHYSICAL HAZARDS

Physical hazards can potentially be present during field activities. These physical hazards may include, but are not limited to:

- Fire/explosion hazards
- Heat/cold stress
- Equipment hazards
- Slips, trips, and falls
- Vehicle and pedestrian hazards
- Noise hazards
- Electrical hazards
- Utilities
- Weather hazards
- Trenching and Excavation
- Entry into Excavations.

The Lincoln Lace & Braid Site will be visually inspected for the presence of general safety hazards (e.g., trip/slip hazards, unstable surfaces or steep grades, and sharp objects) prior to beginning work. If hazards are present, these hazards will be recorded and precautionary measures taken to prevent injury.

3.3.1 Fire/Explosion Hazards

The potential for fire and/or explosion emergencies is always present. Workers must continuously monitor the work area for combustible or explosive gases when operations have the potential to generate sparks. Employees should always be alert for unexpected events, such as ignition of chemicals or sudden release of materials under pressure, and be prepared to act in these emergencies.

Field vehicles will be equipped with a fire extinguisher. Employees must be trained in the proper use of fire suppression equipment. However, professionals should handle large fires that cannot

be controlled with a fire extinguisher. The proper authorities should be notified in these instances.

3.3.2 Heat Stress and Heat-Related Illness

Effects of heat stress and illness are unlikely during the performance of field activities at Lincoln Lace & Braid. However injury from heat exposure may occur to persons working outdoors during a period of high temperature conditions and when personnel are working in PPE clothing. The body's principal means of cooling is through the evaporation of sweat. When personnel are working in PPE, sweat is trapped inside the clothing and cannot evaporate, thus raising the body's core temperature and resulting in a heat-related illness. If work in Level C PPE is required and the temperature is above 70°F, the Site Safety and Health Officer will monitor workers' heart rates and keep the workers' heart rates below 110 beats per minute.

Illness resulting from exposure to extreme heat is possible during field operations. Personnel will be familiar with the signs and symptoms of heat stress, including:

- **Heat Cramps** - Muscle spasms in the abdomen or limbs
- **Heat Exhaustion** - Dizziness, lightheadedness, slurred speech, rapid pulse, confusion, fainting, fatigue, copious perspiration, cool skin that is sometimes pale and clammy, and nausea
- **Heat Stroke** - Hot, dry, flushed skin; delirium; and, in some cases, coma. Heat stroke is a life-threatening event and requires immediate medical attention.

Some preventive measures to avoid heat stress include:

- Frequent resting in cool or shaded areas
- Consumption of large quantities of fresh potable water or diluted electrolyte beverages

A suggested work-rest regimen is:

Ambient Temperature	Work	Rest
70°F	3 hours	15 minutes
75°F	2.5 hours	15 minutes
80°F	2 hours	15 minutes
85°F	1.5 hours	15 minutes
90°F	1 hour	15 minutes

Other factors, such as a worker's acclimatization, level of physical fitness, and age, may increase or decrease his or her susceptibility to heat stress. Before assigning a task to an individual worker, these factors will be taken into account to ensure that the task will not endanger the worker's health.

If a heat-related illness is suspected or observed, the affected person must be moved to a cool or shaded area and given plenty of liquids to consume. If symptoms of a heat stroke are observed, the victim will be cooled immediately and transported to the hospital. Liquids will be readily available to ensure that workers stay hydrated.

3.3.3 Effects of Cold Exposure

Effects of cold exposure are possible during the performance of field activities at the Lincoln Lace & Braid site. Injury from cold exposure may occur in persons working outdoors during a period when temperatures average below freezing. The extremities, such as fingers, toes, and ears, are the most susceptible to frostbite.

Symptoms of cold stress include shivering, pain in the extremities, numbness, drowsiness, white or grayish skin, confusion, or fainting. To prevent cold stress, personnel should wear layers of loose-fitting clothing and head covering. Protection of the hands, feet, and head is particularly important because these are the areas most likely to be injured first by the cold. Bare skin contact with cold surfaces must be avoided.

3.3.4 Heavy Equipment Hazards

The use of heavy equipment (e.g., excavators, backhoes, generators, etc.) may pose safety hazards to site workers. Heavy equipment work must be conducted only by trained, experienced, and licensed/certified personnel. If possible, personnel must remain outside the turning radius of large, moving equipment. At a minimum, personnel must maintain visual contact with the equipment operator. No guards, safety appliances, or other devices may be removed or made ineffective unless repairs or maintenance are required, and then only after power has been shut off, tagged, and locked out. Safety devices must be replaced once repair or maintenance is complete. Exhaust from equipment must be directed so that it does not endanger workers or obstruct the view of the operator. When not operational, equipment must be set and locked so that it cannot be activated, released, dropped, etc.

3.3.5 Noise Hazards

Work around large equipment often creates excessive noise. Noise can cause workers to be startled, annoyed, or distracted; can cause physical damage to the ear, pain, and temporary and/or permanent hearing loss; and can interfere with communication. If workers are subjected to noise exceeding an 8-hour time-weighted average sound level of 85 dBA (decibels on the A-weighted scale), hearing protection will be selected with an appropriate noise reduction rating to comply with 29 CFR 1910.95 and to reduce noise levels to or below the permissible values. Therefore, during field activities in which workers are using heavy equipment, such as drill rigs and backhoes, etc., hearing protection must be utilized at these times.

3.3.6 Electrical Hazards

Overhead power lines, electrical wiring, electrical equipment (electrical generators), and buried cables pose risks to workers of electric shock, burns, muscle twitches, heart fibrillation, and other physical injuries, as well as fire and explosion hazards. Workers will take appropriate protective measures when working near live electrical parts, including inspection of the work area, to identify potential spark sources, maintenance of a safe distance, proper illumination of the work areas, provision of barriers to prevent inadvertent contact, and use of nonconductive equipment. If overhead lines cannot be de-energized prior to the start of work, a 10-ft distance must be maintained between overhead energized power lines with a voltage of 50 kV and elevated equipment parts. This distance will be increased 4 in. for every 10 kV greater than 50 kV. For example, workers must maintain a distance of 11.7 ft from energized power lines with a voltage of 100 kV.

3.3.7 Utilities

Underground utilities pose hazards to workers involved in excavation and other invasive operations. These hazards include electrical hazards, explosion, and asphyxiation, as well as costly and annoying hazards associated with damaging communication, sewer, and water lines. Prior to commencement of invasive operations, Rhode Island Dig Safe will be contacted by the General Contractor for this project to inspect and flag the area of construction. Dig Safe's telephone number in Rhode Island is (888) 344-7233 and requires 3 days' notice prior to intrusive activities on the site.

Personnel should be aware that, although an area may be cleared, it does not mean that unanticipated hazards will not appear. Workers should always be alert for unanticipated events such as snapping cables, excavating into unmarked underground utilities, and excavating into a heavily contaminated zone, etc. Such occurrences should prompt involved individuals to halt work immediately and take appropriate corrective measures to gain control of the situation.

3.3.8 Weather Hazards

Weather conditions should always be taken into consideration. Heavy rains or snowfall, electrical storms, high winds, and extreme temperatures, for example, may create extremely dangerous situations for employees. Equipment performance may also be impaired because of inclement weather. Whenever unfavorable conditions arise, the Site Safety and Health Officer/Emergency Coordinator will evaluate both the safety hazards and ability of the employees to effectively perform given tasks under such conditions. Activities will be halted at their discretion.

Wind direction should be accounted for when positioning equipment at sampling locations. If exposure to organic vapors or dust emissions is anticipated, workers should locate upwind of sampling point. Wind direction often changes abruptly and without warning, so personnel should always be prepared to reposition, if necessary.

3.3.9 Trenching and Excavation Hazards

Open excavations and trenches pose a variety of hazards to site workers and equipment working near or inside them, including cave-in hazards (worsened by water accumulation in some excavations), contact with underground utilities, vehicle and pedestrian traffic hazards, dangers from falling loads, hazardous atmospheres inside and emitted from excavations, stability of adjacent structures, and loose rock and soil. OSHA's standard for Excavations (29 CFR 1926.650-.652) will be enforced at excavation sites. The General Contractor's Health & Safety Plan will supersede EA's SHERP for all non-EA employees at Lincoln Lace & Braid.

Personnel are not permitted underneath any loads, including those being removed from an excavation. When mobile equipment is operated adjacent to an excavation or will approach the edge of an excavation, a warning system will be utilized such as barricades, hand or mechanical signals, or stop logs. Where the stability of adjacent building, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning will be provided to ensure the stability of such structures for the protection of employees.

3.3.10 Entry into Excavations

No site personnel are permitted to enter excavations greater than 4 ft in depth (considered a Confined Space) without permission of the General Contractor's Site Superintendent. Excavation of 5 ft or greater require specialized shoring, shielding, or sloping and must be inspected by a competent person prior to anyone entering an excavation. The competent person will document his/her findings, including assumptions used in determining that the excavation is safe for entry and the conditions of the excavation. If deemed necessary by the competent person, protective systems (e.g., sloping, benching, and supports/shields) will be designed by a professional engineer according to the requirements of 29 CFR 1926.652 and implemented prior to personnel entering the excavation.

However, excavations during the project are not expected to exceed 4 ft in depth, and therefore specialized excavation controls/inspection will not be required during the project. Excavations will however, be inspected daily by the Site Manager as part of routine daily inspections to ensure that safe conditions exist, and that no hazards exist within them. Personnel will not work in excavations in which water has accumulated or is accumulating, regardless of depth.

3.4 SAFE WORK PRACTICES

3.4.1 Site-Specific Work Practices

Safe work practices that must be followed by site workers include:

- Eat, drink, and smoke only in those areas designated by the Site Safety and Health Officer/Emergency Coordinator. These activities will not take place within any work zone.
- In the event the potential for chemical contamination exists onsite, employees will wash and conduct appropriate decontamination activities.
- Defective PPE must be repaired or replaced immediately.
- Any employee required to take prescription drugs will notify the Field Manager and/or Site Safety and Health Officer/Emergency Coordinator prior to the start of work. Controlled or unauthorized drugs will **not** be permitted onsite at any time.

3.5 ENVIRONMENTAL MONITORING

For the intrusive work (e.g., utility and foundation excavations) conducted onsite, the environmental monitoring for hazardous gases will be performed as needed using a photoionization detector (PID). Only employees who have been trained in the proper operation, use limitations, and calibration of the monitoring instruments will use the PID. Monitoring will be conducted at intervals not greater than once every 30 minutes using the photoionization detector. Instrument calibration and measurements taken will be logged in the field notebook.

Environmental monitoring will include sufficient monitoring of air quality in work zones during intrusive field operations to assess levels of employee exposure and to verify that the level of PPE being worn by personnel is adequate. Monitoring will be conducted to ensure that contaminants are not migrating offsite to minimize the exposure to nearby populations and/or workers. See Table 3 for site contaminant monitoring requirements.

Visible dust in the breathing zone will be suppressed by dust suppression techniques or work practices. If visual dust in the breathing zone continues, dust monitoring will be implemented.

3.5.1 Calibration and Maintenance

Direct-reading instruments will be calibrated on a daily basis and prior to use with a known concentration of calibration following the instrument manufacturer's guidance. Instructions in the manufacturer's operations manual regarding storage, cleaning, and maintenance of the instruments will be followed. Calibration will be properly recorded in the field logbook to show the date, calibration material type and concentration, and the actual reading obtained. Equipment failing to meet the manufacturer's standards for accuracy and repeatability will be considered suspect and replaced with an alternate, properly functioning piece of equipment.

4. EMPLOYEE TRAINING AND MEDICAL SURVEILLANCE

4.1 SITE WORKERS

Personnel who will be performing construction-related, non-intrusive, non-hazardous onsite tasks are not required to have been trained according to U.S. Department of Labor OSHA Standard 29 CFR 1926.65, *Hazardous Waste Operations and Emergency Response*. These workers will have appropriate safety and health training based upon their specific job tasks and activities.

The Field Manager, Site Safety and Health Officer/Emergency Coordinator or other personnel conducting the field sampling and monitoring for site gases and vapors during intrusive operations (e.g., utility trenching) will be trained as required to meet the U.S. Department of Labor OSHA Standard, 29 CFR 1926.65, *Hazardous Waste Operations and Emergency Response* to qualify as hazardous waste site workers and supervisor. Training will include:

- A minimum of 40 hours of initial offsite instruction
- A minimum of 3 days of actual field experience under the direct supervision of a trained, experienced supervisor
- An 8-hour “refresher” training period annually
- Additional training that addresses unique or special hazards/operational requirements.

Onsite supervisors who are directly responsible for or who supervise employees will receive at least 8 additional hours of hazardous waste operations training for supervisors. Copies of training certificates and dates of attendance for EA personnel will be available through the Site Safety and Health Officer/Emergency Coordinator upon request.

4.1.1 Subcontractor Training

The Project Manager will obtain a written list of subcontractor personnel to be onsite for intrusive site activities only. The subcontractor will provide written certification from subcontractor management that these workers meet the training requirements for their assigned tasks to conduct intrusive activities, such as drilling, excavation, or geoprobing.

4.1.2 Pre-Entry Orientation Session

Prior to entering the site, personnel will attend a pre-entry orientation session presented by the Site Safety and Health Officer/Emergency Coordinator. Personnel will verify attendance at this meeting by signing the SHERP Review Record provided in Attachment A. Visitors entering

designated work areas will be subject to applicable safety and health regulations during field operations at the site. The Field Manager and/or Site Safety and Health Officer/Emergency Coordinator is responsible for briefing the personnel onsite of potential hazards that may be encountered on the site, the presence and location of the site SHERP, and emergency response procedures. Visitors will be under the direct supervision of the Field Manager and/or Site Safety and Health Officer/Emergency Coordinator or his/her representative.

At a minimum, the pre-entry orientation session will discuss the contents of this SHERP, the PPE, potential hazards and health effects of hazards associated with onsite activities, and the potential hazards presented by unearthing unidentified hazardous materials. Personnel will be instructed in the emergency procedures to include onsite communications and implementation of the site-specific contingency plans.

4.2 MEDICAL SURVEILLANCE

Non-hazardous waste site workers will be medically examined to meet OSHA requirements specific to their job. Hazardous waste site workers must have satisfactorily completed a comprehensive medical examination by a licensed physician within 12 months (or 24 months, pending physician's approval) prior to the start of site operations. Subcontractors will provide this information in writing to the Project Manager for their workers prior to mobilization onsite. Copies of this information will be kept onsite by the Site Safety and Health Officer/Emergency Coordinator. A licensed physician who is certified in Occupational Medicine by the American Board of Preventative Medicine will review medical surveillance protocol and examination results. Medical surveillance protocols will comply with 29 CFR 1910.120. The content of medical examinations will be determined by the attending physician and will be based upon the guidelines in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*. Medical examinations and consultations will be provided for employees covered by this program on the following schedule:

- Prior to field work assignment
- At least annually for employees covered by the program
- At termination of employment or reassignment to an area where the employee would not be covered if the employee has not been examined within the past 6 months
- As soon as possible upon the development of signs or symptoms that may indicate an overexposure to hazardous substances or other health hazards or that an unprotected person has been exposed in an emergency situation
- More frequently if the physician deems such examination necessary to maintain employee health.

An accurate record of the medical surveillance will be maintained for each employee for a period of no less than 30 years after the termination of employment. Records will be managed and maintained per recordkeeping provisions of EA's *Safety and Health Program Manual* (SHP-001). Records must include at least the following information about the employee:

- Name and social security number
- Physician's written opinions, recommendations, limitations, and test results
- Employee medical complaints related to hazardous waste operations
- Information provided to the physician by the employee concerning possible exposures, accidents, etc.

4.3 HAZARD COMMUNICATION PROGRAM

4.3.1 Hazard Communication

The Site Safety and Health Officer/Emergency Coordinator will conduct regularly scheduled safety meetings with site workers to discuss the planned activities, since these activities and workers may change over the duration of the project. The objective of instituting a Hazard Communication Program is to ensure that hazards associated with the site and with chemicals brought onsite by EA or subcontractors are evaluated and that information concerning these hazards is transmitted to site employees. Site personnel include EA and subcontractor employees, manufacturer's representatives or local agency employees, and other workers who observe or perform services onsite. Employee awareness of chemical identities, health and physical hazards, properties, and characteristics is essential to safely handle chemicals and to minimize potential hazards. The Hazard Communication Program must follow OSHA requirements listed in 29 CFR 1926.59.

4.3.2 Hazard Communication Labeling

The Site Safety and Health Officer/Emergency Coordinator will ensure that containers are properly labeled and that workers know the contents of containers. Container labels will contain, at a minimum, information on name of product on container, chemical(s) in product, manufacturer's name and address, protective equipment required for the safe handling of the product, and first aid procedures in case of overexposure to product contents.

4.3.3 Material Safety Data Sheets

The Site Safety and Health Officer/Emergency Coordinator will maintain a current alphabetical file of complete material safety data sheets for each hazardous substance stored or used at the work site. The file must be easily accessible to employees. Subcontractors and visitors to the

workplace will be informed of the existence and location of this file. Workers and visitors will be instructed on how to read and understand the information shown on the material safety data sheets. Subcontractors must inform the Site Safety and Health Officer/Emergency Coordinator about hazardous substances that they bring onsite and provide material safety data sheets.

4.3.4 Hazard Communication Training

Site workers and visitors will be informed of the Hazard Communication Program, their legal rights under the program, the location of the chemical inventory, and the location of the material safety data sheets file. Prior to site work or potential exposure to hazardous substances, the Site Safety and Health Officer/Emergency Coordinator will describe hazardous substances routinely used and provide information about:

- Nature of potential chemical hazards
- Appropriate work practices
- Appropriate control programs
- Appropriate protective measures
- Methods to detect presence or release of hazardous substances
- Emergency procedures.

5. PERSONAL PROTECTIVE EQUIPMENT

5.1 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Based upon currently available information, the site will require Level D protection for anticipated conditions and intrusive activities. In the event that potential chemical hazards are identified, the level of protection may be upgraded appropriately to the potential hazard conditions. Only those personnel identified and qualified for hazardous waste work as defined in 29 CFR 1926.65 will be allowed to upgrade beyond Level D or provide support of hazardous material/substance contingency operations. Only the Site Safety and Health Officer/Emergency Coordinator, in conjunction with the Program Safety and Health Officer, will be allowed to approve PPE upgrade beyond Level D and site re-entry for the purpose of hazardous conditions assessment.

The following is a list of the Level D PPE components for the minimum level of protection authorized for use during this project.

- Coveralls or appropriate work clothes
- Steel-toe, steel-shank safety boots/shoes
- Hard hats (with overhead activities such as drilling, excavation, and other heavy equipment operation)
- Chemical-resistant gloves (nitrile) as appropriate to prevent contact with contaminated soil
- Leather work gloves (as needed)
- Safety glasses with side shields and face shield (as needed) or impact-resistant chemical goggles; safety glasses, goggles, and face shields will meet American National Standards Institute requirements for impact resistance and safety
- Hearing protection (as needed).

The following is a list of the Modified Level D PPE components for the minimum level of protection authorized for use during this project.

- Tyvek (as needed)
- Steel-toe, steel-shank safety boots/shoes

- Boot covers for steel-toe boots (as needed)
- Hard hats (with overhead activities such as drilling, excavation, and other heavy equipment operation)
- Chemical-resistant gloves (nitrile) as appropriate to prevent contact with contaminated soil
- Leather work gloves (as needed)
- Safety glasses with side shields and face shield (as needed) or impact-resistant chemical goggles; safety glasses, goggles, and face shields will meet American National Standards Institute requirements for impact resistance and safety
- Hearing protection (as needed).

The following is a list of the Level C PPE components for the maximum levels of protection authorized for use during this project:

- Full-face, air purifying respirator equipped with combination organic vapor and high efficiency particulate cartridges
- Poly-coated Tyvek coveralls
- Steel-toe, steel-shank safety boots/shoes
- Chemical-resistant boot covers
- Hard hat
- Hearing protectors
- Chemical-resistant gloves (neoprene or nitrile) as appropriate to prevent contact with contaminated soil.

6. EMERGENCY RESPONSE AND REACTION TO SITE CONTINGENCIES

6.1 EMERGENCY RECOGNITION

Prior to work startup, personnel must be familiar with emergency condition identification, notification, and response procedures. The emergency telephone numbers for local emergency response and reporting organizations and directions to the nearest hospital are provided in Table 2. Figure 3 shows the map with directions to the hospital. The Field Manager, along with the Site Safety and Health Officer/Emergency Coordinator, will rehearse/review emergency procedures and/or applicable site contingencies initially during site orientation and as part of the ongoing site safety program with EA and subcontractor personnel. Offsite emergency personnel will ultimately handle onsite emergencies. Initial response and first aid treatment, however, will be provided onsite.

Person(s) identifying an accident, injury, emergency condition, or a scenario requiring implementation of a response in support of this SHERP will immediately take actions to report the situation to the Field Manager and Site Safety and Health Officer/Emergency Coordinator. Notification may take place by runner, hand-held radio, or telephone. The Field Manager and Site Safety and Health Officer/Emergency Coordinator will initiate the required response based upon the type of incident, following the procedures contained in this SHERP. Chain-of-command and sign-in sheets for personnel on the site will be established at the beginning of each workday to ensure that personnel are accounted for and who will take control should the Field Manager and/or Site Safety and Health Officer/Emergency Coordinator become injured. The following items constitute those site conditions requiring an emergency response or contingency action in accordance with this SHERP:

- Fire/explosion
- Heavy equipment accident
- Natural disaster
- Medical emergency
- Discovery of unanticipated hazards (e.g., unmarked utility lines, heavily contaminated material).

Follow-up operations to evaluate and control the source of fire, explosions, and hazardous materials incidents will occur only after discussion with the Project Manager, Field Manager, and/or Site Safety and Health Officer/Emergency Coordinator. The Field Manager and/or Site Safety and Health Officer/Emergency Coordinator will act as the Emergency Coordinator at the site to coordinate onsite activities and contingencies with outside response organizations. If the Field Manager is unable to act as the emergency coordinator, the authority to take action will be transferred to the Site Safety and Health Officer/Emergency Coordinator, or other designee, as indicated in the daily updated chain-of-command.

6.2 OPERATIONS SHUTDOWN

The Site Manager, the Site Safety and Health Officer/Emergency Coordinator, or the Project Manager may mandate operations shutdown. Conditions warranting work stoppage will include (but are not limited to):

- Uncontrolled visible dust migration
- Uncontrolled fire
- Explosion
- Uncovering potentially dangerous buried hazardous materials
- Conditions immediately dangerous to life and health or the environment
- Potential for electrical storms
- Treacherous weather-related conditions
- Limited visibility
- Air contaminant concentrations in excess of the action levels contained in Table 3.

6.3 PROCEDURES FOR HANDLING EMERGENCY INCIDENTS

In the event of an emergency, the information available at that time must be properly evaluated and the appropriate steps taken to implement the emergency response plan. The Site Safety and Health Officer/Emergency Coordinator will assume command of the situation. He/she will alert the emergency management system per Table 2 and evacuate personnel to the pre-designated evacuation location. The Site Safety and Health Officer/Emergency Coordinator will make required notifications to include, but not be limited to, the EA Project Manager and EA Program Safety and Health Officer, as defined in this SHERP and Table 2, and the appropriate federal and state agencies.

Site personnel will have the capability of notifying emergency responders directly from the site using the phone in the company vehicle or in the site support office.

The Site Safety and Health Officer will complete and submit to the Project Manager an Accident/Loss and Incident Report using the format contained in Attachment C. The following information will be provided when reporting an emergency:

1. Name and location of person reporting
2. Location of accident/incident
3. Name and affiliation of injured party
4. Description of injuries, fire, spill, or explosion
5. Status of medical aid and/or other emergency control efforts
6. Details of chemicals involved
7. Summary of accident, including suspected cause and time it occurred
8. Temporary control measures taken to minimize further risk.

This information is not to be released under any circumstances to parties other than those listed in this section and emergency response team members. Once emergency response agencies have been notified, the Project Manager will be immediately notified.

6.4 MEDICAL EMERGENCIES

Personnel should always be alert for signs and symptoms of illnesses related to chemical, physical, and onsite health hazards. Severe injuries resulting from accidents must be recognized as emergencies and treated as such. At least one person currently trained in first aid/ cardiopulmonary resuscitation must be present onsite. This will normally be the Site Safety and Health Officer/Emergency Coordinator.

In a medical emergency, the Site Safety and Health Officer/Emergency Coordinator must sound the emergency alarm, upon which work must stop and personnel must move to the predesignated evacuation location. **If the emergency situation cannot be conveyed by word of mouth, a whistle or other horn will be sounded. Three short blasts, separated by a 2-second silence, will be used as the emergency signal.** Personnel currently trained in first aid will evaluate the nature of the injury, decontaminate the victim (if necessary), and initiate first aid assistance immediately and transport if appropriate. First aid will be administered only to limit further injury and stabilize the victim. The local Emergency Medical Services must be notified immediately if needed. **The route to the nearest hospital is shown on Figure 2.** Figure 2 shows a large-scale view and the distance to the hospital from the Lincoln Lace & Braid site.

Although not anticipated, victims who are heavily contaminated with toxic or dangerous materials must be decontaminated before being transported from the site. Since heavy contamination is not anticipated, a formal decontamination station will not be available. Decontamination will consist of removal of contaminated coveralls/clothing, and wrapping the victim in a sheet or other clothlike material. No persons will re-enter the site of injury/illness until the cause of the injury or symptoms has been determined and controlled. At no time will personnel transport victims to emergency medical facilities unless the injury does not pose an immediate threat to life and transport to the emergency medical facility can be accomplished without the risk of further injury. Emergency Medical Services will be used to transport serious injuries offsite unless deemed otherwise by the Site Safety and Health Officer/Emergency Coordinator.

The Site Safety and Health Officer/Emergency Coordinator must complete an Accident/Loss and Incident Report (Attachment C) and submit it to the Project Manager within 24 hours of the following types of incidents:

- Job-related injuries and illnesses
- Accidents resulting in loss or damage to property

- Accidents involving vehicles and/or vessels, whether or not they result in damage to property or personnel
- Accidents in which there may have been no injury or property damage but which have a high probability of recurring with at least a moderate risk to personnel or property
- Near-miss incidents that could have resulted in any of the conditions defined above.

An accident that results in a fatality or the hospitalization of three or more employees must be reported within 8 hours to the U.S. Department of Labor through the Project Manager. Subcontractors are responsible for their reporting.

In order to support onsite medical emergencies, first aid/emergency medical equipment will be available at the following locations:

- First-aid kit Company vehicle
- Emergency alarm Horn on the company vehicle
- Copy of the SHERP Company vehicle
- Copy of the RAWP Company vehicle
- Telephone Company vehicle.
- Fire extinguisher Company vehicle

The eyewash kit must be portable and capable of supplying at least a 15-minute supply of potable water to the eyes.

6.5 FIRE/EXPLOSION EMERGENCIES

Fire and explosion must be immediately recognized as an emergency. The Site Safety and Health Officer/Emergency Coordinator must sound an emergency signal, and personnel must be decontaminated (if necessary) and evacuated to the pre-designated evacuation location. Only persons properly trained in fire suppression and other emergency response procedures will support control activities. Control activities will consist of the use of onsite portable fire extinguishers for limited fire suppression and employee evacuation. Upon sounding the emergency alarm, personnel will evacuate the hazard location and assemble at the designated site meeting area. Only the Site Safety and Health Officer/Emergency Coordinator, or those site personnel trained in the use of portable fire extinguisher use, will attempt to suppress a site fire. Small, multi-purpose dry chemical extinguishers will be maintained in each EA vehicle onsite. Fires not able to be extinguished using onsite extinguishers will require the support of the local Fire Department. The Site Safety and Health Officer/Emergency Coordinator should take measures to reduce injury and illness by evacuating personnel from the hazard location as quickly as possible. The Site Safety and Health Officer/Emergency Coordinator must then notify the local Fire Department. The Site Safety and Health Officer/Emergency Coordinator will determine proper followup actions. Site personnel will not resume work during or after a

fire/explosion incident until the Emergency Coordinator has directed that the incident is over and work may resume. During the incident, site personnel will remain outside the incident area and obey the instructions of the Emergency Coordinator.

6.6 EMERGENCY TELEPHONE NUMBERS

Communications will be by telephones located in the EA vehicle onsite, and field personnel will have access to this telephone to directly contact offsite emergency response organizations. Refer to Table 2 for a listing of emergency telephone numbers.

6.7 CONTROL OF SITE-PRODUCED AMBIENT NOISE LEVELS

In order to maintain ambient noise levels within acceptable standards, site activities will take place between the hours of 0700 to 1900 hours each workday. Complaints by local inhabitants received by the Site Safety and Health Officer/Emergency Coordinator will prompt sound level reduction measures as needed.

7. SITE CONTROL AND WORK ZONES

The following work zones will be established during implementation of the Lincoln Lace & Braid RAWP Program as a means of site control.

7.1 WORK ZONES

Work zones will be established in accordance with the following:

- **Exclusion Zone (EZ)**—The EZ at the Site will be designated prior to intrusive activities. For this RAWP described remediation and engineered cap installation, the entire site will be considered as the EZ. Personnel entering the EZ must wear the prescribed level of protective equipment. Unauthorized personnel will not be allowed in this area. This area has either known or potential contamination and has the highest potential for exposure to chemicals onsite. Persons who enter the EZ must wear the appropriate level of PPE for the degree and types of hazards present at the site. If the EZ is subdivided, different levels of PPE may be appropriate. Each sub-area of the EZ should be clearly marked to identify hazards and required level of PPE.
- **Contamination Reduction Zone (CRZ)**—The purpose of the CRZ is to reduce the possibility that the Support Zone (SZ) will become contaminated or affected by the site hazards. Because of both distance and decontamination procedures, the degree of contamination in the CRZ generally will decrease as one moves from the EZ to the SZ. The CRZ will be established outside the areas of known or potential contamination. Contamination Reduction Corridors, which are access control points between the EZ and CRZ, should be established for both personnel and heavy equipment. These corridors should consist of an appropriate number of decontamination stations necessary to address the contaminants of the particular site (see National Institute of Occupational Safety and Health/OSHA/U.S. Coast Guard/U.S. Environmental Protection Agency *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985 for information on decontamination procedures and work zones).
- **Support Zone**—The SZ is the uncontaminated area where workers are unlikely to be exposed to hazardous substances or dangerous conditions. The SZ is the appropriate location for the command post, equipment and supply center, field laboratory, and other administrative or support functions that are necessary to keep site operations running efficiently. Potentially contaminated clothing, equipment, and samples must remain outside the SZ until decontaminated. However, personnel located in the SZ must receive instruction in proper evacuation procedures in case of a hazardous substance emergency. The SZ should be upwind and as far from the EZ as practicable.

The level of PPE will depend upon the type of work performed and site monitoring data. Level D will be the minimum protection in the EZ and the CRZ. No specific PPE requirements are needed in the SZ, as contaminated materials are prohibited from being stored in this area. Only authorized personnel will be permitted in the EZ and CRZ. Entering these zones will require donning the required PPE prior to entry. These zones will be established prior to beginning the field activities.

Safe work practices to be followed by site workers include:

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the EZ and CRZ.
- Hands and face must be thoroughly washed upon leaving the work area.
- Personnel must not take prescription drugs unless specifically approved by a licensed physician who is familiar with the issues of worker exposure to hazardous materials.
- When respirators are required, facial hair that interferes with the face-to-facepiece fit of the respirator will not be permitted.
- Personnel onsite must use the buddy system; visual contact must be maintained between team members.
- Work is allowed during daylight hours only.
- If dust is being visually generated in the EZ, the Site Safety and Health Officer/ Emergency Coordinator will advise on procedures for misting or wetting the soil to prevent possible exposure from inhalation of soil contaminants.
- Possessing, using, purchasing, distributing, selling, or having controlled substances in your system during the workday, including meal or break periods onsite, is strictly prohibited.
- The use or possession of alcoholic beverages onsite is prohibited. Similarly, reporting to work or performing one's job assignments with excessive levels of alcohol in one's system will not be permitted.

TABLE 1 POTENTIALLY PRESENT COMPOUNDS OR SUBSTANCES

Compound	PEL/TLV ^(a)	Signs and Symptoms of Exposure
POTENTIAL SITE CONTAMINANTS OF CONCERN		
Petroleum Hydrocarbon	No PEL/TLV	Overexposure may cause: irritation to the eyes, skin, mucous membranes; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; potential occupational carcinogen.
Arsenic	0.010 mg/m ³	Arsenic can cause ulceration of the nasal septum, dermatitis, gastrointestinal disturbances, respiratory irritation, and hyperpigmentation of the skin. Suspected carcinogen.
Beryllium	0.002 mg/m ³	May cause irritation of the eyes and dermatitis. Chronic beryllium exposure may cause Berylliosis, the symptoms of which include anorexia, lassitude, chest pain, cough, clubbing of fingers, cyanosis, and pulmonary insufficiency. Suspected carcinogen.
Mercury	0.1 mg/m ³	Overexposure may cause irritation of the eyes and skin, cough, chest pain, dyspnea, bronchitis, pneumonitis, tremors, insomnia, irritability, indecision, headaches, lassitude, stomatitis, salivation, gastrointestinal disturbance, anorexia, and proteinuria.
Lead	0.05 mg/m ³	Overexposure may cause irritation to the nose, throat, and respiratory tract. Metallic taste may occur. Also may cause discoloration of skin and hair.
Polycyclic ^(b) Aromatic Compounds	0.2 mg/m ³	Can irritate eyes and skin. Toxic by ingestion, inhalation, or skin adsorption. Can cause headache, malaise, nausea, vomiting, abdominal pains, irritated bladder, profuse sweating, jaundice, hematuria, hemoglobinnuria, liver damage, convulsions, and coma.
DECONTAMINATION FLUIDS		
Isopropyl Alcohol	400 ppm	This product is an irritant of the eyes, nose, and throat. Overexposure can cause drowsiness and headache.
<p>(a) Permissible Exposure Limit (Occupational Safety and Health Administration) or Threshold Limit Value (American Conference of Governmental Industrial Hygienists) for time-weighted average exposure for an 8-hour workday or 40-hour workweek. When both Permissible Exposure Limits and Threshold Limit Values are available for a chemical, the lowest (i.e., most conservative) value is presented.</p> <p>(b) Polycyclic aromatic hydrocarbons as coal tar pitch volatiles.</p>		

TABLE 2 EMERGENCY TELEPHONE NUMBERS

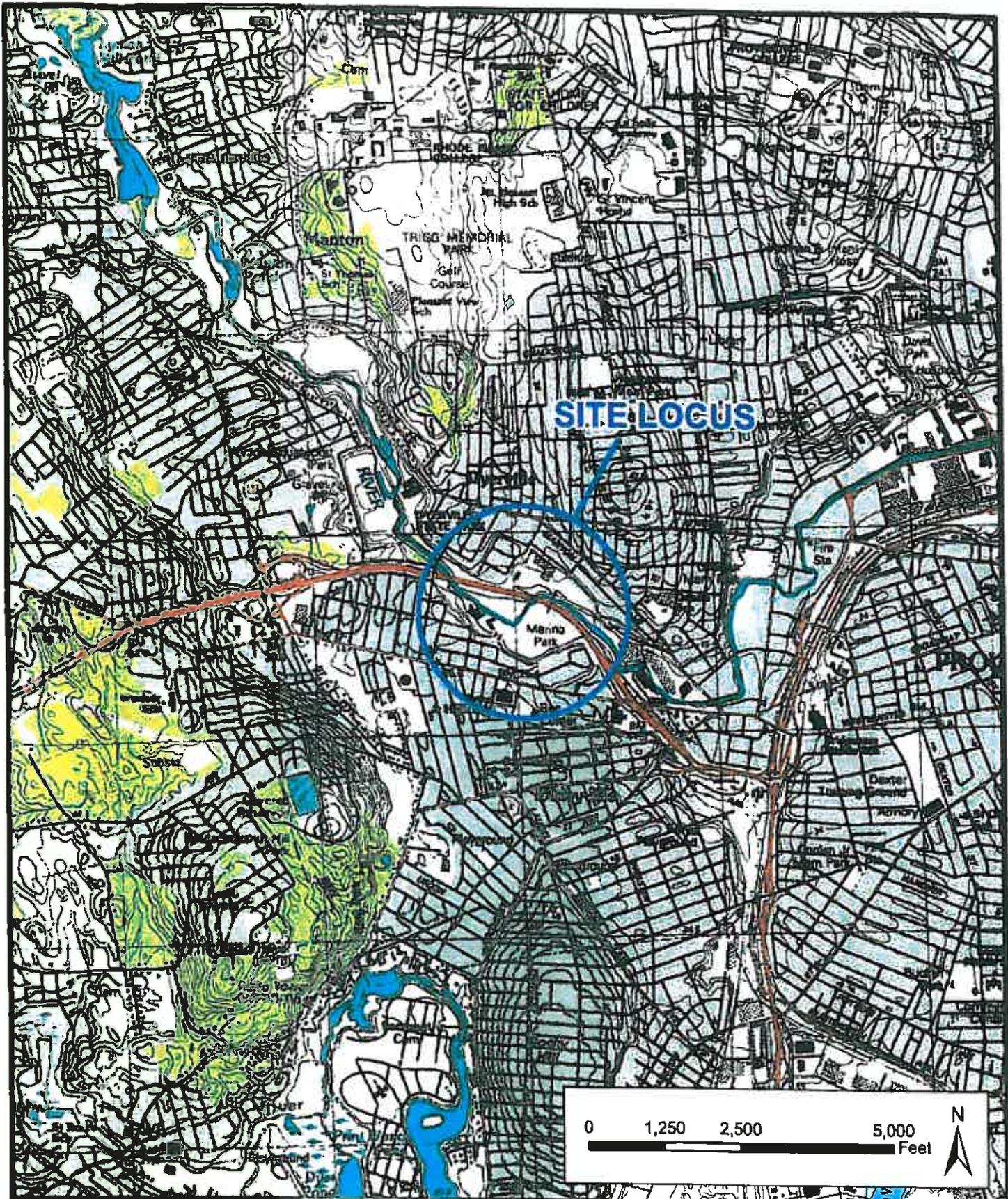
Title	Name	Telephone No.
OFFSITE EMERGENCY NUMBERS		
Police	Providence Police Department	911
Fire	Providence Fire Department	911
Ambulance	General Emergency 911	911
Hospital	Roger Williams Medical Center 825 Chalkstone Avenue Providence, RI 02908	(401) 444-4000
Directions to Hospital: Turn right on Barbara Street. Turn right at Glenbridge Avenue (0.1 mi). Turn right at Manton Avenue (0.4 mi). Turn left on Ortoleva Drive (141 ft). Turn right at Chalkstone Avenue (0.4 mi). Turn left at Navy Lane (1.2 mi). Turn right, hospital is on the left (817 ft). Total distance: 2.2 mi. Estimated travel time: 8 minutes.		
EA Emergency Numbers		
Program Manager	Richard Waterman	(401) 736-3440 (781) 254-1235
Project Manager	Frank Postma	(401) 736-3440 (443) 844-0007
Program Safety and Health Officer	Kris Hoiem	(410) 771-4950
Field Manager	Ronald Mack	(401) 736-3440 (508) 272-3069
Site Safety and Health Officer/Emergency Coordinator	Ronald Mack	(401) 736-3440 (508) 272-3069
Environmental Emergency Numbers		
Rhode Island Department of Environmental Management Project Manager	Timothy Fleury	(401) 222-2797
Rhode Island Department of Environmental Management Emergency Response	--	(401) 222-3070
Chemical Emergency Center (significant chemical leak or spill)	---	(800) 424-9300

TABLE 3 SITE CONTAMINANT MONITORING REQUIREMENTS

Task	Instrument	Frequency and Location	Action Levels ^(a)	Required Response
Intrusive work	PID	Initially during sampling. Intrusive work, and when excavation is started; every 30 minutes in the breathing zone	Background >Background to 5 ppm >5 ppm	Continue work. Evacuate to a safe upwind location and wait for levels to dissipate. Retest the area after 15 minutes. If levels have not dissipated, upgrade to Level C. Continue work in Level C personal protective equipment or retest in another 15 minutes. Evacuate to a safe upwind location immediately. Retest area after 15 minutes wearing Level C personal protective equipment. If sampling results defined by the photoionization detector have not dissipated in 30 minutes, contact the Program Safety and Health Officer and Project Manager for further guidance. Continue work
Intrusive work	CGI	Initially during intrusive work, and every 30 minutes of the excavation	2% >2% to 10% LEL > 10% LEL	Monitor continuously. Proceed with caution. Evacuate. Allow to dissipate prior to continuing work. Contact Program Safety and Health Officer and Project Manager.

(a) Action levels for PID are based upon unknown concentrations and measurements taken above background concentrations when background concentration is less than 1 ppm. When background concentrations exceed 1 ppm (total volatile hydrocarbons, PID action levels will be inclusive of background concentrations and so noted on the environmental monitoring record.

NOTE: PID = Photoionization detector
 CGI = Combustible Gas Indicator



LINCOLN LACE & BRAID
55 PONAGANSETT STREET
PROVIDENCE, RI

FIGURE 1
SITE LOCUS

PROJECT MGR: FBP	DESIGNED BY: RM	CREATED BY: PT	CHECKED BY: FBP	SCALE: AS SHOWN	DATE: APRIL 2010	PROJECT NO: 61891.05	FILE NO: LLB_LOCUS.MXD
---------------------	--------------------	-------------------	--------------------	--------------------	---------------------	-------------------------	---------------------------

4/14/2010



55 Ponagansett Ave, Providence, RI 02...
Directions to Roger Williams Medical Center
825 Chalkstone Avenue, Providence, RI 02908 - (401) 456-2000
2.5 mi – about 8 mins

Save trees. Go green!

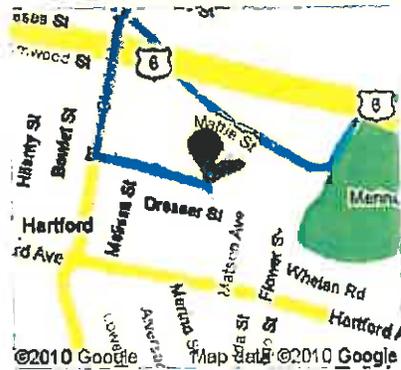
Download Google Maps on your phone at google.com/gmm



55 Ponagansett Ave, Providence, RI 02909

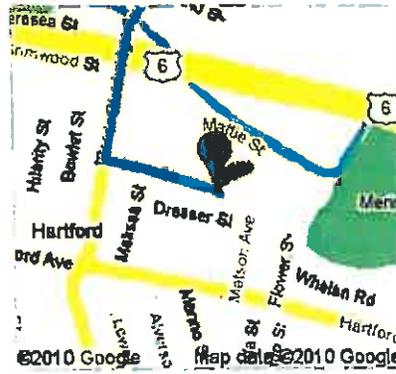
1. Head northwest on Ponagansett Ave toward Mattie St

go 59 ft
total 59 ft



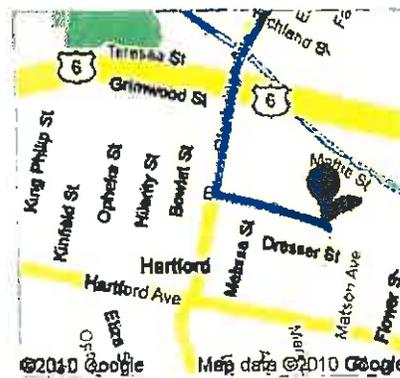
2. Continue onto Barbara St

go 0.1 mi
total 0.1 mi



3. Turn right at Glenbridge Ave
About 1 min

go 0.4 mi
total 0.5 mi



4/14/2010

55 Ponagansett Ave, Providence, RI 02...



4. Turn left at Manton Ave
About 1 min



go 0.2 mi
total 0.7 mi



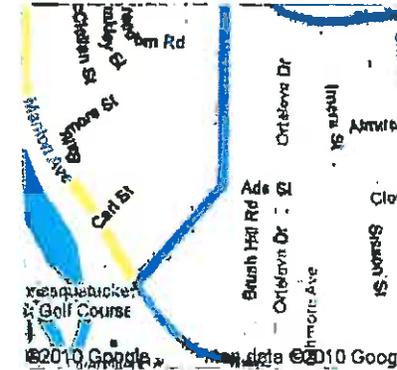
5. Turn right at Ridgeway Ave



go 0.2 mi
total 0.9 mi



6. Take the 2nd left onto Hillcrest Ave
About 1 min



go 0.3 mi
total 1.1 mi



7. Turn right at Chalkstone Ave
About 4 mins



go 1.4 mi
total 2.5 mi



Roger Williams Medical Center

825 Chalkstone Avenue, Providence, RI 02908 - (401) 456-2000

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2010 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left

Attachment A

**Safety, Health, and Emergency Response
Plan Review Record**

Attachment B
Site Entry and Exit Log

Attachment C

Accident/Loss and Incident Report



ACCIDENT/LOSS REPORT

THIS REPORT MUST BE COMPLETED BY THE INJURED EMPLOYEE'S SUPERVISOR AND FAXED TO EA CORPORATE HUMAN RESOURCES WITHIN 24 HOURS OF ANY ACCIDENT. THE FAX NUMBER IS (410) 771-1780.

NOTE: WHENEVER AN EMPLOYEE IS SENT FOR MEDICAL TREATMENT FOR A WORK-RELATED INJURY OR ILLNESS, PAGE 4 OF THIS REPORT MUST ACCOMPANY THAT INDIVIDUAL TO ENSURE THAT ALL INVOICES/ BILLS/ CORRESPONDENCE ARE SENT TO CORPORATE CENTER FOR TIMELY RESPONSE.

DATE OF ACCIDENT: _____ TIME OF ACCIDENT: _____
EXACT LOCATION WHERE ACCIDENT OCCURRED (including street, city, and state): _____

NAME OF INJURED EMPLOYEE: _____

HOMEADDRESS: _____

HOME PHONE: _____ DATE OF BIRTH: _____

AGE: _____ SEX: MALE FEMALE MARITAL STATUS: _____

SOCIAL SECURITY NUMBER: _____ DATE OF HIRE: _____

NUMBER OF DEPENDENTS: _____

EMPLOYEE JOB TITLE: _____

DEPARTMENT IN WHICH REGULARLY EMPLOYED: _____

EXPLAIN WHAT HAPPENED (include what the employee was doing at the time of the accident and how the accident occurred): _____

DESCRIBE THE INJURY AND THE SPECIFIC PART OF THE BODY AFFECTED (i.e., laceration, right hand, third finger, second joint): _____

OBJECT OR SUBSTANCE THAT DIRECTLY INJURED EMPLOYEE:

NAME AND ADDRESS OF THE PHYSICIAN (if medical attention was administered):

* PLEASE ATTACH THE PHYSICIAN'S WRITTEN RETURN TO WORK SLIP *

NOTE: A PHYSICIAN'S RETURN TO WORK SLIP IS REQUIRED PRIOR TO ALLOWING THE WORKER TO RETURN TO WORK.

IS THE EMPLOYEE EXPECTED TO LOSE AT LEAST ONE FULL DAY OF WORK?

WAS THE EMPLOYEE ASSIGNED TO RESTRICTED DUTY?

NUMBER OF DAYS AND HOURS EMPLOYEE USUALLY WORKS PER WEEK:

LIST ALL PPE EMPLOYEE WAS WEARING AND ALL SAFETY DEVICES IN USE AT THE TIME OF THE ACCIDENT:

DESCRIBE THE PREVENTIVE MEASURES TAKEN TO AVERT A RECURRENCE OF THIS TYPE OF INCIDENT:

DATE WHEN MEASURES WERE IMPLEMENTED AND BY WHOM:

AUTOMOBILE ACCIDENT INFORMATION

AUTHORITY CONTACTED AND REPORT NO.:

EA EMPLOYEE VEHICLE YEAR, MAKE, AND MODEL:

V.I.N.: _____

PLATE/TAG NO:

OWNER'S NAME AND ADDRESS:

DRIVER'S NAME AND ADDRESS:

RELATION TO INSURED: _____

DRIVER'S LICENSE NO.:

DESCRIBE DAMAGE TO YOUR PROPERTY:

DESCRIBE DAMAGE TO OTHER VEHICLE OR PROPERTY:

OTHER DRIVER'S NAME AND ADDRESS:

OTHER DRIVER'S PHONE:

OTHER DRIVER'S INSURANCE COMPANY AND PHONE:

LOCATION OF OTHER VEHICLE:

NAME, ADDRESS, AND PHONE OF OTHER INJURED PARTIES:

WITNESS

NAME: _____

PHONE:

ADDRESS:

STATEMENT:

SIGNATURE:

NAME: _____

PHONE:

ADDRESS:

STATEMENT:

SIGNATURE:

NAME OF SUPERVISOR:

DATE OF THIS REPORT: _____

REPORT PREPARED BY:

I have read this report and the contents as to how the accident/loss occurred are accurate to the best of my knowledge.

Signature: _____

Date:

Injured Employee



I am seeking medical treatment for a work related injury/illness.

Please forward all bills/invoices/correspondence to:

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

**Human Resources
11019 McCormick Road
Hunt valley, MD 21031**

**Tel: (410) 584-7000
Fax: (410) 771-1780**



INCIDENT REPORT

THIS REPORT IS TO BE COMPLETED WHEN A NEAR MISS OCCURS THAT COULD HAVE POTENTIALLY RESULTED IN SERIOUS PHYSICAL HARM. PLEASE FAX THIS FORM TO EA Program Safety and Health Office at (401) 771-4204, Attention Mr. Kris Hoiem.

EXPLAIN WHAT HAPPENED (include what the employee was doing at the time of the near miss and how it occurred):

REPORT PREPARED BY: _____

DATE:

APPENDIX D

Floodplain Calculations

Lincoln Lace and Braid Remediation Project
Remedial Action Work Plan
Floodplain Calculations
Appendix D

Cover System	A (sf)
CS1, total	51596
CS1, out floodplain	3100
CS1, in floodplain	48496
CS2, out floodplain	46755
CS3, total	36832
CS3, in floodplain	4385
CS4, total	10723
CS4, in floodplain	4550
CS5, in floodplain	18795
CS6, total	15916
CS6, in floodplain	5836
CS7, total	9561
CS7, in floodplain	4273

Parameter	Variable	Unit
Area	A	Square Feet
Volume	V	Cubic Feet, Cubic Yards
Depth	D	Feet, Inches

NOTES

- Cover System 1 (CS1) = Cut and 12" Cap
- Cover System 2 (CS2) = Fill from Floodplain and 12" Cap
- Cover System 3 (CS3) = 12" Cap Only
- Cover System 4 (CS4) = Bike Path
- Cover System 5 (CS5) = Sluiceway (6" Cap, crushed stone)
- Cover System 6 (CS6) = Riverbank (6" Cap)
- Cover System 7 (CS7) = Trees > 12" (6" Cap, crushed stone)

Determine Volume of Fill in Floodplain

Cover System	A (sf)	D _{cap} (ft)	V _{fill} (cf)	V _{fill} (CY)
CS1, in floodplain	48496	1	48496	1796
CS3, in floodplain	4385	1	4385	162
CS4, in floodplain	4550	1	4550	169
CS5, in floodplain	18795	0.5	9397	348
CS6, in floodplain	5836	0.5	2918	108
CS7, in floodplain	4273	0.5	2137	79

Total V_{fill} in Floodplain	2662
---	-------------

Determine Extra Depth to be Cut

Cover System	A (sf)	D _{cap} (ft)	V _{fill} (cf)	V _{fill} (CY)	D _{cut} in CS1 (ft) (V _{fill} /A _{CS1})	D _{cut} (in)
CS3, in floodplain	4385	1	4385	162	0.08	1.02
CS5, in floodplain	18795	0.5	9397	348	0.18	2.19
CS6, in floodplain	5836	0.5	2918	108	0.06	0.68
CS7, in floodplain	4273	0.5	2137	79	0.04	0.50

Total Extra D_{cut} into CS1	4.38
---	-------------

Determine Volume Cut in Floodplain

Cover System	A (sf)	D _{cut} (in)	D _{cut} (ft)	V _{cut} (cf)	V _{cut} (CY)
CS1, in floodplain	48496	16	1.33	64661	2395
CS4, in floodplain	4550	19	1.58	7204	267

Total V_{cut} in Floodplain	2662
--	-------------

Check Volume Removed from Floodplain Greater than Volume of Fill in Floodplain

$$V_{cut} \geq V_{fill}$$

$$2662 \geq 2662 \quad \checkmark$$