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Transmittal Letter

To: Mike Elliott	Date: March 12, 2015
U.S. Army Corps of Engineers, Regulatory Division	Client: Textron, Inc.
696 Virginia Road	Project: Former Gorham Manufacturing Facility
Concord, MA 01742-2751	Providence, RI
	AMEC Project No.: 3652-14-0032.02
Tel: 978-318-8131	Delivery: FedEx Delivery

☒ information	☐ purchasing	REMARKS: Enclosed please find one hard copy and CD containing the following report.
☐ estimating	☐ construction	**Section 404 Permit and supporting documents, Former Gorham Manufacturing Site, Parcel C and Parcel C-1 Phase II/III Areas, 425 (formerly 333) Adelaide Avenue Providence, Rhode Island, dated March 11, 2015** for the above referenced site.
☐ comments and/or approval	☐ see remarks	
		Please feel free to contact me if you have any questions regarding the
		enclosed materials supporting the 404 Permit Application and the Draft
		Remedial Action Work Plan under review with RIDEM.
		Prepared By: David Heislein

Number	Revision No.	No. of Copies	Title or Description
1	-	1	**Section 404 Permit and supporting documents, Former Gorham Manufacturing Site, Parcel C and Parcel C-1 Phase II/III Areas, 425 (formerly 333) Adelaide Avenue Providence, Rhode Island, dated March 11, 2015**
1	-	CD	**Section 404 Permit and supporting documents, Former Gorham Manufacturing Site, Parcel C and Parcel C-1 Phase II/III Areas, 425 (formerly 333) Adelaide Avenue Providence, Rhode Island, dated March 11, 2015**

Distribution: T = Transmittal Letter; C = Copy of Document

	T	C		T	C	
Greg Simpson, Textron	X	X				
Amec Foster Wheeler Project File	X					

Application for Authorization Under Department of the Army
Rhode Island General Permit Category 2

Mashapaug Pond Inner Cove Sediment Remediation
Former Gorham Manufacturing Facility
425 (Formerly 333) Adelaide Avenue
Providence, Rhode Island

Prepared for:
Textron, Inc.
40 Westminster Street
Providence, Rhode Island

Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
271 Mill Road
Chelmsford, MA 01824

Project No. 3652140032

March 11, 2015

1.0 Introduction

This submittal constitutes written request for authorization of the above-reference project under Department of the Army Rhode Island General Permit (GP) Category 2. Information is provided herein to support (a) Corps GP eligibility criteria and conditions, and (b) the Rhode Island Wetlands Rules application to alter a freshwater wetland (Rule 10.00).

The proposed project is the remediation of the Former Gorham Manufacturing Facility at 425 (formerly 333) Adelaide Avenue, Providence, RI (the Project). Figure 1 shows the site location on a USGS topographic base. The site is comprised of four parcels identified by work phase. This application applies to Project Phase II – Mashapaug Inner Cove, and Phase III – the northern portion of Parcel C-1, (see Figure 2). The project will result in unavoidable impacts to a shallow freshwater pond cove (2.8 acres) and the adjacent palustrine wetland (11,075 square feet or 0.254 acres), for a total of approximately 3 acres of wetland impacts. All impacts will be temporary, and wetlands will be restored in place, in accordance with GP conditions.

The Mashapaug Pond Inner Cove Sediment Remediation Project qualifies for coverage under the Department of the Army General Permit for the State of Rhode Island, Category 2 – Reporting/Application Required. The project meets the following category: I. Inland Waters and Wetlands (a) New fill/excavation discharges, category 2, paragraph 3. “Specific activities with impacts ≥5,000 SF required to effect the containment, stabilization, or removal of hazardous or toxic waste materials performed, ordered or sponsored by a government agency with established legal or regulatory authority. Wetlands must be restored in place.”

The project is exempt from state permitting under Rhode Island Wetlands Rules chapter 6.01 General Conditions for Exempt Activities, and 6.08 Site Remediation: "Activities which may affect freshwater wetlands and which are required by the Department for remediation of contamination resulting from releases of oil or hazardous materials are allowed in accordance with Rule 6.01…". All Rhode Island Wetlands Rules conditions for exempt projects will be met during performance of the work. The project is regulated by the Rhode Island Department of Environmental Management (RIDEM) Office of Waste Management as a remediation project, in consultation with the RIDEM Freshwater Wetland Program.

This application is made in lieu of direct application to the state with subsequent written authorization from the U.S. Army Corps of Engineers (the Corps) because a state application is not required. General Permit 2. B. Eligibility Criteria states "… Activities not regulated by the state or exempt from state regulation: The Corps, not the state, will issue the written authorization for such projects if they are eligible for the GP and they cannot be legally undertaken until the Corps approves them in writing."

2.0 Applicant Information

The applicant is:

Textron, Inc.
40 Westminster Street
Providence, RI.
Gregory Simpson
Senior Project Manager, Site Remediation

The authorized agent for the applicant is:

Amec Foster Wheeler
271 Mill Road
Chelmsford MA 01824
David E. Heislein
Senior Project Manager

The property owner is

City of Providence
Department of Planning and Development
444 Westminster Street, Suite 3A
Providence, RI
Robert Azar
Director of Current Planning

3.0 Project Overview

Site location:

Former Textron Gorham Manufacturing Facility
425 (Formerly 333) Adelaide Avenue
Providence RI
City of Providence Assessor's Plat 051, map 324

Latitude/Longitude 41.7965 / -71.4307

3.1 Background Information

The Site is the Former Gorham Manufacturing Facility at 425 (formerly 333) Adelaide Avenue, Providence RI (Figure 1). Site investigation activities conducted between 1986 and 2014 have identified metals, polynuclear aromatic hydrocarbons (PAHs), and dioxin in several media at the Site. The former manufacturing facility has been razed, remedial actions have been performed on parts of the Site, and redevelopment has also taken place on portions of the Site. The selected final remedy for the remaining areas includes capping Parcel C-1, removing up to two feet of sediment from the Inner Cove (Phase II Area), and then placing and capping the dewatered sediment on the Phase III Area Northeast Upland (Figure 2). The Inner Cove and the wetlands will be restored, and the relocated sediment to be placed in the former Carriage House Area of the Parcel C-1 Phase III Area will be capped. The final remedy also includes institutional controls in the form of an Environmental Land Usage Restriction (ELUR) that will incorporate Parcel C into a "Property-wide" ELUR to be implemented at the completion of the Property capping activities and Inner Cove sediment remediation. The project Remedial Action Work Plan provides a detailed description of the remediation project.

Investigations of surface water and sediment in Mashapaug Cove and adjacent wetlands and uplands, including Screening Level Ecological Risk Assessments (SLERA), have determined that soil and sediments have been impacted by the former site operations. Amec Foster Wheeler submitted the Final Site Investigation Report (SIR) on December 19, 2014 (AMEC, 2014). RIDEM issued a Program Letter approving of the Final SIR and proposed remedy on January 20, 2015. Remedial action is required to eliminate human health exposure and permit productive reuse of the Site.

3.2 Work Plan Summary

3.2.1 Inner Cove Sediment Removal

The proposed remediation of sediment in Mashapaug Pond Inner Cove will require temporarily damming and then dewatering and excavation in the dry of the contaminated sediment. Prior to dam installation and dewatering of the Inner Cove, a Wildlife Management Plan will be implemented to protect fish, amphibians, reptiles, and any freshwater mollusks that are observed to inhabit in the Inner Cove. The Wildlife Management Plan is provided as Attachment A.

A dam will be installed at the mouth of the Inner Cove where it meets the Outer Cove of Mashapaug Pond (Drawing C-102). Alternative dam configurations were evaluated and three commonly implemented designs are proposed: Aqua-Barrier®, sheet piles, and PortaDam®. The dam to be used will be determined by the selected contractor and will be presented within their construction plans submitted to RIDEM and the USACE prior to construction start.

Following the installation of the approved dam method, a pump system will be installed in the Inner Cove, with a piping system leading from the Inner Cove around the eastern side of the dam into the Outer Cove/Mashapaug Pond. Surface water sampling has determined that the water in the Inner Cove does not pose significant risk of harm. To prevent pumping of turbid water, the Inner Cove will be drained down to a depth of one foot deep. A splash block or turbidity curtain

will be installed in Mashapaug Pond at the discharge point to prevent scouring of the pond bottom. The remaining one-foot of water will be pumped to an upland area where it will be discharged into an infiltration gallery to contain the sediment particles for stabilization, consolidation and capping. Construction dewatering will then be conducted to gain access to the sediment within smaller defined cells. In order to remove potential sediment captured from the pumping of groundwater, construction dewatering will pass through a frac tank prior to discharge into the Outer Cove or may be discharged to an infiltration gallery located on the Phase III Area for infiltration on site.

Textron is also proposing to decrease the water level of Mashapaug Pond one to two feet to allow for reduced pumping and construction dewatering due to the decreased stage height, providing a more time- and cost-efficient method for Inner Cove dewatering, and also reduce the potential for a dam breach in the event of a large storm during the work. Lowering of Mashapaug Pond will be implemented during Inner Cove construction over a period of 4-6 weeks.

A temporary construction access road will be installed into the Inner Cove, splitting into separate roadways within the Cove, to provide excavating equipment access for work. The road will constitute temporary fill under the GP, with its footprint coincident with part of the remediation area, so temporary fill for access will not increase the area of wetland impact beyond that stated above. Heavy equipment operation in the drained cove will be minimized, and low ground pressure machinery will be used, and/or timber/swamp mats placed temporarily for machine support. Limited tree clearing will be conducted to support the removal of soil from the Inner Cove.

Treated effluent from the groundwater treatment system in Parcel A (Drawing V-101) and storm water from the large retail development and High School (Parcels A and B) currently discharge to a storm water detention basin north of the retail building on Parcel A. The storm water in the detention basin naturally infiltrates within the basin. However if the basin overflows, an outfall in the southwest corner of the detention basin will discharge excess flow to the Inner Cove. During Inner Cove construction, the overflow pipe will be plugged at the pipe inlet to prevent storm water from entering the Inner Cove. In the event of a major storm event such that the water level in the basin reaches the outfall pipe, the contractor will install a pump system in the detention basin to transfer the clean storm water to the Outer Cove.

Following construction of the access road including the installation of logging mats or approved equal, excavating equipment (restricted to the access road) will be used to remove up to two feet of contaminated sediment. The removed sediment will be piled along the access road to all the sediment to self-compress and drain much of the pore water back into the Inner Cove prior to soil removal from the Inner Cove. The sediment will then be placed in dump trucks, brought out of the Inner Cove, and deposited on a dewatering pad in the Phase III Area. The dewatering pad will be lined with an impermeable fabric and graded to a swale and pad in the corner of the gallery. The dewatering pad will be equipped with a sump to collect the pore water from the dewatered sediment. Sump water will be pumped to a treatment system in the Phase III Area. The water will pass through filter bags and two 50 gallon carbon filter drums. Following the water treatment, Amec Foster Wheeler will sample and characterize the water to be pumped into Mashapaug Pond to ensure it meets surface water discharge criteria.

The volume of sediment to be excavated is estimated at approximately 4500 cubic yards (CY). After the Inner Cove sediment is removed, dewatered, consolidated, and capped, sampling and survey will be performed to ensure the remedial goals have been met. The Inner Cove will then be restored by placement of a one-foot depth of clean imported soil.

After completion of the Inner Cove sediment removal and cap, the sump pumps will be removed to allow natural groundwater recharge of the Inner Cove. After the Inner Cove is recharged one to two feet, the dam will slowly be removed to minimize turbulence and allow the Inner Cove refill with pond water.

3.2.2 Palustrine Wetland and Upland Buffer Soil Capping

Results of the risk characterization on some soils in the vicinity of the Inner Cove Soil indicate that PAHs and several heavy metals in soil pose a risk of harm to human health. Soil in the palustrine wetland (RI "fringe wetland") and upland buffer (RI "perimeter wetland") will be capped with clean soil to prevent direct contact by humans. A permeable, high-visibility marker fabric will be placed over the compacted surface soil, and the marker will be overlain by 12 inches of clean, imported topsoil; the imported topsoil will be sampled to ensure it meets RIDEM Residential Direct Exposure Criteria. After clean soil capping, both of these areas will be restored by planting with native species (a description of the restoration is provided in Section 5 below).

4.0 Wetlands and Waters of the United States

The project site borders the northeastern shoreline of Mashapaug Pond. This application addresses anticipated impacts to (a) Mashapaug Inner Cove and (b) the adjacent palustrine wetland (and 50-foot buffer zone) proposed to result from hazardous waste site remediation. Figures V-101 through V-104 show the locations of the Inner Cove and wetlands. These are the jurisdictional resource areas that will be directly impacted by the project. Mashapaug Pond extends north and then lies to the west of the Inner Cove. Mashapaug Pond is the only other water of the U.S. in the project vicinity, and potential secondary impacts to it are addressed herein (Section 4.2.3).

Based on available data reviewed using the RIDEM Geographic Data Viewer and internet consultation with the U.S. Fish and Wildlife Service's New England Field Office, no state or federal listed endangered species are present at the Site.

4.1 Mashapaug Inner Cove

Mashapaug Pond is the largest freshwater body in the City of Providence, and is a shallow pond approximately 77 acres in area with surface elevation of 40 feet above mean sea level. A cove with an inner and outer section borders the Adelaide Avenue site. The Inner Cove will be impacted by the remediation project in the form of sediment removal and restoration.

Mashapaug Pond is located in a highly urbanized environment within the Pawtuxet River watershed (HUC 10: 0109000406), one of 64 ponds in this watershed. It is suitable for boating and other non-contact recreational activities, and is a non-flushing waterbody that receives input (including non-point-source pollutants and nutrients) from impervious areas and other surface runoff. The Pawtuxet River watershed is a subwatershed of the Narragansett Bay watershed (HUC 01090004) within the Massachusetts-Rhode Island Coastal Basin (HU 010900). Mashapaug Pond receives surface water inputs from surrounding developed land, and drains to the west, through an outfall at the southern end. During the summer months, aquatic vegetation is abundant in the Inner Cove and the water appears highly eutrophic.

In 2002, the Rhode Island Department of Environmental Management (RIDEM) and the Rhode Island Department of Health (RIDOH) issued a letter (RIDEM and RIDOH, 2002a) to inform the public that fish caught from Mashapaug Pond was not safe to eat due to contamination by polychlorinated biphenyls (PCBs), dioxins, and/or high bacteria levels, and that the pond was unsafe for direct contact and consumption. None of these conditions has been attributed to conditions at the Site itself or the former Gorham manufacturing facility (MACTEC, 2006b).

In 2006 RIDEM reclassified Mashapaug Pond (including the Inner and Outer Cove) from a Class C to a Class B surface water. Class B waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. These waters should be suitable for compatible industrial process and cooling, hydropower, aqua-cultural uses, navigation, and irrigation and other agricultural uses, and are expected to have good aesthetic value. In 2007, RIDEM published a Total Maximum Daily Load (TMDL) for dissolved oxygen (DO) and phosphorus for Mashapaug Pond. That report identified that the area surrounding Mashapaug Pond is entirely urban and that phosphorus loading at storm water discharge points and surface water runoff is causing low DO and growth of algal blooms that are hazardous to humans and aquatic organism. Neither DO nor phosphorus is related to the former Gorham manufacturing facility. Tributaries to Mashapaug Pond are Spectacle Pond (including runoff from Route 10), Mashapaug Brook, and six storm water discharge points.

Mashapaug Inner Cove consists of approximately 2.8 acres of open water, characterized as eutrophic, with a water column generally observed to be turbid with visibility to approximately one foot. Water depth in the Inner Cove is shallower than the rest of the pond. Bathymetric data collected in June 2006 and December 2011 show that the Inner Cove water depths average between 3 feet and 3.5 feet under high water conditions. Beyond the confines of the Inner and Outer Cove, water depth in Mashapaug Pond increases to approximately 10 feet to 11 feet.

The Inner Cove has a shallow flat bottom with water depths that range between 2.4 and 3.5 feet at locations greater than 20 feet from the shore. Inner Cove sediments consist of a very dark, organic silt layer in the top two to eight feet, underlain by sand. A soil boring extending through the bottom of the Inner Cove identified sand and gravel to a depth of approximately 38 feet. Bedrock was not encountered in the boring. The south shore of the Inner Cove contains silt and sand layers. The substrate along the shoreline is typically sand with a small proportion of gravel overlain by a thin (less than 1 inch) detrital layer. However, there are infrequent pockets where the detrital layer is several inches deep, especially in the center of the Inner Cove's shoreline.

Mashapaug Pond contains no emergent plant communities except in locations very close to shore during periods of floods or high water when the waterline rises to encompass terrestrial shoreline plants. Rooted vegetation consisting of water lilies (*Nymphaea odorata*) was observed in groupings in the Inner Cove. Submerged logs and branches were observed which create cover for fish habitat.

During the habitat assessment performed for the site risk characterization in 2007 water boatmen (*Cymatia* sp.), backswimmers (*Notonecta* sp.), and water striders (*Limnogonus fossarum*) were observed in the water column. Dragon fly and damselfly larvae (Odonata), amphipods, and oligocheates were identified in dip net samples collected from substrate in sandier areas. Amphipods, leaches, chironomids, and dragonfly larva were observed in the center of the shoreline among rooted vegetation and thicker detrital layer. Juvenile fish were observed along the shoreline, but could not be identified; fish observed jumping in the center of the Inner Cove

were tentatively identified as carp. No amphibians were observed and none were heard calling. Mallard ducks and a nesting pair of mute swans were observed foraging within the Inner and Outer Cove.

4.2 Palustrine Wetland

Mashapaug Inner Cove is bordered by a shallow footslope palustrine wetland (PFO/1B) approximately 11,075 square feet in area. The shoreline along Mashapaug Pond away from the Inner and Outer Cove is a moderate to steep slope away from the water's edge, and is characterized by a deciduous woodland community with signs of anthropogenic disturbance.

The wetland boundary extending from Adelaide Avenue to the northeast corner of the property was delineated by Vanasse, Hangin and Brustlin, Inc (VHB) in 2004 and the wetland bordering the Inner Cove delineation was updated by EA Engineering, Science, and Technology, Inc. in 2007. The vegetative community is dominated by small deciduous trees and shrubs including the tree species red maple (*Acer rubrum*), silver maple (*A. saccharinum*), black willow (*Salix nigra*), gray birch (*Betula populifolia*), and American elm (*Ulmus americana*), and the shrub species sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), red osier dogwood (*Cornus stolonifera*), buttonbush (*Cephalanthus occidentalis*), and arrowwood (*Viburnum dentatum*). The sparse herbaceous plant layer in the palustrine wetland contains sensitive fern (*Onoclea sensibilis*), blue flag iris (*Iris versicolor*), and poison ivy (*Toxicodendron radicans*). Soils are mapped by National Resources Conservation Service (NRCS) as Hinckley gravelly sandy loam. Soil observed on Site consisted of an organic horizon to 8 inches, underlain by a deep A horizon, both with matrix color 10YR2/1. Groundwater is shallow and appears at the surface at the edge of the Inner Cove. Hydrological indicators consist of water marks, drainage patterns, and oxidized root rhizospheres.

4.3 Upland Buffer

West and east of the Inner Cove, and south of the palustrine wetland bordering the Inner Cove, is a vegetated upland that serves as a wetland buffer. The 50-foot width of upland immediately upgradient of the cove and palustrine wetland is designated by the Rhode Island Wetlands Rules as a Perimeter Wetland.

The buffer to the wetland and Inner Cove consists of variably steep forested uplands with mature trees, a thin mixed herbaceous and woody understory, and patches of woody invasive species. The plant community includes oak species [white oak (Quercus alba), red oak (*Quercus rubrum*), black oak (*Quercus velutina*)], gray birch (*Betula populifolia*), black birch (*Betula lenta*), black cherry (*Prunus serotina*), mountain laurel (*Kalmia latifolia*), low-bush blueberry (*Vaccinium angustifolium*), huckleberry (*Gaylusaccia spp.*), ailanthus (*Ailanthus spp.*), oriental bittersweet (*Celastrus orbiculatus*), Japanese knotweed (*Fallopia japonica*), and honeysuckle (*Lonicera spp.*). The crowns of many of the mature trees are damaged from winter storms in recent years, indicating that the trees are more susceptible to other injury and likely have shortened expected life spans.

4.4 Functions & Values

Amec Foster Wheeler performed a functions and values assessment for the palustrine wetland and shallow Inner Cove in accordance with the Corps New England District guidance document "The Highway Methodology Workbook Supplement: Wetland Functions and Values – A

Descriptive Approach". This assessment is included in Attachment B. Wetland functions and values are an important part of Corps permitting decisions under Clean Water Act Section 404.

Functions are properties of a wetland that exist in the absence of society, and include processes involved in the self-maintenance of the wetland, and that relate a wetland to its surroundings. Functions are connected to the ecological significance of the wetland without regard to subjective human values. Values, in turn, are societal benefits derived from one or more functions or physical characteristics of a wetland. The value of a wetland is based on human judgment of the utility, quality, worth, or importance attributed to its functions. The Corps Regulatory Branch considers the following potential eight functions and five values (thirteen total) of wetlands as listed in The Descriptive Approach.

Functions

1. Groundwater Recharge/Discharge
2. Flood flow Alteration (Storage & Desynchronization)
3. Fish And Shellfish Habitat (Freshwater / Marine)
4. Sediment/Toxicant/Pathogen Retention
5. Nutrient Removal/Retention/Transformation
6. Production Export (Nutrient)
7. Sediment/Shoreline Stabilization
8. Wildlife Habitat

Values

1. Recreation (Consumptive and Non-Consumptive)
2. Educational/Scientific Value
3. Uniqueness/Heritage
4. Visual Quality/Aesthetics
5. Endangered Species Habitat

The Corps' Descriptive Approach was conducted in the following steps: using map research and observations from multiple field investigations, the evaluator determined the presence or absence of each of a list of considerations and qualifiers for the thirteen functions and values. The evaluator then determined what functions and values are principal (most important or of special value for that wetland) based on the dominant responses to the considerations and qualifiers for each function or value. A summary of the functions and values analysis is provided on the Wetland Functions and Values Analysis Evaluation Form contained in Attachment A.

The palustrine wetland adjacent to the southern shore of Mashapaug Inner Cove manifests the following three significant functions, and no significant values.

Sediment/toxicant/pathogen retention: This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas. Considerations / qualifiers applicable to this function of the wetland on Site consist of:

- Potential sources of excess sediment are in the watershed above the wetland
- Potential or known sources of toxicants are in the watershed above the wetland
- Fine grained mineral or organic soils are present
- The wetland edge is broad and intermittently aerobic

Nutrient removal/retention/transformation: This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries. Considerations / qualifiers applicable to this function of the wetland on site consist of:

- Overall potential for sediment trapping exists in the wetland
- Potential sources of excess nutrients are present in the watershed above the wetland
- Wetland saturated for most of the season. Ponded water is present in the wetland.
- Deep organic/sediment deposits are present
- Slowly drained fine grained mineral or organic soils are present

Sediment/shoreline stabilization: This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion. Considerations / qualifiers applicable to this function of the wetland on site consist of:

- Indications of erosion or siltation are present
- Topographical gradient is present in wetland
- Potential sediment sources are present up-slope

These three functions will be restored upon completion of the remediation project. Restoration is described in Section 5.0 below.

4.5 Avoidance and Minimization

The proposed impacts to both Mashapaug Inner Cove and the adjacent palustrine wetland are necessary to remediate soil and sediment impacted by historic site activities. The project has avoided wetland impact to the extent possible by limiting sediment removal to the Inner Cove and adjacent wetlands, because risk characterization has determined that remedial actions are warranted in these areas, but not warranted in the Outer Cove or greater Mashapaug Pond.

Adverse impacts to jurisdictional wetlands and waters will be minimized by the following factors:

- construction will be performed in the Inner Cove in non-inundated conditions;
- a wildlife management plan will be implemented prior to and during construction to avoid and minimize wildlife impacts;
- all wetlands and waters will be restored to current conditions to the extent possible, and environmental conditions will be improved by the removal or isolation of contaminated materials.

4.6 U.S. Army Corps of Engineers General Conditions

All considerations and general conditions of the Department of the Army Rhode Island General Permit (GP) will be met by this project. Please note the following considerations in particular.

Secondary and cumulative impacts have been evaluated based on identified waters of the U.S. on the property and known waters adjacent to the property. One water of the U.S. is located on and near the Site: Mashapaug Pond (Figure 1). A secondary impact to Mashapaug Pond will result from the pond lowering in advance of Inner Cove dewatering. This impact will be temporary. Lowering of the pond is anticipated to result in temporary exposing of pond bank (soils and

vegetation) around the entire pond perimeter, and will reduce the volume of Mashapaug by approximately 10.2 percent. The lowering of the pond elevation will provide additional water storage while the Inner Cove is dammed and dewatered to provide storage during a potential rain event. These impacts will last approximately 4-6 weeks, after which time the pond will be allowed to fill by normal precipitation and surface water inputs.

No cumulative adverse impacts are anticipated to result from the project.

5.0 Wetland Restoration

5.1 Inner Cove

The Inner Cove will be restored by placement of a one-foot depth of clean imported soil. This restoration will leave the cove bottom elevation approximately one foot deeper than will have existed prior to the remediation (approximately two feet of impacted sediment will be removed). Only one foot of replacement soil is proposed because the pond bottom sediments currently in place include several inches to feet of organic muck that has accumulated in the Inner Cove in part due to eutrophic conditions and lack of significant water flux in the Inner Cove. The replacement soil is intended to mimic the bottom conditions in the Outer Cove. The Inner Cove will slowly receive organic matter input after remediation, and an organic-rich muck bottom may re-develop naturally.

5.2 Palustrine Wetland Bordering Inner Cove (RI "Fringe Wetland")

The vegetated palustrine (fringe) wetland extends up to approximately 10 feet from the water's edge around the Inner Cove and Outer Cove (Drawing C-102). The approximately 11,000-square foot wetland area is presently vegetated with herbaceous plants, shrubs, and some trees. Dominant species, as described above in Section 4.2, include red maple (*Acer rubrum*), silver maple (*A. saccharinum*), black willow (*Salix nigra*), gray birch (*Betula populifolia*), and American elm (*Ulmus americana*), and the shrub species sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), red osier dogwood (*Cornus stolonifera*), buttonbush (*Cephalanthus occidentalis*), and arrowwood (*Viburnum dentatum*). The sparse herbaceous plant layer in the palustrine wetland contains sensitive fern (*Onoclea sensibilis*), blue flag iris (*Iris versicolor*), and poison ivy (*Toxicodendron radicans*).

Only limited site grading will be performed within the palustrine wetland area. To minimize damage to existing vegetation, a variable thickness layer of organic-rich soil will be placed by hand over the entire palustrine wetland from the existing ground surface to a depth of several inches, with a maximum thickness of 12 inches. Compost will be used to amend the soil cover material to achieve an organic content of approximately 20%. This thickness of soil is proposed in order to maintain wetland hydrology, but still provide a physical barrier to impacted soil until vegetation becomes well-established. The soil thickness will be determined in the field to match the existing contours, and the contours of organic-rich soil to be placed off shore (below water level) within the Inner Cove shoreline. Soil will be tapered to a minimum around existing large woody vegetation to maintain the health of existing plants where possible.

All occurrences of the non-native invasive species purple loosestrife, previously observed on the site, will be mechanically removed prior to soil placement.

A seed mixture of native New England wetland species including sedges, other graminoids, and herbaceous species with wetland indicator status from obligate to facultative will be hand-spread over the emplaced soil to ensure thorough and even coverage. The seed mixture will be the New England Wetland Plants "Wetmix" or similar approved mixture with a range of wetland indicators to promote local establishment of species best suited to the varied hydrology and microtopography expected to result after soil placement.

The following woody species are proposed for installation after soil placement:

- greenbrier (*Smilax rotundifolia*)
- blackberry (*Rubus* spp.)
- highbush blueberry (*Vaccinium corymbosum*)
- red osier dogwood (*Cornus sericea*)
- sweet pepperbush (*Clethra alnifolia*)
- black willow (*Salix nigra*)
- red maple (*Acer rubrum*)

Plants will be installed only within approximately four feet of the water's edge, with an average spacing of four feet on center, placed in clusters. This dense planting is required to aid in resisting incursion by invasive species and create thickets to prevent access to the water's edge by trespassers. These native species were selected based on one or more of the following characteristics: rapid growth rate, wildlife habitat value, presence in the native community at the site, and tendency to form dense thickets. These species will minimize soil erosion and provide for the establishment of a dense community that will resist incursion by non-native invasive species. As a collateral benefit, greenbrier, swamp rose, and blackberry species have been specified because of their thorns/spines and propensity to form shrub thickets, which will serve as a barrier to human access to this area.

5.3 Upland Buffer Zone (Rl "Perimeter Wetland")

The buffer zone to the palustrine wetland and the Inner and Outer Coves (Drawing C-102) consists of variably steep forested uplands with mature trees, a thin mixed herbaceous and woody understory, and patches of woody invasive species. As noted above, the plant community includes oak species (white, red, black), gray birch, black birch, black cherry, mountain laurel, low-bush blueberry, huckleberry, ailanthus, oriental bittersweet, Japanese knotweed, and honeysuckle. The crowns of many of the mature trees are damaged, indicating that these trees are more susceptible to other injury and likely have shortened expected life spans.

To restore the area, grading for slope stabilization (maximum 3:1 slope) will be implemented within the buffer zone where needed, and damaged trees will be removed prior to grading to facilitate soil placement. A permeable fabric warning barrier and a one-foot thick soil cover will be placed to serve as a physical barrier to underlying impacted soils. Some trees and shrubs may require removal to allow equipment access and soil cover placement; however, viable trees and shrubs will be saved where possible. All invasive species will be eradicated by hand-pulling, or by cutting and treating with an herbicide by stump application prior to placement of the soil cover (see Invasive Species Control Plan, Attachment C).

To stabilize the soil cap and to rapidly restore the vegetated community impacted by the cap, the seed mix "New England Erosion Control/Restoration Mix for Dry Sites" or a similar mixture will be spread over the emplaced soil using a hydroseeding method, which includes a hydromulch with

a tackifier. The seed mix selected contains native New England herbaceous species grasses to ensure that dry or recently disturbed sites will be quickly re-vegetated and the soil surface stabilized.

Viable trees and woody shrubs remaining in the buffer zone will be amended by planting a select list of native species including:

- red osier dogwood (*Cornus sericea*)
- sweet pepperbush (*Clethra alnifolia*)
- black willow (*Salix nigra*)
- red maple (*Acer rubrum*)

Planting emphasis will be placed on areas where existing vegetation is sparse and areas where vegetation has been damaged or removed by the site grading and soil placement process. These native species were selected based on their wildlife habitat value, their presence in the existing community, and/or their ability to grow and thrive in a disturbed area. Plants will be installed randomly in clusters, with an average spacing of eight feet on center.

5.4 Monitoring

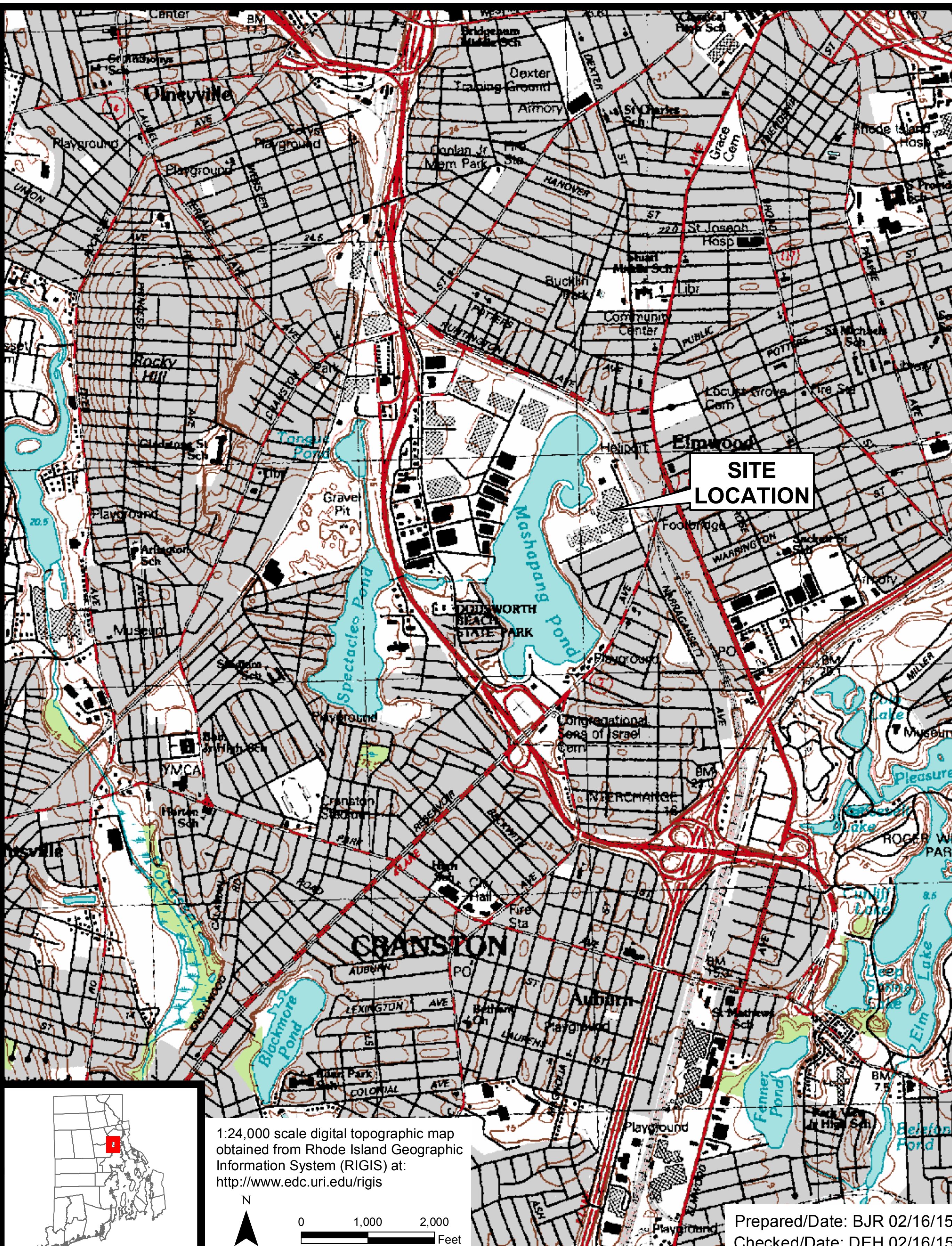
All temporarily impacted areas: Mashapaug Pond Inner Cove; The restored palustrine wetland; and upland buffer will be monitored for performance standards to include the minimum 80% vegetation coverage in the fringe wetland and perimeter wetland; successful establishment of species with a wetland indicator status of facultative, facultative-wetland, or obligate within the fringe wetland; and absence of invasive species. These areas will be monitored twice annually for one full growing season for plant health, evidence of soil erosion, and for the presence of non-native invasive species. If such species are observed in the completed work areas, specimens will either be hand-pulled by the inspector, or a control plan instituted to remove the(s) species. An Invasive Species Control Plan is provided as Attachment C.

The restored wetland and the adjacent upland buffer (50 feet from water/wetland edge) will be designated a no-cut zone that will be allowed to re-vegetate naturally. It will not be mowed, cut, or managed in any way with the possible exception of invasive species management if needed. This will include the Parcel C-1 Phase I Area that was completed in 2012.

6.0 Related Permits and Approvals

The project is directly regulated by the RIDEM Office of Waste Management as a remediation project, in consultation with the RIDEM Freshwater Wetland Program and Water Resources Program.

Water Quality Certification under Section 401 of the Clean Water Act (33 USC 1341) has been conditionally granted by RIDEM for GP Category 2 activities provided that the applicant obtains required state and local approvals, and that RIDEM finds that the activity is likely to have minimal or no impact on water quality. Indeed, the project is being undertaken as a resource improvement under the Rhode Island Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases.



Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, RI

amec foster wheeler

Site Location Map

Project 3652-14-0032

Figure 1

Document: P:\old_Wakefield_Data\projects\TEXTRON\GORHAM\GIS\MapDocuments\RAWP - Phase II\SiteLocationMap.mxd PDF: P:\BOS\Textron\3652140032 - Textron Gorham Remediation\8.0 Proj Deliverables\8.2 Work Plans\Figure 1 - Site Locus.pdf

Buffer Zone (RI Perimeter Wetland)
12 inch soil cap over marker fabric
seed and hydromulch
woody plants, limited clearing

Mashapaug Pond

Mashapaug Outer Cove

Amtrak

Railroad Tracks

Sewer Easement

Former Carriage House Area - Inner Cove Sediment Placement

Access Road

City Sewer Easement

Phase III

Parcel C-1

Detention Basin

Inner Cover
Dredge -2 feet
place sand +1 foot
1-2 feet organics soil within 10 feet of shore

Mashapaug Inner Cove

Phase II

Parcel A
Retail

Palustrine Wetland (RI Fringe Wetland)
up to 12 inch topsoil
seed mix
shrubs

Phase I

Parking Lot

Phase I

Parcel B
High School

Parcel C
Planned Parcel C Fields

Adelaide Avenue

Crescent Street

Legend

- Phase III Perimeter Wetland 12" Soil with Geofabric, Limited Clearing of Brush
- Phase I Soil Cap with Geofabric Completed Nov. 2012
- 12" Soil Cap with Geofabric
- Approximate Easement
- Approximate Parcel Boundary
- Elevation

Prepared/Date: BJR 3/11/15
Checked/Date: SH 3/11/15

N

0 75 150 Feet

Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, RI

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Parcel C Planned Remediation

Project 3652-14-0032

Figure 2

Document: P:\old_Wakefield_Data\projects\TEXTRON\GORHAM\GIS\MapDocuments\RAWP - Phase III\Figure 2 - Parcel C Planned Remediation.mxd PDF: P:\old_Wakefield_Data\projects\TEXTRON\GORHAM\GIS\Figures\Figure 2 - Parcel C Planned Remediation.pdf

Attachment A
Wildlife Management Plan
Former Gorham Manufacturing Site
333 Adelaide Ave.
Providence, RI

Introduction

Textron presents this work plan for managing aquatic wildlife during remedial activities within the Mashapaug Inner Cove at the former Gorham Manufacturing Site, 333 Adelaide Avenue, Providence RI (See Figure 9). Per the Rhode Island Department of Environmental Management's Rules and Regulations Governing the Administration and Enforcement of the Fresh Water Wetlands Act Rule 10.a, Wildlife and Wildlife Habitat, wetlands serve as an important function for wildlife and wildlife habitat. The objectives of this plan are to provide the methods for the management and treatment of wildlife in the Mashapaug Pond Inner Cove slated for remediation. The proposed remediation of sediment will require the installation of a temporary dam at the mouth of the Inner Cove, dewatering, and excavation in the dry of contaminated sediment, followed by restoration. The Wildlife Management Plan outlines the steps needed to protect fish, amphibians, reptiles and any freshwater mollusks that are known to occur in the Cove. This work plan will identify the sequence of steps to relocate fish and other aquatic wildlife from areas of the Inner Cove to Mashapaug Pond focusing on non-lethal means to relocate wildlife. However, it is important to recognize that some mortality to fish and aquatic wildlife may occur despite the contractors best efforts. No threatened or endangered species are known to be present within the Project vicinity.

Site Description and Overview

The former Gorham Manufacturing Facility (the Site) is situated on a 37 acre parcel at 333 Adelaide Avenue in Providence, Rhode Island. Between 1890 and 1985, sterling silver and plated silverware, as well as bronze castings, were manufactured on-site. Based on multiple investigations of surface water and sediment of Mashapaug Inner and Outer Cove, including several Screening Level Ecological Risk Assessments (SLERA), Amec Foster Wheeler determined that the sediments in the Inner Cove are impacted and remedial action is required in order to eliminate human health and ecological risks from contamination and create productive reuse of the Site.

Mashapaug Pond is a Class B fresh water lake, and its applicable designated uses are primary and secondary contact recreation and fish and wildlife habitat (RIDEM, 2009). The Inner Cove consists largely of open water, approximately 2.8 acres in area and 3-4 feet in depth, and is characterized as highly eutrophic. It has been determined that when remediation of sediments in the Inner Cove is complete, there will be reduced risk to ecological receptors throughout Mashapaug Pond and the surrounding area.

Wildlife management and monitoring will take place prior to, and throughout remediation activities at the Mashapaug Inner Cove and Pond during the dewatering of Mashapaug Inner Cove. No threatened or endangered species are known to be present within the Project vicinity. A combination of methods for removing aquatic wildlife will be used prior to and during dewatering of the cove, including a technique using seine nets and noise makers to herd fish, as well as capturing and manually transporting wildlife. Best professional judgment will be used in determining sequence of activities, best management practices and safety in handling and transporting wildlife.

Wildlife Habitat Assessment

The main habitat of concern during remedial activities and dewatering of the Inner Cove is the aquatic environment. The RIDEM Geographic Data Viewer was used to determine the presence of rare species habitat. Based on the available maps, no rare species habitat were identified in the vicinity of the project site. On June 20, 2006, a MACTEC biologist visited Mashapaug Cove and Mashapaug Pond to conduct a reconnaissance level habitat assessment. During the field visit mammals, birds, herptiles, and benthic organisms observed by direct observation (sight) or tracks were recorded. Juvenile fish were observed along the shoreline, but could not be identified, and fish observed jumping in the center of the Cove were tentatively identified as carp. No amphibians were observed and none were heard calling. Mallard ducks, as well as one of the nesting pairs of swans were observed foraging within the Inner and Outer Cove.

Conceptual Plan and Methodology

Fish herding will be used prior to dewatering of the Inner Cove and before the temporary dam is constructed to herd fish into the Mashapaug Outer Cove. This method will involve a seine net; a fine mesh net with weights at the bottom and floats at the top which is positioned vertically in the water column. Methods which may increase effectiveness and/or efficiency include conducting seining operations at dawn or dusk (i.e., during low-light conditions). Small mesh sizes will be used as they are more effective across the full range of fish size (and age class). An underwater noise maker, such as a sopras sub underwater air signal or equivalent may also be used to help herd fish towards the Outer Cove prior to the use of the seine net. The seine net will extend from the eastern bank of the Inner Cove peninsula to the southeastern corner of the Inner Cove. The southern end of the seine net will be moved westerly to reach the tip of the western bank of the peninsula separating the Inner and Outer Cove. If it is found that debris at the bottom of the Inner Cove hinders this approach the alternative method is to place multiple noise makers around the southern bank of the Inner Cove beginning at dawn for half a day in order to scare wildlife away from the Inner Cove.

Once fish have been herded out of the Inner Cove, the seine net will be held in place within the Outer Cove, north of the proposed temporary dam. The dam will then be installed between the two peninsulas between the Inner and Outer Cove (Figure 9). Pumps will be placed in the Inner Cove to begin dewatering the area. To avoid entrainment, impingement, or injury to any remaining fish or other aquatic wildlife, and to avoid contaminated sediment, the pump intakes will be placed just below the water surface, pumping at approximately 0.5 feet/second velocity. A screened structure will surround the water intake structures with an approximate 1-2” mesh size. The intake screen shall be monitored during operations to ensure that the screening has not collapsed and that there are no openings or blockage.

Once the Inner Cove has been pumped down so that one foot of water remains the area will be monitored for any remaining aquatic fauna. Any existing fauna will be transported in 5-gallon buckets or other suitable containers outside of the excavation area and to inundated areas of Mashapaug Pond. Best professional judgment and safe handling practices will be used in properly transporting wildlife. The remaining water will be pumped out for groundwater treatment and discharge into the Outer Cove, and sump pumps will be used to maintain a depressed water table below the depth of sediment removal. Sediment removal will be completed and the Inner Cove and fringe wetlands restored.

If mute swans are found to be nesting they will need to be removed due to their aggressive nature and threat to worker safety. Mute Swans are an invasive species that displace native wildlife and deplete the aquatic vegetation that is habitat and food for other wildlife. Preliminary investigation in the spring before the start of the project will determine if mute swans appear to

be nesting in the area and proper methods will be taken. Lethal action may be required and/or addling of eggs to prevent hatching. It is best to addle eggs and place them back in the nest to insure the female will not lay more eggs.

After completion of the Inner Cove sediment removal and restoration, the sump pumps will be removed to allow natural groundwater recharge of the Inner Cove. After the Inner Cove is recharged two to three feet, the dam will slowly be removed in order to let the Inner Cove refill without turbulence, preventing erosion or scour. The process in which this is done is dependent on the type of dam used and the manufacturer's removal guidelines. Wildlife habitat will then be allowed to naturally re-populate the Inner Cove.

Functions and Values Assessment
Palustrine Wetland Adjacent to Mashapaug Pond Inner Cove

	CONSIDERATIONS/QUALIFIERS FOR WETLAND FUNCTIONS OR VALUES	PFO/1B
	Groundwater Recharge/Discharge— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either	
1	Public or private wells occur downstream of the wetland	No
2	Potential exists for public or private wells downstream of the wetland	No
3	Wetland is underlain by stratified drift	No
4	Gravel or sandy soils present in or adjacent to the wetland	Yes
5	Fragipan does not occur in the wetland	No
6	Fragipan, impervious soils, or bedrock does occur in the wetland	No
7	Wetland is associated with a perennial or intermittent watercourse	No
8	Signs of groundwater recharge are present or piezometer data demonstrates recharge	No
9	Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet	No
10	Wetland contains only an outlet, no inlet	No
11	Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards	No
12	Quality of water associated with the wetland is high	No
13	Signs of groundwater discharge are present (e.g. springs)	No
14	Water temperature suggests it is a discharge site	No
15	Wetland shows signs of variable water levels	No
16	Piezometer data demonstrates discharge	NA
17	Other	NA
	Function Present ?	**No**
	FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas	
1	Area of this wetland is large relative to its watershed	No
2	Wetland occurs in the upper portions of its watershed	No
3	Effective flood storage is small or non-existent upslope of or above the wetland	Yes
4	Wetland watershed contains a high percent of impervious surfaces	Yes
5	Wetland contains hydric soils which are able to absorb and detain water	Yes
6	Wetland exists in a relatively flat area that has flood storage potential	Yes
7	Wetland has an intermittent outlet, ponded water, or signs are present of variable water level	No
8	During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions	No
9	Wetland receives and retains overland or sheet flow runoff from surrounding uplands	Yes
10	In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse	No
11	Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland	No
12	The watershed has a history of economic loss due to flooding	No
13	This wetland is associated with one or more watercourses	No
14	This wetland watercourse is sinuous or diffuse	No
15	This wetland outlet is constricted	No
16	Channel flow velocity is affected by this wetland	No
17	Land uses downstream are protected by this wetland	No
18	This wetland contains a high density of vegetation	No
19	Other	NA

	Function Present ?	**No**
	FISH AND SHELLFISH HABITAT (FRESHWATER) — This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.	
1	Forest land dominant in the watershed above this wetland	No
2	Abundance of cover objects present	Yes
	STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE	
3	Size of this wetland is able to support large fish/shellfish populations	
4	Wetland is part of a larger, contiguous watercourse	
5	Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter	
6	Stream width (bank to bank) is more than 50 feet	
7	Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations	
8	Streamside vegetation provides shade for the watercourse	
9	Spawning areas are present (submerged vegetation or gravel beds)	
10	Food is available to fish/shellfish populations within this wetland	
11	Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland	
12	Evidence of fish is present	
13	Wetland is stocked with fish	
14	The watercourse is persistent	
15	Man-made streams are absent	
16	Water velocities are not too excessive for fish usage	
17	Defined stream channel is present	
18	Other	
	Function Present ?	**No**
	SEDIMENT/TOXICANT/PATHOGEN RETENTION — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas.	
1	Potential sources of excess sediment are in the watershed above the wetland	Yes
2	Potential or known sources of toxicants are in the watershed above the wetland	Yes
3	Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland	No
4	Fine grained mineral or organic soils are present	Yes
5	Long duration water retention time is present in this wetland	No
6	Public or private water sources occur downstream	No
7	The wetland edge is broad and intermittently aerobic	Yes
8	The wetland is known to have existed for more than 50 years	NA
9	Drainage ditches have not been constructed in the wetland	Yes
	STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE	
11	Wetland is associated with an intermittent or perennial stream or a lake	
12	Channelized flows have visible velocity decreases in the wetland	
13	Effective floodwater storage in wetland is occurring. Areas of impounded water are present.	
14	No indicators of erosive forces are present. No high water velocities are present.	
15	Diffuse water flows are present in the wetland	
16	Wetland has a high degree of water and vegetation interspersion	
17	Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present	
18	Other	
	Function Present ?	**Yes**

	NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.	
1	Wetland is large relative to the size of its watershed	No
2	Deep water or open water habitat exists	Yes
3	Overall potential for sediment trapping exists in the wetland	Yes
4	Potential sources of excess nutrients are present in the watershed above the wetland	Yes
5	Wetland saturated for most of the season. Ponded water is present in the wetland.	Yes
6	Deep organic/sediment deposits are present	Yes
7	Slowly drained fine grained mineral or organic soils are present	Yes
8	Dense vegetation is present	No
9	Emergent vegetation and/or dense woody stems are dominant	Yes
10	Opportunity for nutrient attenuation exists	Yes
11	Vegetation diversity/abundance sufficient to utilize nutrients	No
	STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE	
12	Waterflow through this wetland is diffuse	
13	Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation	
14	Water moves slowly through this wetland	
15	Other	
	Function Present ?	**Yes**
	PRODUCTION EXPORT (Nutrient) — This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms	
1	Wildlife food sources grow within this wetland	No
2	Detritus development is present within this wetland	Yes
3	Economically or commercially used products found in this wetland	No
4	Evidence of wildlife use found within this wetland	Yes
5	Higher trophic level consumers are utilizing this wetland	NA
6	Fish or shellfish develop or occur in this wetland	NA
7	High vegetation density is present	No
8	Wetland exhibits high degree of plant community structure/species diversity	No
9	High aquatic vegetative diversity/abundance is present	No
10	Nutrients exported in wetland watercourses (permanent outlet present)	Yes
11	“Flushing” of relatively large amounts of organic plant material occurs from this wetland	No
12	Wetland contains flowering plants that are used by nectar-gathering insects	No
13	Indications of export are present	No
14	High production levels occurring, however, no visible signs of export (assumes export is attenuated)	No
15	Other	
	Function Present ?	**No**
	SEDIMENT/SHORELINE STABILIZATION — This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion	
1	Indications of erosion or siltation are present	Yes
2	Topographical gradient is present in wetland	Yes
3	Potential sediment sources are present up-slope	Yes
4	Potential sediment sources are present upstream	NA
5	No distinct shoreline or bank is evident between the waterbody and the wetland or upland	No
6	A distinct step between the open waterbody or stream and the adjacent land exists (ie, sharp bank) with dense roots throughout	No
7	Wide wetland (>10’) borders watercourse, lake, or pond	Yes
8	High flow velocities in the wetland	No
9	The watershed is of sufficient size to produce channelized flow	No
10	Open water fetch is present	Yes

11	Boating activity is present	Yes
12	Dense vegetation is bordering watercourse, lake, or pond	Yes
13	High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond	Yes
14	Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet)	Yes
15	Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events	No
16	Other	
	Function Present ?	**Yes**

	WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.	
1	Wetland is not degraded by human activity	No
2	Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards	No
3	Wetland is not fragmented by development	Yes
4	Upland surrounding this wetland is undeveloped	No
5	More than 40% of this wetland edge is bordered by upland wildlife habitat (eg, brushland, woodland, active farmland, or idle land) at least 500 feet in width	Yes
6	Wetland is contiguous with other wetland systems connected by a watercourse or lake	No
7	Wildlife overland access to other wetlands is present	No
8	Wildlife food sources are within this wetland or are nearby	No
9	Wetland exhibits a high degree of interspersion of vegetation classes and/or open water	Yes
10	Two or more islands or inclusions of upland within the wetland are present	No
11	Dominant wetland class includes deep or shallow marsh or wooded swamp	No
12	More than three acres of shallow permanent open water (less than 6 feet deep), including streams in or adjacent to wetland, are present	No
13	Density of the wetland vegetation is high	No
14	Wetland exhibits a high degree of plant species diversity	No
15	Wetland exhibits a high degree of diversity in plant community structure (eg, tree/ shrub/vine/grasses/mosses)	Yes
16	Plant/animal indicator species are present (List species for project)	No
17	Animal signs observed (tracks, scats, nesting areas, etc)	Yes
18	Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons	No
19	Wetland contains or has potential to contain a high population of insects	Yes
20	Wetland contains or has potential to contain large amphibian populations	No
21	Wetland has a high avian utilization or its potential	No
22	Indications of less disturbance-tolerant species are present	No
23	Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources, etc)	No
24	Other	
	Function Present ?	**No**

	RECREATION (Consumptive and Non-Consumptive) — This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland.	
1	Wetland is part of a recreation area, park, forest, or refuge	No
2	Fishing is available within or from the wetland	No
3	Hunting is permitted in the wetland	No
4	Hiking occurs or has potential to occur within the wetland	No
5	Wetland is a valuable wildlife habitat	No

6	The watercourse, pond, or lake associated with the wetland is unpolluted	No
7	High visual/aesthetic quality of this potential recreation site	No
8	Access to water is available at this potential recreation site for boating, canoeing, or fishing	Yes
9	The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating	No
10	Off-road public parking available at the potential recreation site	No
11	Accessibility and travel ease is present at this site	No
12	The wetland is within a short drive or safe walk from highly populated public and private areas	Yes
13	Other	
	Function Present ?	**No**

	EDUCATIONAL/SCIENTIFIC VALUE — This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research	
1	Wetland contains or is known to contain threatened, rare, or endangered species	No
2	Little or no disturbance is occurring in this wetland	No
3	Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible	No
4	Potential educational site is undisturbed and natural	No
5	Wetland is considered to be a valuable wildlife habitat	No
6	Wetland is located within a nature preserve or wildlife management area	No
7	Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc)	No
8	Off-road parking at potential educational site suitable for school bus access in or near wetland	No
9	Potential educational site is within safe walking distance or a short drive to schools	No
10	Potential educational site is within safe walking distance to other plant communities	No
11	Direct access to perennial stream at potential educational site is available	No
12	Direct access to pond or lake at potential educational site is available	No
13	No known safety hazards exist within the potential educational site	No
14	Public access to the potential educational site is controlled	No
15	Handicap accessibility is available	No
16	Site is currently used for educational or scientific purposes	No
17	Other	NA
	Function Present ?	**No**

	UNIQUENESS/HERITAGE — This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.	
1	Upland surrounding wetland is primarily urban	Yes
2	Upland surrounding wetland is developing rapidly	No
3	More than 3 acres of shallow permanent open water (less than 6 feet deep), including streams, occur in wetlands	No
4	Three or more wetland classes are present	No
5	Deep and/or shallow marsh or wooded swamp dominate	No
6	High degree of interspersion of vegetation and/or open water occur in this wetland	No
7	Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland	No
8	Potential educational site is within a short drive or a safe walk from schools	No
9	Off-road parking at potential educational site is suitable for school buses	No
10	No known safety hazards exist within this potential educational site	No
11	Direct access to perennial stream or lake exists at potential educational site	No
12	Two or more wetland classes are visible from primary viewing locations	No
13	Low-growing wetlands (marshes, scrub-shrub, bogs, open water) are visible from primary viewing locations	No
14	Half an acre of open water or 200 feet of stream is visible from the primary viewing locations	Yes
15	Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons	No

16	General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed	No	
17	Overall view of the wetland is available from the surrounding upland	Yes	
18	Quality of the water associated with the wetland is high	No	
19	Opportunities for wildlife observations are available	Yes	
20	Historical buildings are found within the wetland	No	
21	Presence of pond or pond site and remains of a dam occur within the wetland	Yes	
22	Wetland is within 50 yards of the nearest perennial watercourse	No	
23	Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland	No	
24	Wetland contains critical habitat for a state- or federally-listed threatened or endangered species	No	
25	Wetland is known to be a study site for scientific research	No	
26	Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community	No	
27	Wetland has local significance because it serves several functional values	No	
28	Wetland has local significance because it has biological, geological, or other features that are locally rare or unique	No	
29	Wetland is known to contain an important archaeological site	No	
30	Wetland is hydrologically connected to a state or federally designated scenic river	No	
31	Wetland is located in an area experiencing a high wetland loss rate	No	
32	Other	NA	
	Function Present ?		**No**
	VISUAL QUALITY/AESTHETICS — This value considers the visual and aesthetic quality or usefulness of the wetland		
1	Multiple wetland classes are visible from primary viewing locations	No	
2	Emergent marsh and/or open water are visible from primary viewing locations	Yes	
3	A diversity of vegetative species is visible from primary viewing locations	Yes	
4	Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons	No	
5	Land use surrounding the wetland is undeveloped as seen from primary viewing locations	No	
6	Visible surrounding land use form contrasts with wetland	Yes	
7	Wetland views absent of trash, debris, and signs of disturbance	No	
8	Wetland is considered to be a valuable wildlife habitat	No	
9	Wetland is easily accessed	No	
10	Low noise level at primary viewing locations	No	
11	Unpleasant odors absent at primary viewing locations	No	
12	Relatively unobstructed sight line exists through wetland	Yes	
13	Other	NA	
	Function Present ?		**No**
	ENDANGERED SPECIES HABITAT — This value considers the suitability of the wetland to support threatened or endangered species		
1	Wetland contains or is known to contain threatened or endangered species	No	
2	Wetland contains critical habitat for a state or federally listed threatened or endangered species	No	
	Function Present ?		**No**

Attachment C
Mashapaug Pond Inner Cove Sediment Remediation
Former Gorham Manufacturing Facility
Invasive Plant Species Control Plan

Remediation and subsequent restoration of Mashapaug Pond and its associated vegetated wetlands will create opportunity for noxious weeds or invasive plants (terrestrial and aquatic) to become established. In particular, disturbance caused by remediation of Mashapaug Ponds Inner Cove and its associated palustrine wetland and upland buffer may create opportunity for invasive plant species to invade and become established, and potentially out-compete desirable native plant species. This plan provides recommended methods and procedures for monitoring and removal of invasive plant species during the remediation/restoration process and throughout the monitoring phase of the project.

Introduction

The site is the Former Gorham Manufacturing Facility at 425 Adelaide Avenue, Providence RI. Mashapaug Pond Inner Cove and the adjacent palustrine wetland (and 50-foot buffer zone regulated by the State of Rhode Island) will be disturbed due to hazardous waste site remediation. Soil removal and ground disturbance will leave the remediated area highly susceptible to invasive species, which easily colonize disturbed areas due to the lack of existing vegetation and lack of natural, native control measures such as insects, diseases, or wildlife that feed on these plants.

Mashapaug Inner Cove consists of approximately 2.8 acres of open water, characterized as highly eutrophic, with a water column generally observed to be turbid with visibility to approximately one foot. The pond contains no emergent plant communities except in locations very close to shore during periods of high water when the waterline rises to encompass terrestrial shoreline plants. Mashapaug Inner Cove is bordered by a shallow footslope palustrine wetland (PFO/1B) approximately 11,075 square feet, vegetated with herbaceous plants, shrubs, and trees. The non-native plant species purple loosestrife (*Lythrum salicaria*) has been observed in the wetland. A variable thickness layer of organic-rich soil will be placed by hand over the entire palustrine wetland from the existing ground surface to a maximum thickness of up to 12 inches to serve as a protective cap. All occurrences of non-native, invasive species will be mechanically removed prior to soil placement.

The shoreline along Mashapaug Pond away from the Inner and Outer Cove is a moderate to steep slope away from the water's edge, and is characterized by a deciduous woodland community with signs of anthropogenic disturbance. West and east of the Inner Cove, and south of the palustrine wetland bordering the Inner Cove, is a vegetated upland that serves as a wetland buffer. The buffer to the wetland and cove consists of variably steep forested uplands with mature trees, a thin mixed herbaceous and woody understory, and patches of woody invasive species. Invasive species including tree-of-heaven (*Ailanthus spp.*), oriental bittersweet (*Celastrus orbiculatus*), and Japanese knotweed (*Polygonum cuspidatum*) have been observed in the upland. These species pose a serious threat due to their rapid growth rate and seed production, and may overwhelm remediated areas and exclude the growth of more desirable native species.

Monitoring

All temporarily impacted areas: Mashapaug Pond Inner Cove; the palustrine wetland; and upland buffer will be monitored twice annually for two full growing seasons for the presence of non-native invasive species. The restored wetland and the adjacent upland buffer (50 feet from water/wetland edge) will be designated a no-cut zone that will be allowed to revegetate naturally. It will not be mowed, cut, or managed in any way with the exception of invasive species management if needed.

Invasive Species Management

All equipment throughout remediation will be checked at the beginning of the day and at the end of the day for presence of invasive plant species. Once remediation is complete, establishing a thick cover of non-invasive native vegetation can help discourage establishment of non-native invasive species, as well as help stabilize remediated areas and restore the vegetated community impacted. The seed mix "New England Erosion Control/Restoration Mix for Dry Sites" or a similar approved mixt will be spread over the emplaced soil using a hydroseeding method, which includes a hydromulch with a tackifier. The seed mix selected contains native New England herbaceous species grasses to ensure that dry or recently disturbed sites will be quickly re-vegetated and the soil surface stabilized. Viable trees and woody shrubs remaining in the buffer will be amended by planting a select list of native species.

Invasive plant species most likely to pose a problem in the remediated and restored wetland areas include purple loosestrife (*Lythrum salicaria)*, and common reed *(Phragmites australis).* In the upland buffer, Japanese knotweed (*Polygonum cuspidatum)*, oriental bittersweet (*Celastrus orbiculatus)*, and Tree-of-Heaven (*Ailanthus sp.)* may colonize disturbed areas. The following measures are proposed to manage these invasive plant species.

Purple Loosestrife (*Lythrum salicaria)*

Purple loosestrife is often found in natural and man-made wetlands. This species can be effectively controlled by several methods. Typical control measures include hand pulling, herbicide treatment or biological control (*Galerucella* spp. beetles). Purple loosestrife is shade-intolerant and once the planted shrub and forested species provide a canopy that shades the restoration areas, purple loosestrife should not be a concern.

If purple loosestrife is encountered during or after remedial activities and restoration, it will be pulled by hand or dug up if the plant is not too big and the infestation is not too widespread. However, digging or hand pulling of larger plants (greater than 18 inches tall) becomes ineffective since the large fibrous root system makes it unlikely the plant can be pulled up or that all of the plant will be removed. An alternative approach may be needed, such as an herbicide treatment. Vegetation that is pulled up by hand must be managed properly. Allowing the plant material to dry out and die before disposal is required to ensure the removed plants are unable to re-root elsewhere. Placing the removed plants in sealed black plastic bags and left in the sun for several weeks should ensure the plants are killed before disposal.

Common Reed (*Phragmites australis*)

Common reed is a very aggressive grass species with an extensive rhizomatous root system that, once established, can be extremely difficult to eradicate. It is a common invasive grass species

typical to wetland areas. The most effective control method is the application of glyphosate herbicide. Because these species reproduce vegetatively, some cultural control methods such as mowing, disking or cutting can actually increase its spread.

If common reed is encountered after remedial activities and during restoration monitoring, glyphosate will be applied to the foliage in late August to October, prior to the first frost. Herbicide application must be conducted by a registered herbicide applicator and be in accordance with the Rhode Island General Laws for Pesticide Control.

Japanese Knotweed *(Polygonum cuspidatum)*

Japanese knotweed is an aggressive perennial plant that sprouts from an extensive root and rhizome system. Roots can extend 20 feet from the plant and down 7 feet into the soil. Mechanical control means may be used, but any roots left in the soil will re-sprout. Herbicide applications will likely be required to control this species if it becomes established.

If Japanese knotweed is discovered in the remediation and restoration areas, hand pulling will be used initially on individual plants, and is the recommended method for this project because early and regular site monitoring is expected to provide opportunity for early control. Hand-pulling can be done when individual plants are small, and must be repeated every few weeks to a month during the growing season. When observed, plants should be pulled and bagged for disposal in a land fill. Do not leave on the ground as stems and stem fragments can root. Cutting or mowing is not recommended as this will stimulate growth and tends to produce numerous small shoots. If an extensive infestation of Japanese knotweed is found during monitoring stages, herbicides can be used as a foliar application or injected into the plant stems. Foliar applications should be conducted in July to September, from flower bud to seeding stage. Foliar applications include risk of drift of herbicide to non-target species. Herbicides suitable for knotweed include glyphosate, imazapyr, and triclopyr. Stem injection of concentrated herbicide has proven highly effective, and this method reduces the potential for drift and impacts to non-target species. Up to 95 percent or more of the plants can be controlled in the first year, but this method is time- and labor-intensive for large stands. Every plant stem (cane) must be injected. Only stems over ½ inch can be effectively injected, so some smaller canes may not be treated. Multiple years of treatment will likely be needed to fully eradicate the stand. Herbicide application can be used in connection with mechanical methods (cutting and pulling) to reduce the amount of herbicide required. Any herbicide application must be conducted in accordance with the Rhode Island General Laws for Pesticide Control and applied by a certified applicator.

Oriental Bittersweet (*Celastrus orbiculatus)*

Oriental bittersweet is a spreading deciduous vine that climbs trees and shrubs and can shade out native vegetation. Tree canopies weighed down with the vine become more susceptible to wind, snow, and ice damage. The Project and restoration area are highly susceptible to oriental bittersweet invasion due to the already established colony nearby. Oriental bittersweet is not typically found in wetlands, but will often colonize within close proximity where soil disturbance has occurred.

If bittersweet is found within the restoration area it will be pulled by hand or dug up if the plant is not too big and the infestation is not too widespread. This is the best control method to prevent establishment by continually monitoring throughout the remediation and restoration project and pulling small plants immediately. Small plants will be easily pulled. Larger plants can be controlled

by cutting the vines and immediately treating the stump with herbicide such as glyphosate or triclopyr. Cutting without herbicide treatment will stimulate re-growth and should not be done. Large patches of bittersweet can be treated with a foliar application of herbicide, however, this will also damage or kill any shrubs or trees on which the bittersweet vines are growing. Any herbicide application must be conducted in accordance with the Rhode Island General Laws for Pesticide Control and applied by a certified applicator.

Tree-of-Heaven (*Ailanthus sp*.)

Tree of Heaven is an exotic, rapidly growing, deciduous tree. Elimination of Ailanthus requires diligence; its seed production, germination rate, and sprouting potential make repeated follow-up monitoring essential. New sprouts or seedlings should be treated as soon as possible after detection so they will not rebuild root and seed reserves. Establishing a thick cover of non-invasive native vegetation can help discourage re-establishment but will not prevent it.

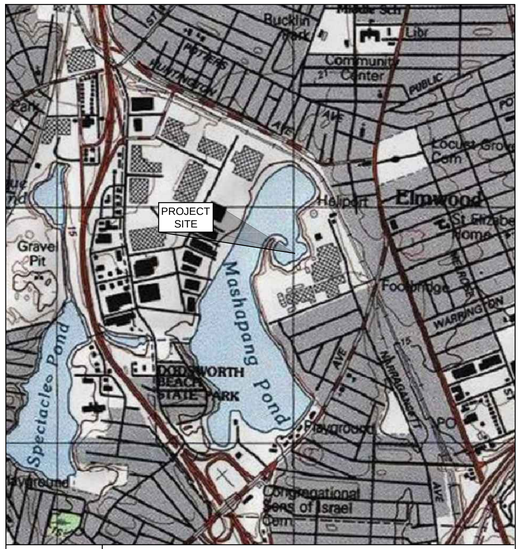
If Ailanthus is discovered during or after remediation and restoration activities, it will be removed by hand pulling or digging up young seedlings as soon as they are large enough. This must be done before the plants start to produce seeds or develop a tap root. Cutting can also be used for removal of Ailanthus. Manually operated tools, like brush cutters, saws, axes, machetes, or clippers can be used to cut Ailanthus. This is an initial control practice, and long-term success will likely require either an herbicidal control or repeated cutting of re-sprouts.

Aquatic Invasive Species

In addition to terrestrial invasive species, rooted or floating aquatic invasive macrophytes also pose a serious threat to impacting Mashapaug Pond Inner Cove remediation area, and a significant threat to the ecological integrity of the freshwater ecosystem. Aquatic invasive species threaten the ecological stability and have traits that allow them to quickly outgrow and crowd out native species. Once dominant, aquatic invasive species disrupt native habitat and threaten the natural diversity and abundance of desirable native species. There are currently no documented aquatic invasive species in Mashapaug Pond. All equipment will be monitored during and after remediation for the presence of invasive aquatic species. If any aquatic invasive species are identified during the monitoring program they will be removed immediately.

Other invasive plant species not discussed here may become established in the wetland restoration areas (terrestrial or aquatic). If any invasive species are observed during any part of the monitoring program, they will be addressed as appropriate.

TEXTRON, INC.
REMEDIAL ACTION WORK PLAN
FORMER GORHAM MANUFACTURING SITE
PROVIDENCE, RHODE ISLAND
MARCH, 2015



LOCUS MAP

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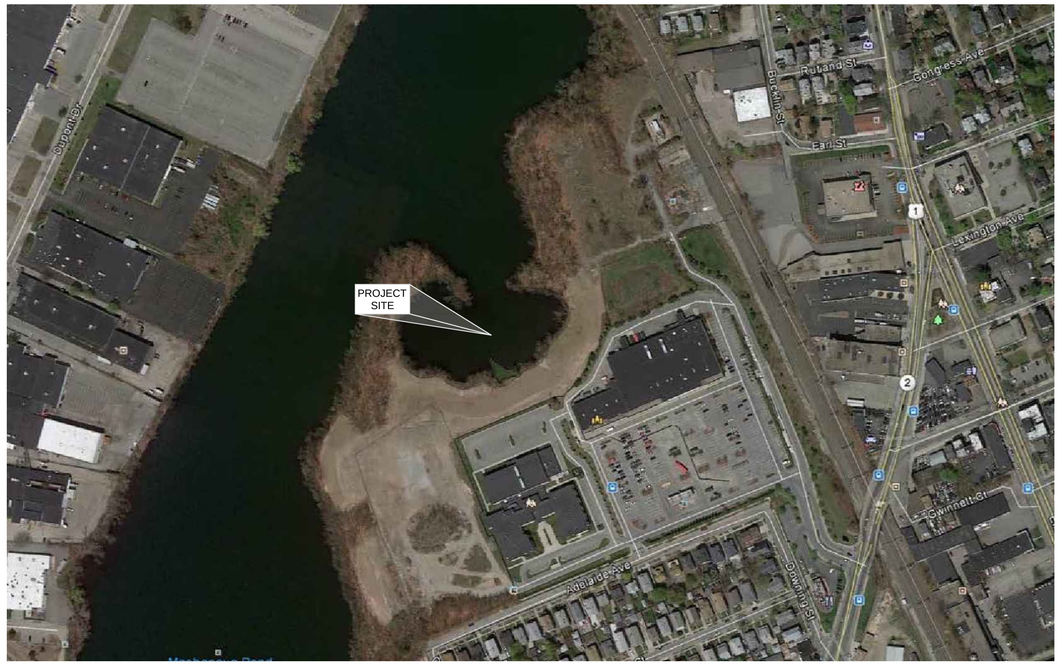
SCALE IN FEET



MAP SOURCE: GOOGLE EARTH PRO

KEY

0 100 200 400

SCALE IN FEET

DRAWING INDEX

SHEET NUMBER	DRAWING TITLE	DISCIPLINE NUMBER
	COVER SHEET	G-001
1	GENERAL NOTES, ABBREVIATIONS, AND LEGEND	G-002
2	OVERALL SITE PLAN	V-101
3	DEMOLITION AND EROSION AND CONTROL PLAN, SHEET 1 OF 3	V-102
4	DEMOLITION AND EROSION AND CONTROL PLAN, SHEET 2 OF 3	V-103
5	DEMOLITION AND EROSION AND CONTROL PLAN, SHEET 3 OF 3	V-104
6	PROPOSED SITE PLAN, SHEET 1 OF 3	C-101
7	PROPOSED SITE PLAN, SHEET 2 OF 3	C-102
8	PROPOSED SITE PLAN, SHEET 3 OF 3	C-103
9	DETAILS, SHEET 1 OF 2	C-501
10	DETAILS, SHEET 2 OF 2	C-502

PREPARED FOR:

TEXTRON

PREPARED BY:

amec foster wheeler

ISSUED FOR PERMITTING

GENERAL NOTES:

1. PLANS HAVE BEEN COMPILED FROM ON-SITE INVESTIGATIONS, GIS, LiDAR AND SURVEY. SEE PLAN REFERENCES FOR FURTHER INFORMATION.
2. VERTICAL LAYOUT BASED UPON THE CONTROL DATUM SHOWN ON V-101.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW OF ALL DRAWINGS PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER, INCLUDING DISCREPANCIES TO ANY CODE/REGULATORY REQUIREMENT, PRIOR TO START OF CONSTRUCTION. IF ANY DISCREPANCIES OR PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
4. ALL ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL, STATE, AND FEDERAL JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE WORK SHALL ALSO CONFORM TO ALL APPLICABLE TEXTRON REQUIREMENTS.
5. CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE THE WORK.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE OWNER, ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
9. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH, AND EQUIPMENT AS SPECIFIED, CONTRACTOR SHALL CLEAN AND SUPPLY A ROLL-OFF CONTAINER OR DUMPSTER TO BE EMPTIED AS NEEDED. CLEANING SHALL BE IN COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS. AT PROJECT COMPLETION, PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM TRASH, DEBRIS, DUST, OR OTHER HAZARDS OF ANY NATURE.
10. DISPOSAL OF ALL MATERIALS SHALL BE COMPLETED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
11. THE CONTRACTOR SHALL COMPLY WITH ALL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS AS THEY APPLY TO THIS PROJECT. ANY PERSONNEL THAT HAVE THE POTENTIAL TO BE EXPOSED TO HAZARDOUS OR POTENTIALLY HAZARDOUS MATERIALS, SHALL BE TRAINED AND PERFORM ALL WORK IN COMPLIANCE WITH 29 CFR 1910.120, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (HAZWOPER).
12. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, AND EXISTING FEATURES. PRIOR TO THE START OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER. CONTRACTOR SHALL VERIFY ACTUAL FIELD CONDITIONS PRIOR TO CONSTRUCTION.
13. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL UTILITIES AND SERVICES THROUGHOUT THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL PROTECT ALL UTILITY LINES THROUGHOUT ALL PHASES OF WORK.
14. UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND MAY NOT INCLUDE ALL UTILITIES WITHIN THE PROJECT SITE.
15. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UNDERGROUND PIPING AND STRUCTURES PRIOR TO ANY EXCAVATION ACTIVITIES BY CONTACTING THE CITY OF PROVIDENCE FOR WATER LOCATION AND RHODE ISLAND DIG-SAFE (1-800-DIG-SAFE) (72) HOURS BEFORE STARTING CONSTRUCTION ACTIVITIES FOR FIELD MARKING UNDERGROUND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING UNDERGROUND UTILITIES THAT MAY NOT BE MARKED BY THE UTILITY COMPANIES. SUBSURFACE CONDITIONS ARE NOT GUARANTEED. THE CONTRACTOR SHALL REPAIR CONTRACTOR-CAUSED DAMAGE ACCORDING TO LOCAL STANDARDS AT CONTRACTOR'S EXPENSE.
16. UNLESS OTHERWISE NOTED, ALL EXISTING FEATURES DESIGNATED ON THE PLANS ARE TO REMAIN. INCLUDING, BUT NOT LIMITED TO, TREES, SIGNS, FENCING/GATES, AND SIGN POSTS. FEATURES SHALL BE VERIFIED, LOCATED AND PROTECTED DURING ALL PHASES OF CONSTRUCTION.
17. THE SITE IS ADJACENT TO AN ACTIVE NEIGHBORHOOD, HIGH SCHOOL, AND RETAIL CENTER WHICH WILL BE OPERATIONAL DURING CONSTRUCTION. ALL CONSTRUCTION ACTIVITIES MUST BE COMPLETED WITH RESPECT TO THE ONGOING ACTIVITIES OF THE SURROUNDING AREAS. ACCESS ROADWAYS SHALL REMAIN OPEN AND FREE OF DEBRIS AT ALL TIMES.
18. ALL ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT SOIL EROSION AND SEDIMENT CONTROL PLAN, RHODE ISLAND STORMWATER DESIGN AND INSTALLATION STANDARDS MANUAL, THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP), AND THE RHODE ISLAND POLLUTION DISCHARGE ELIMINATION SYSTEM (RIPDES), CONSTRUCTION GENERAL PERMIT.
19. CONTRACTOR SHALL LIMIT ALL CONSTRUCTION ACTIVITIES TO LIMITS OF DISTURBANCE. AS SHOWN AND REQUIRED TO REACH ALL SOIL REMOVAL AREAS SHOWN ON SHEET V-101.
20. PLACING OF TOPSOIL AND HYDROSEEDING SHALL NOT OCCUR UNTIL AUTHORIZED BY THE ENGINEER.
21. BACKFILL MATERIALS AND COMPACTION REQUIREMENTS SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
22. ALL ROADWAYS AND BUILDINGS SHALL BE MAINTAINED AND PROTECTED AS DESCRIBED IN THE SPECIFICATIONS. DAMAGED AND REMOVED SECTIONS OF ROADWAY SHALL BE REPLACED IN KIND, AND AT CONTRACTOR'S EXPENSE IF NOT PART OF THE WORK.
23. DISTURBED AREAS SHALL BE PLANTED AND SEEDED AS SPECIFIED IN THE CONTRACT DOCUMENTS.
24. THE CONTRACTOR SHALL REPORT TO THE CLIENT OR THE ENGINEER ALL SPILLS AND LEAKS OF OIL OR OTHER HAZARDOUS SUBSTANCES (E.G., OIL, ANTIFREEZE, CHEMICALS, ETC.) OCCURRING DURING THE PERFORMANCE OF THIS CONTRACT IMMEDIATELY UPON DISCOVERY, REGARDLESS OF THE QUANTITY.
25. THE CONTRACTOR SHALL PREVENT DEBRIS FROM ENTERING ALL SWALES, INLETS, AND BASINS. PROVIDE AND MAINTAIN INLET PROTECTION FOR THE DURATION OF THE WORK. CLEAN ALL STRUCTURES AT THE COMPLETION OF THE WORK.
26. CONTRACTOR SHALL PROVIDE A FULL SET OF AS-BUILT DRAWINGS TO THE OWNER AT THE COMPLETION OF THE PROJECT IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.
27. ELEVATED CONCENTRATIONS OF PAHs, METALS AND DIOXINS EXIST IN SURFACE SOILS WITHIN THE PROPOSED CONSTRUCTION LAYDOWN/STAGING/DECONTAMINATION AREAS. CONTRACTOR SHALL PERFORM DECONTAMINATION ACTIVITIES IN ACCORDANCE WITH THE SPECIFICATIONS. ALL MATERIAL STAGED WITHIN THESE AREAS MUST BE SEGREGATED SUCH THAT THERE IS NO CROSS CONTAMINATION.
28. CONTRACTOR TO PROVIDE DEWATERING AND SHORING DESIGN TO THE ENGINEER FOR APPROVAL FOR THE REMEDIATION ON THE INNER COVE.
29. CONTRACTOR SHALL REMOVE ORGANIC SEDIMENT FROM THE INNER COVE DOWN TO THE SANDY/GRAVEL MATERIAL TO A MAXIMUM DEPTH OF 2 FEET.

GRADING, DRAINAGE, AND EROSION CONTROL NOTES:

1. NO VEGETATION SHALL BE DISTURBED EXCEPT AS NOTED HEREON OR AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY THE ENGINEER. NO HEAVY EQUIPMENT SHALL BE OPERATED OR STORED AND NO MATERIALS SHALL BE HANDLED OR STORED WITHIN THE DRIP LINES OF UNDISTURBED TREES OR WITHIN 50 FEET FROM THE LIMIT OF WETLANDS AND/OR MASHAPAUG POND.
2. ALL DISTURBED AREAS WHICH ARE FINISH GRADED WITH NO FURTHER CONSTRUCTION TO TAKE PLACE SHALL BE STABILIZED WITH SEED AND MULCH WITHIN 7 CALENDAR DAYS AFTER GRADING IS COMPLETE. AREAS WHICH ARE NOT TO FINAL GRADE BUT WILL NOT BE REWORKED FOR 21 DAYS MUST BE TEMPORARILY SEEDED AND MULCHED WITHIN 14 CALENDAR DAYS.
3. CONSTRUCT TEMPORARY EROSION CONTROL AS SHOWN ON THE DRAWINGS PRIOR TO STARTING WORK. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING CONSTRUCTION. WHEN LAND IS EXPOSED DURING CONSTRUCTION, THE EXPOSURE SHOULD BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME. LAND SHOULD NOT BE LEFT EXPOSED DURING THE WINTER MONTHS.
4. ALL DRAINAGE STRUCTURES (INCLUDING SWALES) IMPACTED BY THE CONTRACTOR'S ACTIVITIES SHALL BE INSPECTED WEEKLY AND DAILY DURING STORM EVENTS. INLET PROTECTION DEVICES SHOULD BE CLEANED OR REMOVED AND REPLACED BEFORE SIX INCHES OF SEDIMENT CAN ACCUMULATE.
5. SILT FENCE AND AUGMENTED SILT FENCE SHALL BE INSTALLED AND MAINTAINED WHERE SHOWN. ADDITIONAL PERIMETER CONTROLS SHALL BE ADDED AS REQUIRED BY THE ENGINEER PRIOR TO ANY ON SITE DISTURBANCE OF EXISTING SURFACE MATERIAL. SILT FENCE SHALL BE MAINTAINED DURING AND AFTER CONSTRUCTION TO REMOVE SEDIMENT FROM RUNOFF WATER AND FROM LAND UNDERGOING CONSTRUCTION. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN ITS DEPTH REACHES 50% OF THE HEIGHT OF THE FENCE. WHERE POSSIBLE, NATURAL DRAINAGE WAYS SHOULD BE UTILIZED AND LEFT OPEN TO REMOVE CLEAN EXCESS SURFACE WATER.
6. ALL LOCATIONS OF TEMPORARY EROSION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS REQUIRED BY THE ENGINEER, AND SHALL BE REPLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
7. TEMPORARY EROSION AND SEDIMENT CONTROL BMPS (INCLUDING ALL CONSTRUCTION ENTRANCES) SHALL BE REMOVED WITHIN 30 CALENDAR DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED AS DETERMINED BY THE ENGINEER. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE PERMANENTLY STABILIZED (80% VEGETATION DENSITY).
8. REPLACE DAMAGED SILT BARRIERS AS REQUIRED BY THE ENGINEER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS
9. CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS AND INVERTS PRIOR TO BEGINNING WORK.
10. EXISTING CONTOUR LINES AND SPOT ELEVATIONS ARE THE RESULT OF FIELD SURVEY, GIS AND LiDAR DATA. SHOULD THE CONTRACTOR HAVE ANY QUESTIONS OF THEIR INTENT OR ANY PROBLEMS WITH CONTINUITY OF GRADES, THE ENGINEER SHALL BE CONTACTED PRIOR TO BEGINNING WORK.
11. STABILIZE ALL STOCKPILES AND ALL OTHER AREAS OF THE SITE THAT SHALL REMAIN UNDISTURBED FOR 14 CALENDAR DAYS OR MORE.
12. CONTRACTOR SHALL NOT LEAVE ANY OPEN HOLES WITH A DROP GREATER THAN 12" OVERNIGHT.
13. STORMWATER DRAINAGE SHALL BE CONTROLLED ONSITE, SUCH THAT THERE IS NO CHANNELIZED FLOW OF RUNOFF TOWARDS THE POND.
14. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS AND WHEREVER CONSTRUCTION TRAFFIC ENTERS AND LEAVES THE SITE. EXISTING CONSTRUCTION EXITS SHALL BE INSPECTED AND MAINTAINED TO REFLECT REQUIREMENTS AS STATED IN THE CONTRACT DOCUMENTS.
15. THE EROSION CONTROL DEVICES SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THE CONTRACT DOCUMENTS REPRESENT THE MINIMUM REQUIRED FOR EROSION CONTROL. THE CONTRACTOR SHALL ADD TO THESE DEVICES ANY AND ALL MEASURES AS REQUIRED BY THE ENGINEER TO EFFECTIVELY PREVENT EROSION AND MIGRATION OF SEDIMENT FROM THE WORK AREA.
16. ALL SURFICIAL FILL MATERIALS TO BE CONSOLIDATED SHALL ONLY BE STOCKPILED WITHIN THE PROPOSED LIMITS OF CAPPING. NO IMPACTED MATERIALS SHALL BE STOCKPILED OUTSIDE THE PROPOSED LIMITS OF CAP.
17. ALL INTERNAL HAUL TRUCKS CONSOLIDATING IMPACTED MATERIAL SHALL BE DECONTAMINATED PRIOR TO ACCESSING CLEAN AREAS WITHIN THE SITE.
18. PRIVACY PANELS SHALL BE INSTALLED AND MAINTAINED ALONG THE PERIMETER CHAIN LINK FENCE AS SHOWN IN THE CONTRACT DOCUMENTS TO MINIMIZE DUST DISTURBANCE TO THE SURROUNDING COMMUNITY.
19. EROSION CONTROL MATTING SHALL BE INSTALLED ON ALL SLOPES 3:1 OR GREATER AND BELOW ALL PROPOSED STORMWATER MANAGEMENT DISCHARGES.

PLAN REFERENCES:

1. PLAN PREPARED BY THE U.S. ARMY CORPS OF ENGINEERS, ENTITLED 'SEWER SYSTEM' DATED SEPTEMBER 1943 AND REVISED OCTOBER 1943 (AS-BUILT) ORIGINAL SCALE: 1" = 100'
2. SELECTED SITE FEATURES DIGITIZED FROM DIVERSIFIED TECHNOLOGY CONSULTANTS' FIGURE 7 TITLED 'BATTERY HAMILTON AND BORING/SAMPLING LOCATIONS' DATED AUGUST 8, 1999 FROM THE 'RESEARCH AND ASSESSMENT STUDY' DATED OCTOBER 2000.
3. WETLAND DELINEATION COMPLETED BY VANASSE HANGEN BRUSTLIN, INC. (VHB) ON MAY 2004.
4. WETLAND DELINEATION REVIEWED IN THE FIELD BY RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, AUGUST 2011.
5. TOPOGRAPHIC (1-FOOT CONTOURS) AND LOCATION SURVEY COMPLETED BY CABCO CONSULT, INC. TITLED 'TOPOGRAPHIC PLAN OF LAND' DATED MAY 24, 2007.
6. PARCEL B TOPOGRAPHY AND FIELD SURVEY COMPLETED BY EDWARD ROWSE ARCHITECTS TITLED 'PROVIDENCE HIGH SCHOOL, GORHAM MILLS, PROVIDENCE RHODE ISLAND, SITE PLAN DATED 2007.
7. PARCEL A TOPOGRAPHY AND FIELD SURVEY COMPLETED BY VANASSE HANGEN BRUSTLIN, INC. (VHB) TITLED 'RETAIL DEVELOPMENT SITE PLAN' DATED 2001.
8. BATHYMETRIC CONTOURS OF MASHAPAUG COVE AND MASHAPAUG POND COMPLETED BY TG&B MARINE ON DECEMBER, 2011.

SUGGESTED CONSTRUCTION SEQUENCE:

1. ESTABLISH VERTICAL AND HORIZONTAL CONTROL.
2. INSTALL EROSION AND SEDIMENTATION CONTROL DEVISES AS SHOWN AND AS REQUIRED PRIOR TO SITE DISTURBANCE.
3. CLEAR AND GRUB TO THE LIMITS SHOWN ON THE PLANS AS DEPICTED BY THE 'LIMIT OF DISTURBANCE' LINE.

PARCEL C

1. REGRADE EXISTING SOILS TO PREPARE THE SUBGRADE ELEVATIONS AS SHOWN.
2. INSTALL CAPPING MATERIALS FOR COMPLETION OF THE PARCEL C-1 UPLAND SOIL CAP.
3. SEED AND STABILIZE THE PARCEL C CAP.

INNER COVE

1. PREPARE PARCEL C-1 UPLAND AREA FOR SEDIMENT PROCESSING.
2. INSTALL DEWATERING SYSTEM (PER CONTRACTOR APPROVED DEWATERING METHOD).
3. INSTALL GRAVEL ACCESS ROAD TO INNER COVE.
4. COMPLETE INNER COVE REMOVAL OF IMPACTED SEDIMENTS.
5. COMPLETE PROCESSING/DEWATERING/STABILIZATION OF DREDGED SEDIMENT.
6. CONSOLIDATE PROCESSED SEDIMENT WITHIN PROPOSED LIMITS AS SHOWN.
7. INSTALL CAPPING MATERIALS FOR COMPLETION OF THE INNER COVE SEDIMENT SOIL CAP.
8. INSTALL CAPPING MATERIALS FOR COMPLETION OF THE CONSOLIDATED SEDIMENT SOIL CAP.
9. SEED AND STABILIZE THE CONSOLIDATED SEDIMENT CAP.

PARCEL C-1

1. REMOVE ALL INNER COVE SEDIMENT DEWATERING AND PROCESSING MATERIALS.
2. REGRADE EXISTING SOILS TO PREPARE THE SUBGRADE ELEVATIONS AS SHOWN.
3. INSTALL CAPPING MATERIALS FOR COMPLETION OF THE PARCEL C-1 SOIL CAP.
4. SEED AND STABILIZE THE PARCEL C-1 CAP.
5. SITE RESTORATION AND CLEAN-UP.

ABBREVIATIONS:

APPROX	APPROXIMATELY
BLDG	BUILDING
BMPs	BEST MANAGEMENT PRACTICES
CB	CATCH BASIN
CI	CAST IRON
℄	CENTER LINE
CONC	CONCRETE
DIA	DIAMETER
Ø	DIAMETER
E	EASTING, EAST
ELEV	ELEVATION
'	FEET
GPM	GALLONS PER MINUTE
HDPE	HIGH DENSITY POLYETHYLENE
ID	IDENTIFICATION, INSIDE DIAMETER
"	INCHES
LF	LINEAR FEET
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MW	MONITORING WELL
N	NORTHING, NORTH
NE	NORTHEAST
NTS	NOT TO SCALE
NW	NORTHWEST
OD	OUTSIDE DIAMETER
OZ	OUNCE
PPM	PARTS PER MILLION
PVC	POLYVINYL CHLORIDE
RC	REINFORCED CONCRETE
S	SOUTH, SLOPE
SB	SOIL BORING
SE	SOUTHEAST
SF	SQUARE FEET
SW	SOUTHWEST
TYP	TYPICAL

GENERAL LEGEND:

- 55 — 1FT EXISTING CONTOUR
- EXISTING LIMIT OF TREE
- LARGE DIAMETER TREE WITH NUMERICAL DESIGNATION
- LIMIT OF WETLAND
- EDGE OF WATER
- 50' PERIMETER WETLAND LINE
- PROPERTY LINE
- EXISTING PAVEMENT
- EXISTING LIMIT OF SURFICIAL FILL
- TC — EXISTING TURBIDITY CURTAIN
- D — EXISTING DRAIN LINE
- EXISTING STRUCTURE
- EXISTING MONITORING WELL
- EXISTING SURFACE WATER AND SEDIMENT SAMPLE LOCATION
- EXISTING WELLS TO BE SAMPLED
- EXISTING WELL TO BE ABANDONED
- X X X — EXISTING FENCE TO BE REMOVED
- X X X — EXISTING FENCE
- WF-199 — WETLAND FLAG
- EXISTING SOIL CAP
- EXISTING GEOMEMBRANE CAP
- PROPOSED 1FT CONTOUR
- PROPOSED 5FT CONTOUR
- TC — PROPOSED TURBIDITY CURTAIN
- LOD — PROPOSED LIMIT OF DISTURBANCE
- SF SF SF SF — PROPOSED SILT FENCE
- ASF — PROPOSED AUGMENTED SILT FENCE
- PROPOSED GRAVEL ACCESS
- PROPOSED EDGE OF GRAVEL
- PROPOSED LIMIT OF CAPPING SYSTEM
- PROPOSED MONITORING WELL
- PROPOSED TREE LINE
- PROPOSED FRINGE WETLAND TOE CAP
- PROPOSED PERIMETER WETLAND CAP
- PROPOSED UPLAND CAP
- PROPOSED EROSION CONTROL MATTING

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REVISION	DATE	DESCRIPTION	ISSUED BY	APPROVED
2	03/11/2015	ISSUED FOR PERMITTING	DAA	RJB
1	02/13/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB
0	01/12/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB

PROJECT: TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE: GENERAL NOTES, ABBREVIATIONS, AND LEGEND

CLIENT: TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: NONE
PROJECT NUMBER: 3652140032	
DRAWING NUMBER: G-002	
SHEET NUMBER: 1 OF 10	

X:\Textron\Sheets\1 - 3652140032.01 - G-002.dwg - 3652140032.01 - G-002 - Mar 11, 2015 8:12am - william.whitten

NOTES:
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2. SEE SHEET 1 FOR LEGEND AND NOTES.

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0	01/12/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB

PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
OVERALL SITE PLAN

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN

PROJECT NUMBER: 3652140032

DRAWING NUMBER: V-101

SHEET NUMBER: 2 OF 10

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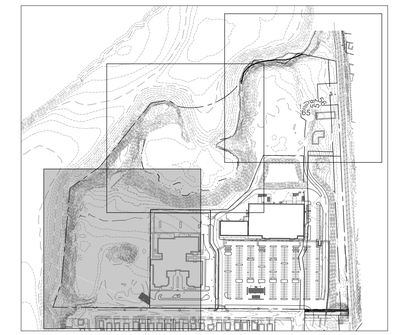

KEY
NOT TO SCALE

NOTES:
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2. SEE SHEET 1 FOR LEGEND AND NOTES.

0' 20' 40' 60'
1" = 40'

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PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
DEMOLITION AND EROSION AND CONTROL PLAN
SHEET 1 OF 3

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN
PROJECT NUMBER: 3652140032	
DRAWING NUMBER: V-102	
SHEET NUMBER: 3 OF 10	

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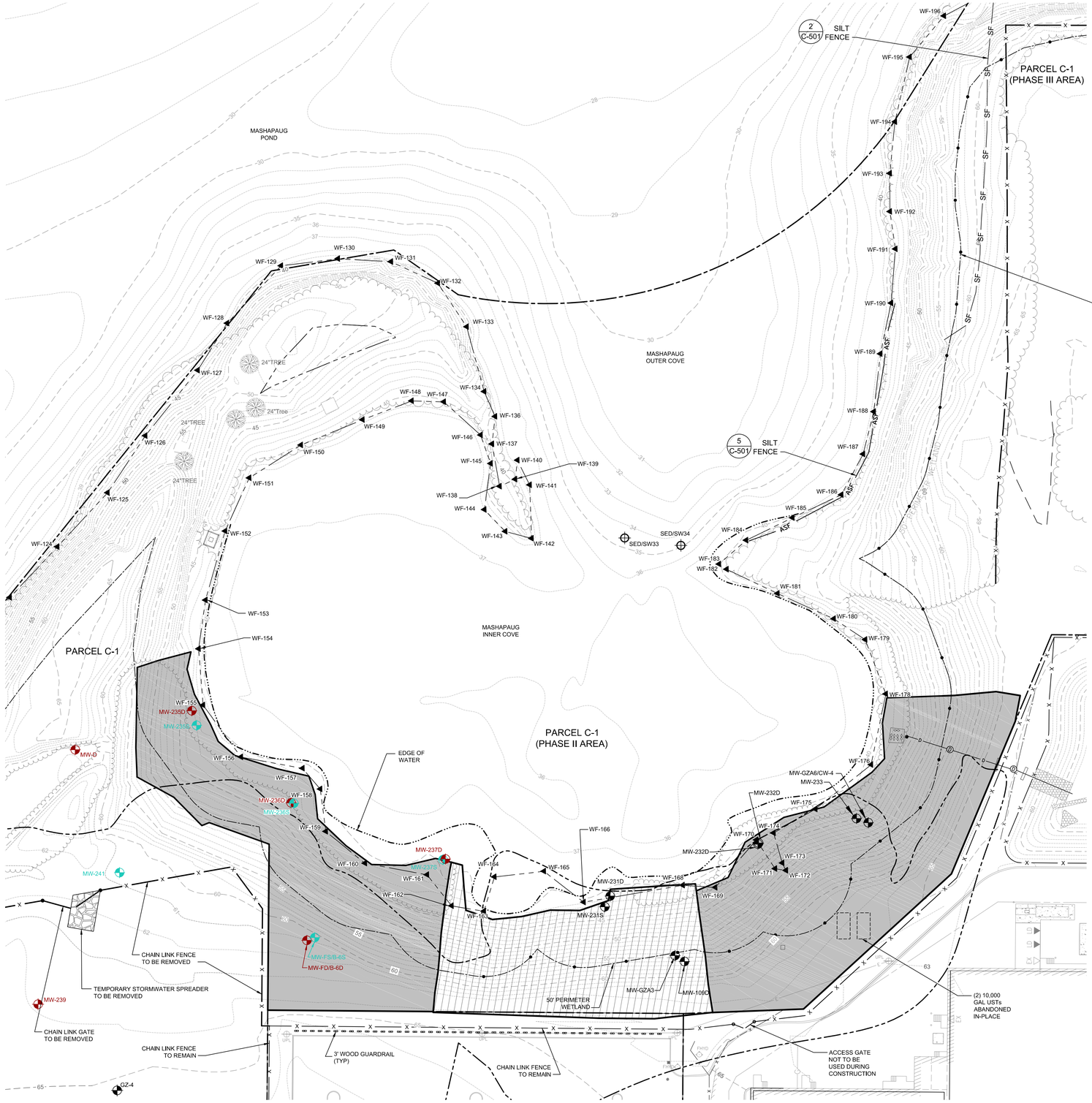

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PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
DEMOLITION AND EROSION AND CONTROL PLAN
SHEET 2 OF 3

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN
PROJECT NUMBER: 3652140032	
DRAWING NUMBER: V-103	
SHEET NUMBER: 4 OF 10	

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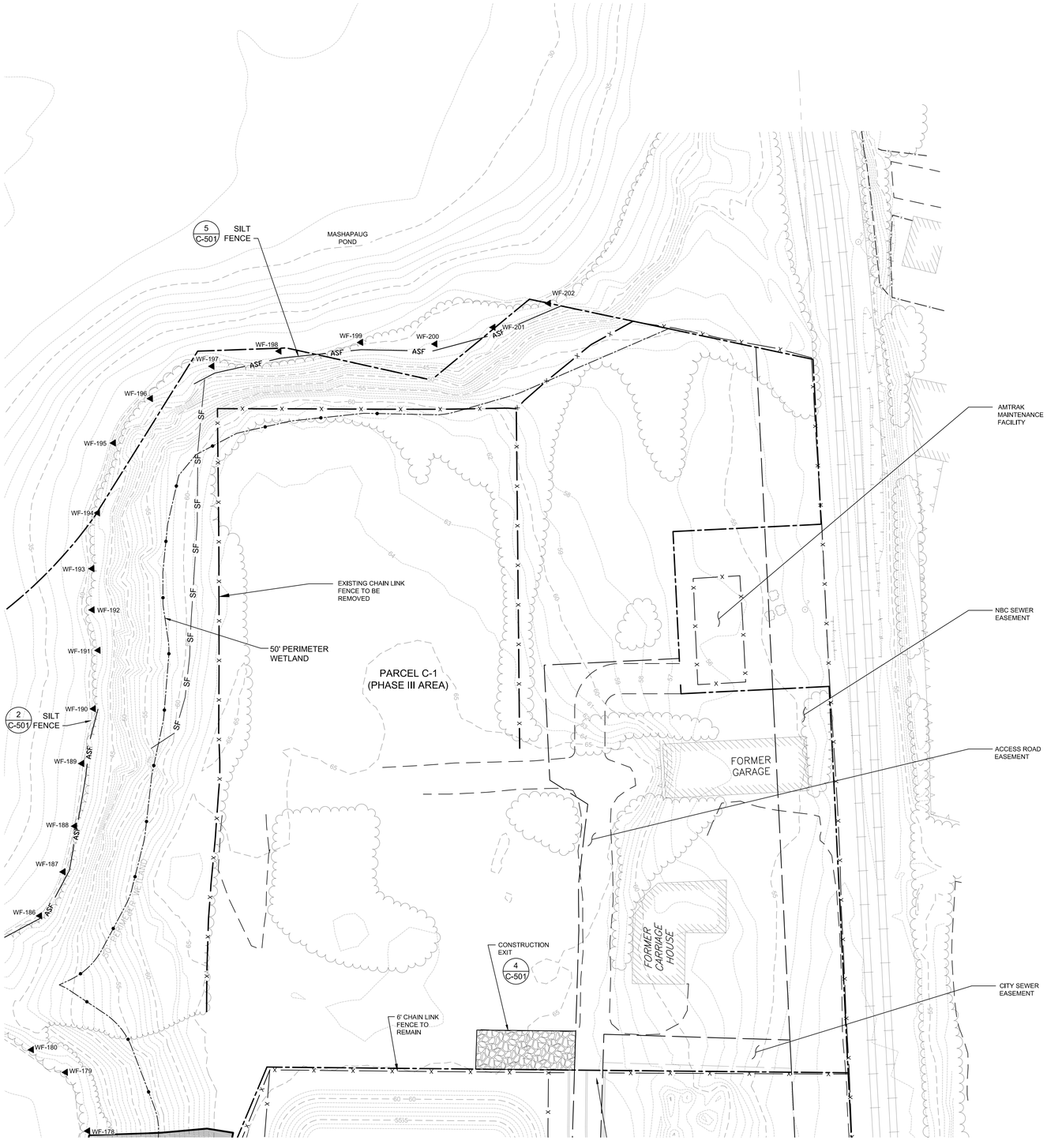

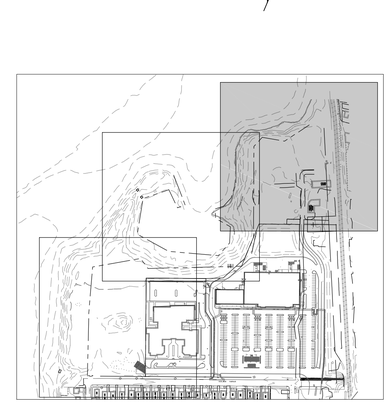

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0	01/12/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB

PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
DEMOLITION AND EROSION
AND CONTROL PLAN
SHEET 3 OF 3

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN

PROJECT NUMBER: 3652140032

DRAWING NUMBER: V-104

SHEET NUMBER: 5 OF 10

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NOTES:
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0	01/12/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB

PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
PROPOSED SITE PLAN
SHEET 1 OF 3

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN
PROJECT NUMBER: 3652140032	
DRAWING NUMBER: C-101	
SHEET NUMBER: 6 OF 10	

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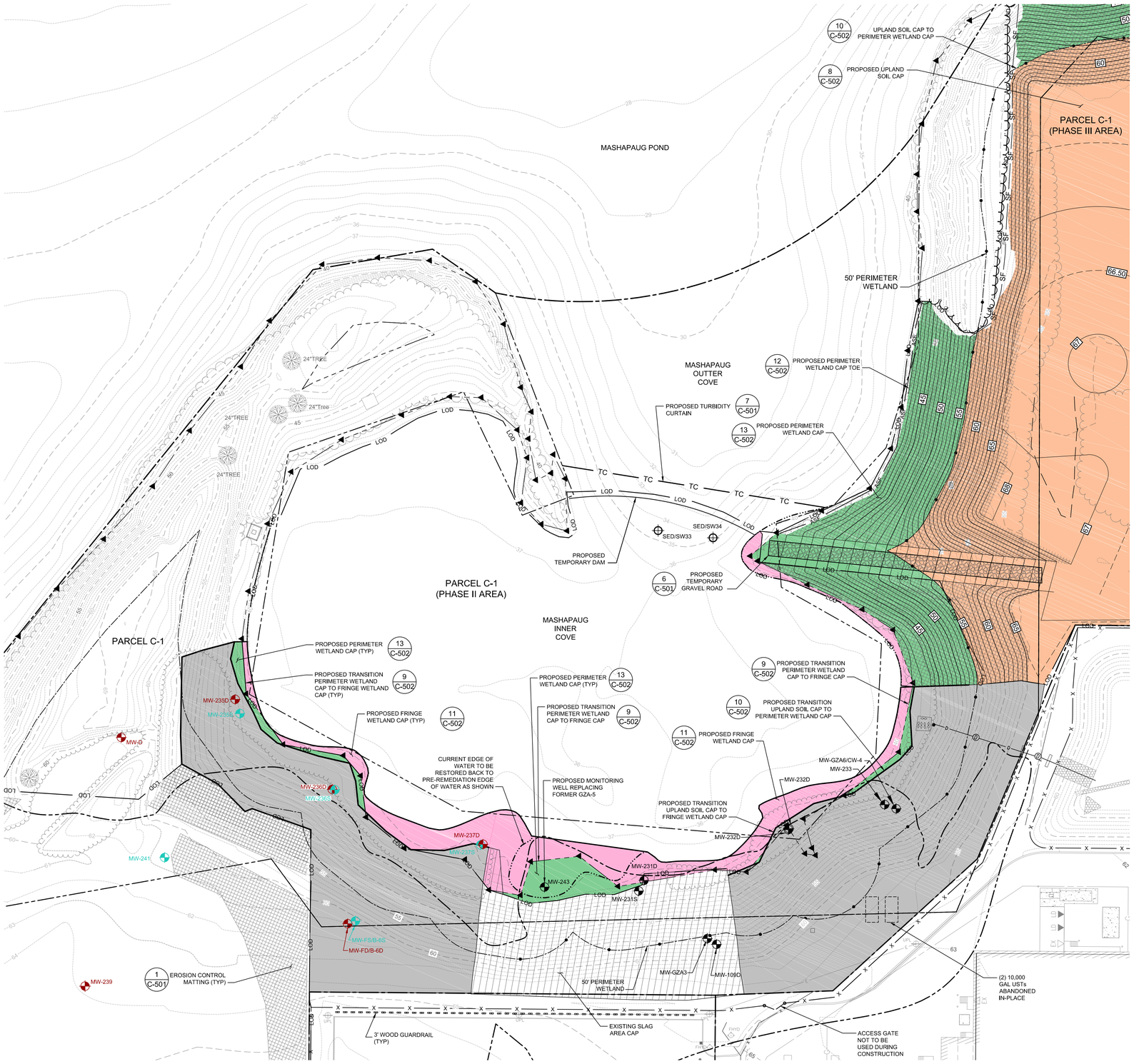

NOTES:
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PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
PROPOSED SITE PLAN
SHEET 2 OF 3

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN

PROJECT NUMBER: 3652140032

DRAWING NUMBER: **C-102**

SHEET NUMBER: **7 OF 10**

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MASHAPAUG POND

MASHAPAUG OUTER COVE

MASHAPAUG INNER COVE

PARCEL C-1 (PHASE III AREA)

PARCEL C-1 (PHASE III AREA)

8 C-502 PROPOSED UPLAND CAP

13 C-502 PROPOSED PERIMETER WETLAND CAP

12 C-502 PROPOSED PERIMETER WETLAND CAP TOE

10 C-502 UPLAND SOIL CAP TO PERIMETER WETLAND CAP

PROPOSED PERIMETER WETLAND CAP TOE

7 C-501 PROPOSED TURBIDITY CURTAIN

13 C-502 PROPOSED PERIMETER WETLAND CAP

PROPOSED TEMPORARY DAM

6 C-501 PROPOSED TEMPORARY GRAVEL ROAD

13 C-502 PROPOSED PERIMETER WETLAND CAP (TYP.)

9 C-502 PROPOSED TRANSITION PERIMETER WETLAND CAP TO FRINGE CAP

9 C-502 PROPOSED TRANSITION PERIMETER WETLAND CAP TO FRINGE CAP

PROPOSED TRANSITION UPLAND SOIL CAP TO PERIMETER WETLAND CAP

10 C-502

PROPOSED FRINGE WETLAND CAP

MW-GZA6/CW-4

MW-233

MW-232D

PROPOSED MONITORING WELL REPLACING FORMER GZA-5

PROPOSED TRANSITION UPLAND SOIL CAP TO FRINGE WETLAND CAP

MW-232D

MW-231D

MW-243

TRANSITION PERIMETER WETLAND CAP TO FRINGE WETLAND CAP 9 C-502

TEMPORARILY PLUG OUTFALL PIPES FROM DETENTION POND TO INNER COVE

CONSTRUCTION EXIT

6' CHAIN LINK FENCE TO REMAIN

EXISTING ACCESS GATE

EXISTING STORMWATER DETENTION BASIN

FORMER GARAGE

FORMER CARRIAGE HOUSE

AMTRAK MAINTENANCE FACILITY

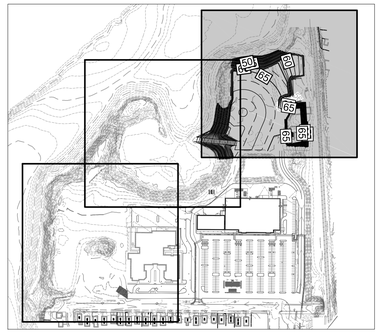
NBC SEWER EASEMENT

ACCESS ROAD EASEMENT

INNER COVE SEDIMENT PLACEMENT AREA

PROPOSED UPLAND SOIL CAP 8 C-502

CITY SEWER EASEMENT



INSET
NOT TO SCALE

NOTES:
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2. SEE SHEET 1 FOR LEGEND AND NOTES.

0' 20' 40' 60'
1" = 40'

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PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
PROPOSED SITE PLAN
SHEET 3 OF 3

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: AS SHOWN

PROJECT NUMBER: 3652140032

DRAWING NUMBER: **C-103**

SHEET NUMBER: **8 OF 10**

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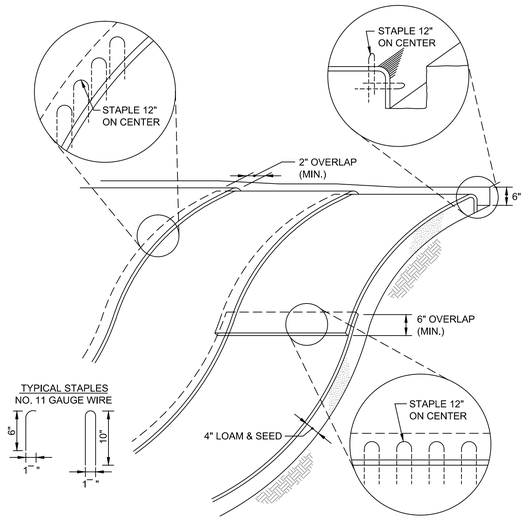


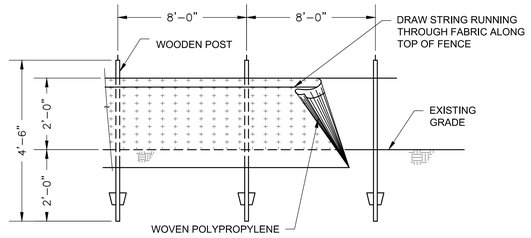
NOTES:

1. BEGIN AT THE TOP OF MATTING INSTALLATION AREA BY ANCHORING MATTING IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE MATTING DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF MATTINGS MUST BE STAPLED WITH A MINIMUM OF 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN MATTINGS MUST BE SPLICED DOWN THE SWALE, PLACE MATTING END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE MATTING IN A 6 INCH DEEP TRENCH.

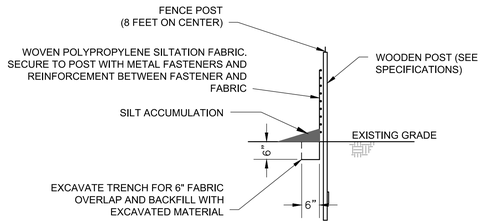
EROSION CONTROL MATTING SLOPE INSTALLATION

NTS

1 C-101 | 1 C-102 | 1 C-113



ELEVATION



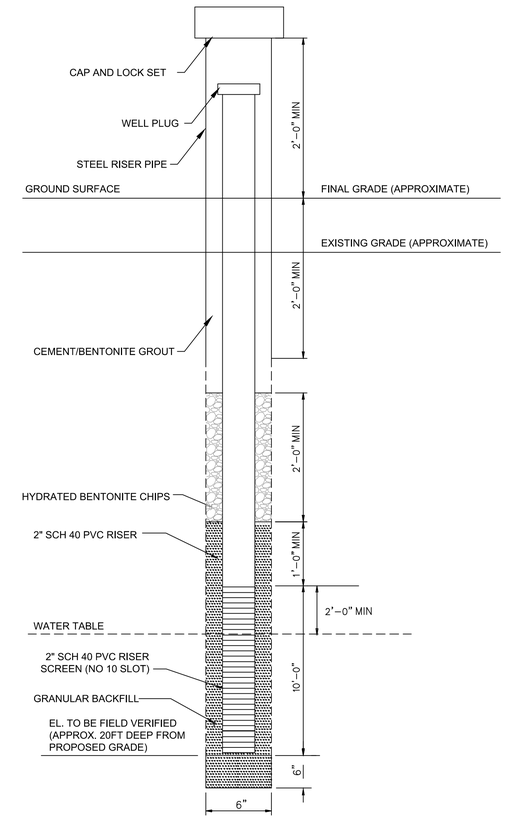
SECTION

NOTE:
WHERE REQUIRED AS SHOWN ON THE DRAWINGS.
SILTATION FENCE REINFORCED WITH HOG OR CHICKEN WIRE OR INTEGRAL PLASTIC MESH REINFORCING MAY BE USED.

SILT FENCE

NTS

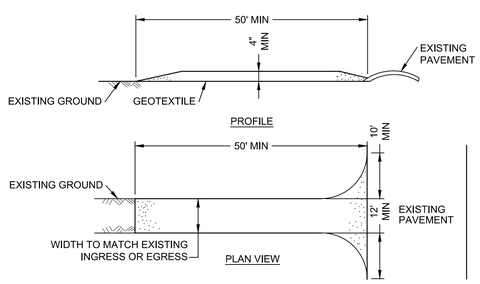
2 V-102 | 2 V-103 | 2 V-104



TYPICAL MONITORING WELL INSTALLATION

NTS

3 C-101 | 3 C-102



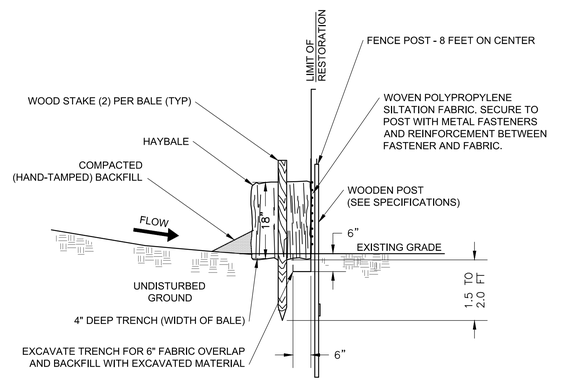
CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 2 INCH CRUSHED STONE OR GRAVEL.
2. LENGTH - NOT LESS THAN 50 FEET.
3. THICKNESS - NOT LESS THAN FOUR (4) INCHES.
4. WIDTH - TWELVE (12) FEET MINIMUM, BUT NOT LESS THAN THE THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FEET IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.

STABILIZED CONSTRUCTION ENTRANCE

NTS

4 V-102 | 4 V-104 | 4 C-101 | 4 C-102 | 4 C-103

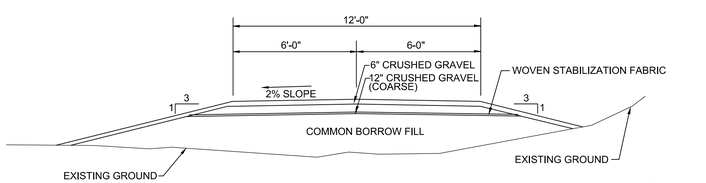


NOTE:
AUGMENTED SILTATION FENCE SHALL BE USED AT LOCATIONS AS SHOWN ON THE DRAWINGS .

AUGMENTED SILTATION FENCE

NTS

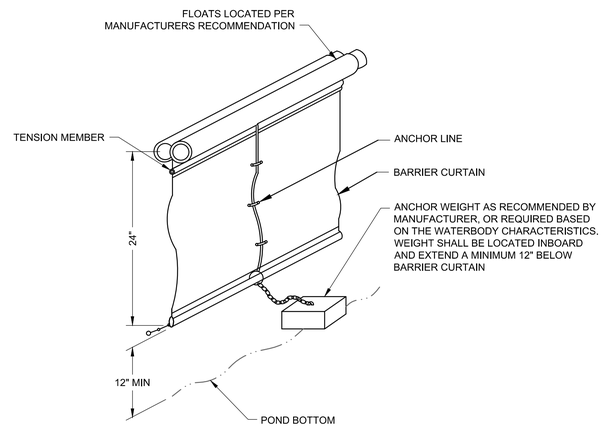
5 V-103 | 5 V-104 | 5 C-102 | 5 C-103



TEMPORARY GRAVEL ACCESS ROAD FROM PHASE III AREA TO INNER COVE

NTS

6 C-102 | 6 C-103



NOTES:

1. THE TURBIDY CURTAIN SHALL BE DEPLOYED PRIOR TO DISTURBING THE WATERBODY BANK SOILS.
2. THE TURBIDITY CURTAIN SHALL WITHSTAND THE WATERBODY FLOW CHARACTERISTICS.

TURBIDITY CURTAIN DETAIL

NTS

7 C-102 | 7 C-103

amec foster wheeler
AMEC FOSTER WHEELER
ENVIRONMENT & INFRASTRUCTURE, INC.
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REVISION	DATE	ISSUE / REVISION DESCRIPTION	ISSUED BY	APPROVED
2	03/11/2015	ISSUED FOR PERMITTING	DAA	RJB
1	02/13/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB
0	01/12/2015	DRAFT - ISSUED FOR CLIENT REVIEW	DAA	RJB

PROJECT:
TEXTRON, INC.
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
DETAILS
SHEET 1 OF 2

CLIENT:
TEXTRON

SEAL:

DESIGNED BY:	DRAWN BY:
DAA	DED
CHECKED BY:	SCALE:
DEH	NOT TO SCALE

PROJECT NUMBER: 3652140032

DRAWING NUMBER: **C-501**

SHEET NUMBER: **9 OF 10**

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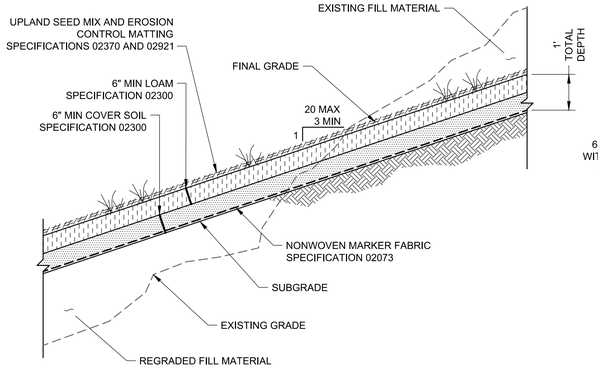
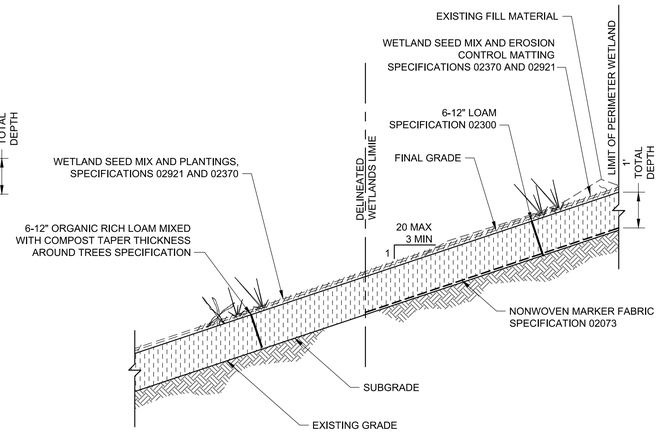


TYPICAL UPLAND SOIL CAP

NTS

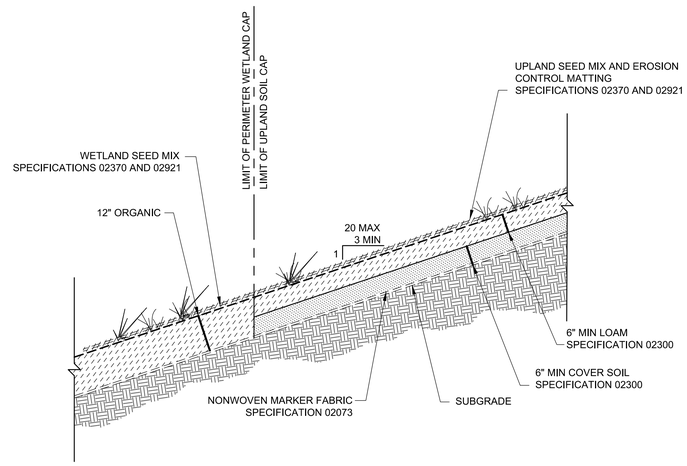
8 C-102 8 C-103



TYPIACAL TRANSITION DETAIL:
PERIMETER WETLAND CAP TO FRINGE WETLAND CAP

NTS

9 C-101 9 C-102 9 C-103



TYPICAL TRANSITION DETAIL:
UPLAND SOIL CAP TO PERIMETER WETLAND CAP

NTS

10 C-102 10 C-103

TYPICAL FRINGE WETLAND CAP

NTS

11 C-101 11 C-102 11 C-103

TYPICAL PERIMETER WETLAND CAP TOE DETAIL

NTS

12 C-106

TYPICAL PERIMETER WETLAND CAP

NTS

13 C-101 13 C-102 13 C-103

TYPIACAL TRANSITION DETAIL:
UPLAND SOIL CAP TO FRINGE WETLAND CAP

NTS

14 C-102

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PROJECT:
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FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE, PROVIDENCE, RI
REMEDIAL ACTION WORK PLAN

TITLE:
DETAILS
SHEET 2 OF 2

CLIENT:
TEXTRON

SEAL:

DESIGNED BY: DAA	DRAWN BY: DED
CHECKED BY: DEH	SCALE: NOT TO SCALE

PROJECT NUMBER: 3652140032

DRAWING NUMBER: **C-502**

SHEET NUMBER: **10 OF 10**

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