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New Bedford Harbor Superfund Site

U.S. Army Corps of Engineers New England District

Draft Final Intertidal Work Plan for West Zone 5

ACE-J23-35BG6000-M1-0011|1

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New Bedford Harbor Superfund Site

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Document history and status

Revision	Date	Description	By	Review	Approved
1	May 2020	Figures 3-2a, 302b, and 3-2c revised to reflect completed subtidal dredge extent. Sections 3.1, 3.2 and 3.3 updated.	MWM	PJW	ARS

Table of Contents

Figures

Tables

Appendix

Acronyms and Abbreviations

cy	cubic yards
EPA	U.S. Environmental Protection Agency
ft	foot/feet
Generic Work Plan	Draft Final Generic Upper Harbor Intertidal Work Plan Revision 1
GPS	Global Positioning System
IA	immunoassay
mg/kg	milligrams per kilogram
NAE	U.S. Army Corps of Engineers, New England District
NBHSS	New Bedford Harbor Superfund Site
PCB	polychlorinated biphenyl
PECC	pre-excavation confirmatory congener
RAL	remedial action level
ROD	Record of Decision
ROW	right of way
RTK	Real Time Kinematic
sf	square feet
TCL	target cleanup level
TSCA	Toxic Substances Control Act
UCL	upper confidence limit

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1.0 Introduction

This Work Plan for West Zone 5 provides information concerning shoreline remediation and restoration pursuant to the New Bedford Harbor Superfund Site (NBHSS), including maps and figures of the excavation areas, equipment access plans, sample locations, and existing and proposed wetland cover and topography. The *Draft Final Generic Upper Harbor Intertidal Work Plan Revision 1* (Generic Work Plan; Jacobs 2019a) describes the means and methods for intertidal excavation, material stabilization, drainage water management, transport and disposal of polychlorinated biphenyl (PCB)-contaminated intertidal sediments, restoration of excavated areas and post-remediation monitoring and maintenance. This zone-specific work plan provides additional detail and documents deviations from the procedures in the Generic Work Plan.

As described herein, certain areas of the sediment and soil on the parcels contain PCB contamination that exceeds the established target cleanup levels (TCLs) for intertidal sediment. The PCB TCLs are provided in the 1998 U.S. Environmental Protection Agency (EPA) Record of Decision (ROD) for the NBHSS (EPA 1998). The TCLs for intertidal shoreline areas in West Zone 5 are 25 milligrams per kilogram (mg/kg) for the top 1 foot (ft) (95% upper confidence limit [UCL] of the mean concentration), and 50 mg/kg below 1 ft landward of the mudflats (not-to-exceed value). This 25 mg/kg TCL has been applied because of the anticipated construction of a recreational public walking path along the Upper Harbor western shoreline. The TCL for Upper Harbor mudflats and subtidal areas is 10 mg/kg, which must be attained as an average on an Upper Harbor-wide basis. Sediment and soil with PCB concentrations exceeding the TCLs will be removed and disposed of in an off-site Toxic Substances Control Act (TSCA) permitted landfill. Following contaminated sediment removal, areas that originally supported vegetative cover will be backfilled with clean topsoil to the original elevation and restored with a similar vegetation type. Unvegetated areas (i.e., mudflats) will be backfilled as needed to stabilize the shoreline.

2.0 Parcel Description

The intertidal management area referred to as West Zone 5 is located on the western shore of the Upper New Bedford Harbor in New Bedford, MA. West Zone 5 consists of four parcels: 100-118, 100-117, 100-120, and 100-85; portions of each parcel except Parcel 100-120 will be remediated. A site location map showing the West Zone 5 parcels and the limits of the planned excavations is provided in Figure 2-1.

Parcel 100-118 is comprised of a former industrial building converted to residences in the western portion with a narrow area of undeveloped land and a parking area in the eastern portion. The shoreline consists of rip rap, low marsh, and mudflats. The parcel is bounded to the north by Manomet Street, to the west by a paved parking area, to the south by Parcel 100-117, and to the east by the Upper Harbor. Remediation of contaminated sediments will take place along the undeveloped shoreline within the parcel.

Parcel 100-117 is comprised of an industrial building on the western portion with a relatively narrow area of undeveloped land in the eastern portion. The shoreline of this parcel consists of rip rap, mudflats, and derelict wooden pilings. The parcel is bounded to the north by Parcel 100-118, to the west by a paved parking area, to the south by Parcel 100-120, and to the east by the Upper Harbor. Remediation of contaminated sediments will take place along the undeveloped shoreline, seaward (east) of the derelict wooden pilings.

Parcel 100-85 is comprised of industrial buildings in the northern portion and a parking area in the southern portion. The shoreline of this parcel consists of rip rap, low marsh, and mudflats. The parcel is bounded to the north by the Coffin Avenue Right of Way (ROW), to the west by a building on the adjacent parcel, to the south by Pierce

Mill Cove, and to the east by the Upper Harbor. Remediation of contaminated sediments will take place along the undeveloped shoreline within the parcel.

The existing wetland vegetation for West Zone 5 was surveyed in 2017. The mapped survey results and the outlines of the excavation areas are provided in Figure 2-2a through Figure 2-2c. Sediment and soil samples collected during the site investigation/characterization phase were analyzed for total PCBs by both immunoassay (IA) and congener methods. The analytical results summarized in Table 2-1a through Table 2-1c were used to support remediation planning. The PCB characterization sample locations used to delineate the extent of PCB contamination within West Zone 5 are shown in Figure 2-3a through Figure 2-3c. A subset of these locations were also designated as confirmatory sample locations, which are described further in Section 3.3.

3.0 Excavation

3.1 Site Preparation

Access to the portions of Parcels 100-118 and 100-85 requiring remediation will be through private property that is currently under access agreements obtained by EPA. The existing parking lot will be used to access the northern portion of Parcel 100-118. For the southern portion of Parcel 100-118 and Parcel 100-85, temporary roads will be built to create equipment access to the remediation areas. The temporary roads will be constructed using a geotextile base covered by either 12 inches of dense-grade aggregate or by construction mats. The use of aggregate or mats will be determined in the field when the roads are cleared. Approximately 500 linear feet (ft) of temporary access roads will be constructed. The roads will be approximately 15 ft wide. A construction site plan showing the excavation areas and temporary access roads is provided as Figure 3-1. Access to the portions of Parcel 100-117 requiring remediation will be addressed when the work is scheduled.

Prior to any site clearing or grubbing necessary to build the access road to the excavation areas, mature, non-invasive tree and shrub species will be marked in the field and preserved when possible during construction. Native tree and shrub inventories for Parcels 100-118 and 100-85 are included as Appendix A (a tree and shrub survey is not provided for Parcel 100-117 because the mudflat excavation area will be accessed from the water as part of the Area R subtidal dredging operations). Other vegetation will be cleared from the site as necessary to permit access road construction and remedial excavation. Construction access was designed to minimize disturbance of the property to the maximum extent practicable.

3.2 Excavation Plan

Using PCB data collected through multiple rounds of sampling, a 3-dimensional excavation model was developed as depicted in the West Zone 5 Excavation Plans in Figures 3-2a, 3-2b, and 3-2c. The horizontal and vertical extents of the excavations include all sample locations with total PCB concentrations exceeding TCLs (for non-mudflat locations), and mudflat locations with PCB concentrations exceeding the subtidal/mudflat remedial action level (RAL) of 30 mg/kg.[1] All of the 0-1 ft sample locations outside of the excavation area have total PCB concentrations below 25 mg/kg. The cut depth, areal extent of contamination and pre-excavation surface elevations for the excavation areas are shown on Figure 3-2a for Parcel 100-118, on Figure 3-2b for Parcel 100-117, and on Figure 3-2c for Parcel 100-85. The vertical extent of contamination was not delineated at the

[1] Location WS515 on Parcel 100-118 is included in the excavation area because it is located between two locations with total PCB >50 mg/kg, and location WS501 on Parcel 100-118 is included in the excavation area because it is adjacent to a mudflat location with total PCB >30 mg/kg.

north end of Parcel 100-118 or at the east end of Parcel 100-85 because refusal was encountered. The depth of the excavations in these areas is assumed to be at the bottom of the deepest sample interval. Depending on conditions encountered during excavation, the bottoms of the excavations in these areas may be lined with a geotextile. The total area to be excavated is approximately 20,583 square feet (sf) and has a corresponding volume of 933 cubic yards (cy). The eastern (seaward) edge of the excavation areas have been adjusted to match the landward extent of the completed, adjacent subtidal dredging.

3.3 Post Excavation Compliance

Confirmation of compliance with the TCLs will be based on pre-excavation confirmatory congener (PECC) sampling and collection of post-excavation survey data to demonstrate that the excavation achieved the horizontal and vertical design limits. The PECC sample locations shown in Figures 2-3a, 2-3b, and 2-3c include top-of-bank, excavation sidewall and excavation floor locations where PCB congener concentrations were previously determined to be below the TCLs. PECC sample results are shown in Tables 2-1a, 2-1b, and 2-1c. In areas where the excavation extends to the base of shoreline rip rap, top-of-bank PECC samples were collected immediately above the rip rap at approximate 100-ft intervals. PECC locations for saltmarsh areas are spaced at approximate 100-ft intervals except at the north end of Parcel 100-118 and the east end of Parcel 100-85, where sediment cores encountered refusal. Post-excavation confirmatory samples for mudflats that are subtidal after excavation will not be collected, as none of the subtidal confirmatory sampling program sample locations fall within the WZ5 mudflat boundaries.

Compliance survey locations are spaced at approximate 100-ft intervals along the excavation sidewalls and floors. Design elevation compliance measurements at the compliance survey locations will be made using a real-time kinematic (RTK) global positioning system (GPS) with vertical and horizontal accuracies of less than 0.1 ft. Compaction by heavy equipment after excavation will be avoided until target elevations are confirmed by RTK survey. Table 3-1 provides a survey control table to document the pre- and post-excavation compliance measurements and compliance survey locations are shown in Figure 3-3a through Figure 3-3c. Additional removal will be performed if a post-excavation elevation survey indicates that a PECC location was not excavated to the target elevation or horizontal extent. Any additional removal will be performed as described in Section 4.5 of the Generic Work Plan.

If the PECC approach is proven to be ineffective at a previous intertidal pilot test area (i.e., in East Zone 1 or West Zone 1, whichever is remediated first), then post-excavation confirmatory samples will be collected at the PECC locations, and the excavation will not be backfilled until it is confirmed to be below the TCLs.

4.0 Backfill

After verification that compliance with the TCLs has been met, the excavations will be backfilled with clean manufactured topsoil. The topsoil will meet the quality requirements identified in the *Draft Final Topsoil Acceptance Plan* (Jacobs 2019b). Backfill in saltmarsh areas will consist of 12 inches of topsoil to support vegetation regrowth and achieve the restoration design provided in Section 7.0. Where excavation depth exceeds 1 ft, a 3-inch minus clean gravel substrate will be placed to within 1 ft of the target grade and topsoil will be placed on top of the substrate to bring the surface to the target elevation. Excavated mudflats will be backfilled with gravel as needed to provide slope stability or drainage. A specification for the gravel backfill is provided in the Generic Work Plan.

The gravel substrate and topsoil will be delivered to the restoration areas by over-the-road dump trucks and offloaded into stockpiles near the excavation areas. A clean, decontaminated all-terrain dump truck or tracked excavator will transport the topsoil for spreading. Post-backfill saltmarsh topography will closely match the pre-excavation topography with a tolerance of +/- 0.3 ft as described in Section 7.0. The surface may be restored to an elevation of 0.1 to 0.2 ft. above the planned grade to allow for natural soil compaction. During the restoration process, the elevation of the placed topsoil will be checked periodically with the GPS Rover and with the excavator bucket. Elevation measurements will be taken after each area is backfilled, prior to relocating the excavator.

5.0 Schedule

The anticipated durations of the remedial activities included in this Work Plan are listed below. A more detailed construction planning schedule will be provided as Appendix C prior to initiation of field activities.

Activity	Anticipated Duration
Excavation	1 week
Restoration	1 week
After Action Report	3 months

6.0 Air Monitoring

The evaluation of existing PCB congener data (Tables 2-1a, 2-1b, 2-1c) indicates that the maximum PCB concentration at Parcel 100-118 is 598 mg/kg. Particulate and airborne PCB monitoring will be conducted in accordance with the guidelines provided in the *NBHSS Draft Final Ambient Air Monitoring Plan for Remediation Activities Revision 2* (Jacobs 2018a).

7.0 Restoration

All excavated areas except mudflats will be backfilled, regraded, and revegetated to best replicate the pre-remediation conditions as outlined in the Generic Work Plan (Jacobs 2019a). Mudflats will be backfilled to pre-excavation elevations to approximately 10 ft seaward of the low marsh/mudflat boundary, then sloped downward to meet the existing harbor bottom. As specified in the Generic Work Plan, upland areas impacted by remediation activities will be seeded with conservation seed mix. Any trees removed as part of access road construction or excavation will be replaced at the same or nearby suitable location. A pre-construction tree and shrub inventory of plants within the excavation area and access road area is included in Appendix A.

Proposed restored vegetation types within the remediation areas are shown in plan view in Figure 7-1a, Figure 7-1b, and Figure 7-1c. A conceptual cross section is provided in Figure 7-2 and construction cross sections are provided in Appendix B. Tree and shrub species identified for restoration are included in the Shrub Area Plantings notes included in Figures 7-1a and 7-1c. The existing and proposed post-restoration acreages of each cover type are included in Tables 7-1a, 7-1b, and 7-1c, and shrub restoration summaries are provided in Tables 7-2a and 7-2b.

Planting of trees, shrubs and 2-inch bare-root salt grass plugs will be conducted after excavation and backfill in accordance with favorable weather conditions and within the planting season from approximately April 15 to

June 30, 2019 or in the early fall (Jacobs 2019a). Salt grass plants will be obtained from a nursery that that can provide plugs grown from a Northeastern U.S. genotype seed stock.

Herbivory deterrents will be used to protect the seedlings during the establishment period (Jacobs 2019a). A combination fence and rope grid system, similar to the one installed at the Pierce Mill Cove intertidal restoration area, will be constructed (Jacobs, 2018b). If unforeseen conditions are identified that could affect the ability of the restoration to achieve the success standards adopted for the program, appropriate adaptive management measures will be developed and implemented in coordination with the U.S. Army Corps of Engineers, New England District (NAE) and EPA. Monitoring and maintenance in restored areas will be performed as described in the Generic Work Plan (Jacobs 2019a). At the conclusion of all restoration activities, final vegetation and topographic surveys will be conducted to document the as-built elevation and vegetative cover conditions.

8.0 References

U.S. Environmental Protection Agency (EPA). 1998 (September). *Record of Decision for the Upper and Lower Harbor Operable Unit, New Bedford Harbor Superfund Site*. USEPA Region 1 – New England.

Jacobs. 2019a (May). *Draft Final Generic Upper Harbor Intertidal Work Plan Revision 1*. ACE-J23-35BG2000-M1-0109.

——— 2019b (January). *Draft Final Topsoil Acceptance Plan*. ACE J23 35BG2000 M1-0076.

——— 2018a (April). *Draft Final Ambient Air Monitoring Plan for Remediation Activities Revision 2*. ACE-J23-35BG2000-M17-0034.

——— 2018b (November). *NBHSS Draft Final Pierce Mill Cove Herbivory Control Plan.* ACE-J23-35BG2000-M17-0040.

Figures

100-118

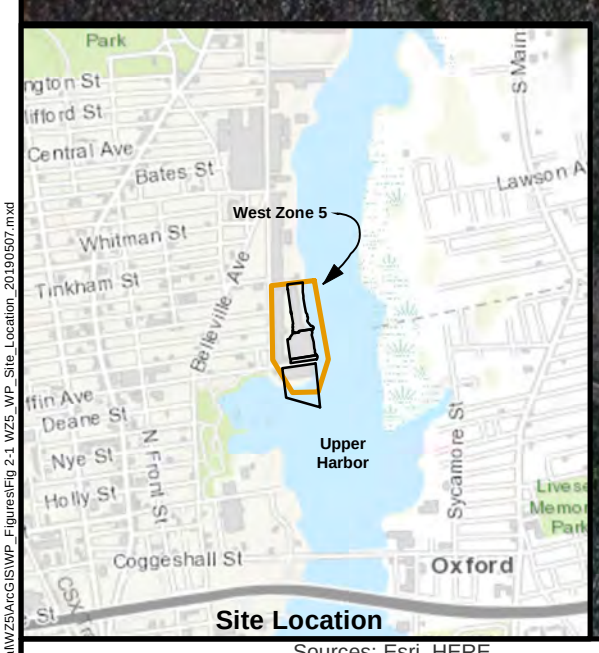
100-117

100-120

100-85

New Bedford Harbor

Pierce Mill Cove



Legend

- Proposed Limits of Excavation
- West Zone 5 Management Area
- Parcel Boundary

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo,

Basemap Data Source: MassGIS, ESRI
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 150 300 Feet

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Intertidal West Zone 5
Site Location and Features

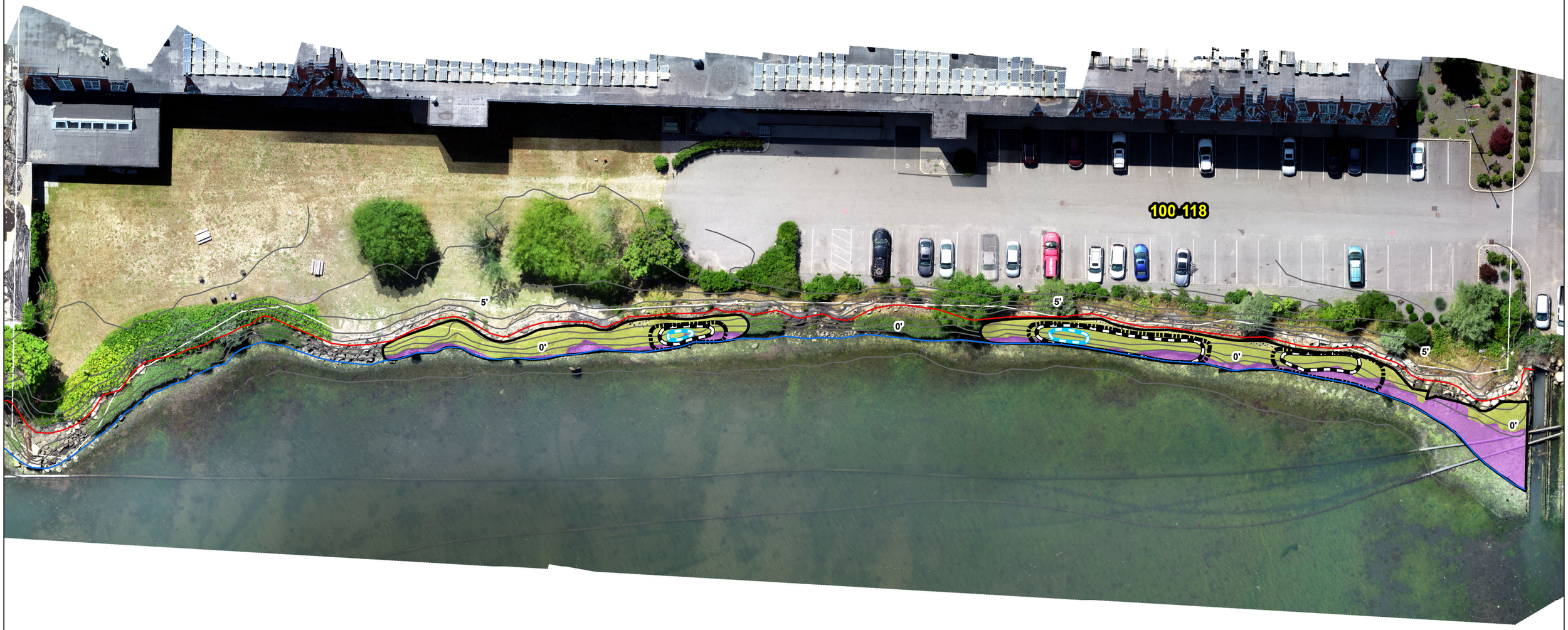
New Bedford Harbor Superfund Site

March 2019 **Figure 2-1**

Path: C:\Users\scottgal\Documents\NBH\35BG.1001\20180901_Intertidal\WZ5\ArcGIS\WP_Figures\Fig 2-1 WZ5_WP_Site_Location_20190507.mxd

Notes:

Existing vegetative cover was surveyed by Nearview, LLC (October 2017).



Legend

- Mean Lower Low Water
- Mean Higher High Water
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 1-foot Contour
- Parcel Boundary
- Mudflat
- Beach
- Low Marsh

0 50 100 Feet

Basemap Data Source:
Green Seal Environmental (2018)

March 2019

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-118
Existing Vegetation, Topography, and Excavation Areas

New Bedford Harbor Superfund Site

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Figure 2-2a

Notes:

Existing vegetative cover was surveyed by Nearview, LLC (October 2017).

Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- Parcel Boundary
- Mean Lower Low Water
- Mean Higher High Water
- 1-foot Contour
- Mudflat

0 — 50 — 100 Feet

Basemap Data Source:
Green Seal Environmental (2018)

March 2019

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-117 Existing Vegetation, Topography, and Excavation Areas

New Bedford Harbor Superfund Site

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Figure 2-2b

Notes:

Existing vegetative cover was surveyed by Nearview, LLC (October 2017).

Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- Mean Lower Low Water
- Mean Higher High Water
- Parcel Boundary
- 1-foot Contour
- Beach
- Low Marsh
- Mudflat

0 50 100 Feet

Basemap Data Source:
Green Seal Environmental

March 2019

Vertical Datum:
NAVD88

Intertidal West Zone 5, Parcel 100-120, 100-85, ROW
Existing Vegetation and Topography

New Bedford Harbor Superfund Site

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Figure 2-2c

Legend

- PCB Characterization and Confirmatory Sample Location
- PCB Characterization Sample Location
- Proposed Limits of Excavation
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

0 40 80 Feet

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

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Intertidal West Zone 5
Parcel 100-118
Sampling Locations with Excavation Footprint
(0-1 ft Depth Interval)

New Bedford Harbor Superfund Site

March 2019 **Figure 2-3a**

Path: C:\Users\scottgal\Documents\NBH\35BG\1001\20180901_IntertidalWZ5\ArcGIS\WP_Figures\Fig 2-3a WZ5_WP_Parcels_100_118_Sampling_Locations_with Excavation_Footprint_20190507.mxd

Legend

- PCB Characterization and Confirmatory Sample Location
- PCB Characterization Sample Location
- Proposed Limits of Excavation
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

0 20 40 60 Feet

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

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Intertidal West Zone 5
Parcel 100-117
Sampling Locations with Excavation Footprint
(0-1 ft Depth Interval)

New Bedford Harbor Superfund Site

March 2019 **Figure 2-3b**

Path: C:\Users\scottga\Documents\NBH\335BG-1001\20180901_Intertidal\WZ5\ArcGIS\WP_Figures\WZ5_WP_Fig2_3b_Parcels_100_117_Sampling_Locations_with_Excavation_Footprint_20190311.mxd

Legend

- PCB Characterization and Confirmatory Sample Location
- PCB Characterization Sample Location
- Proposed Limits of Excavation
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

0 20 40 60 Feet

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

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Intertidal West Zone 5
Parcels 100-120, 100-85, ROW
Sampling Locations with
Excavation Footprint
(0-1 ft Depth Interval)

New Bedford Harbor Superfund Site

March 2019 **Figure 2-3c**

Path: C:\Users\scottgal\Documents\NBH135BG100120180901_Intertidal\WZ5\ArcGIS\WP_Figures\WZ5_WP_Fig2_3c_Parcels_100_120_85_ROW_Sampling_Locations_with_Excavation_Footprint_20190311.mxd

105-208
105-207
105-209
105-183
Manomet Street
Riverside Ave
100-118
100-117
100-120
New Bedford Harbor
Coffin Ave
100-84
100-83
100-140
100-85
USGS, MassGIS

Legend

- Temporary Gravel Access Road
- Existing Access
- Proposed Limits of Excavation
- MHHW (1.99ft NAVD88)
- MLLW (-1.97ft NAVD88)
- Parcel Boundary

N

Aerial Photography Green Seal 2018

0 50 100 Feet

1:1,320

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Intertidal West Zone 5 Construction Site Plan

New Bedford Harbor Superfund Site

March 2019 | Figure 3-1

Path: C:\Users\scottnal\Documents\NBH\35BG1001\20180901_Intertidal\WZ5\ArcGIS\WP_Figures\Fig 3-1 WZ5_WP_Construction_Site_Plan_20190507.mxd

105-208

105-207

105-183

100-118

Legend

- Subtidal Dredge Boundary
- MHHW (1.99 ft NAVD88)
- MLLW (-1.97 ft NAVD88)
- Parcel Boundary

Feet of Sediment To Remove

- 4
- 3
- 2
- 1

2.1 Pre-Excavation Elevations NAVD88 ft. (Green Seal, June, 2018)

0 40 80 Feet

Pre-Excavation MHHW and MLLW Elevations NAVD88 ft. (Green Seal, June, 2018)

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Intertidal West Zone 5
Parcel 100-118
Excavation Plan
Showing Cut Depths and Pre-Excavation Elevations

New Bedford Harbor Superfund Site

April 2020 **Figure 3-2a**

Path: C:\Users\ScottGA\Documents\NBH35BG1001\20180901_Intertidal\WZ5\ArcGIS\WP_Figures\WZ5_WP_Fig3_2a_Parcel_100-118_Excavation_Plan_20200420.mxd

Legend

- Subtidal Dredge Boundary
- MHHW (1.99 ft NAVD88)
- MLLW (-1.97 ft NAVD88)
- Parcel Boundary

Feet of Sediment To Remove

- 2
- 1

2.1 Pre-Excavation Elevations NAVD88 ft. (Green Seal, June, 2018)

0 30 60 Feet

Pre-Excavation MHHW and MLLW Elevations NAVD88 ft. (Green Seal, June, 2018)

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Intertidal West Zone 5
Parcels 100-117
Excavation Plan
Showing Cut Depths and
Pre-Excavation Elevations

New Bedford Harbor Superfund Site

April 2020 **Figure 3-2b**

Path: C:\Users\ScottGA\Documents\NBH35BG100120180901_Intertidal\WZ5\ArcGIS\WP_Figures\WZ5_WP_Fig3_2b_Parcel_100-117_Excavation_Plan_20200420.mxd

Legend

- Subtidal Dredge Boundary
- MHHW (1.99 ft NAVD88)
- MLLW (-1.97 ft NAVD88)
- Parcel Boundary

Feet of Sediment to Remove

5	2
4	1
3	

2.1 Pre-Excavation Elevations NAVD88 ft. (Green Seal, May, 2018)

Pre-Excavation MHHW and MLLW Elevations NAVD88 ft. (Green Seal, May, 2018)

0 30 60 Feet

Basemap Data Source: MassGIS, ESRI

April 2020

Intertidal West Zone 5
Parcel 100-85
Excavation Plan
Showing Cut Depths and Pre-Excavation Elevations

New Bedford Harbor Superfund Site

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Figure 3-2c

Path: C:\Users\ScottGA\Documents\NBH335BG100120180901_IntertidalWZ5\ArcGIS\WP_Figures\WZ5_WP_Fig3_2c_Parcel_100-120_85_ROW_Excavation_Plan_20200420.mxd

105-183
105-208
105-207
105-209
Manomet Street
WS557
WS538
WS543
WS558
WS539
WS505
WS540
WS559
INT248
WS509
WS512
100-118
WS560
WS515
WS541
S-919
WS561
WS542
100-117

Legend

- Compliance Survey Location
- Proposed Limits of Excavation
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

Basemap Data Source:
Green Seal (2018); MassGIS (2014)

N

0 40 80
Feet

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Intertidal West Zone 5
Parcel 100-118
Compliance Survey Locations with Excavation Footprint
(0-1 ft Depth Interval)

New Bedford Harbor Superfund Site

May 2019

Figure 3-3a

Path: C:\Users\scottgal\Documents\NBH\35BG.1001\20180901_Intertidal\WZ5\ArcGIS\WP_Figures\Fig 3-3a WZ5_WP_Parcels_100_118_Compliance_Sampling_Locations_with Excavation_Footprint_20190531.mxd

Legend

- Compliance Survey Location
- Proposed Limits of Excavation
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

Basemap Data Source:
Green Seal (2018); MassGIS (2014)

0 20 40 60
Feet

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Intertidal West Zone 5
Parcel 100-117
Compliance Survey Locations with Excavation Footprint
(0-1 ft Depth Interval)

New Bedford Harbor Superfund Site

May 2019

Figure 3-3b

Path: C:\Users\scottga\Documents\NBH\35BG1001\20180901_IntertidalWZ5\ArcGIS\WP_Figures\Fig 3-3b WZ5_WP_Parcels_100_117_Compliance_Sampling_Locations_with Excavation_Footprint_20190531.mxd

100-117

100-120

100-85

WS550

WS555

WS551

WS534B

WS565

WS566

WS552

S-116

WS554

WS539

WS567

WS556

WS568

WS553

Legend

- Compliance Survey Location
- Proposed Limits of Excavation
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

Basemap Data Source:
Green Seal (2018); MassGIS (2014)

N

0 20 40 60
Feet

JACOBS™

Intertidal West Zone 5
Parcel 100-85
Compliance Survey Locations with Excavation Footprint
(0-1 ft Depth Interval)

New Bedford Harbor Superfund Site

May 2019

Figure 3-3c

Path: C:\Users\scottgat\Documents\NBH\35BG\1001\20180901_IntertidalWZ5\ArcGIS\WP_Figures\Fig 3-3c WZ5_WP_Parcels_100_120_85_ROW_Compliance_Sampling_Locations_with Excavation_Footprint_20190531.mxd

Shrub Restoration Area Plantings
Area 1:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

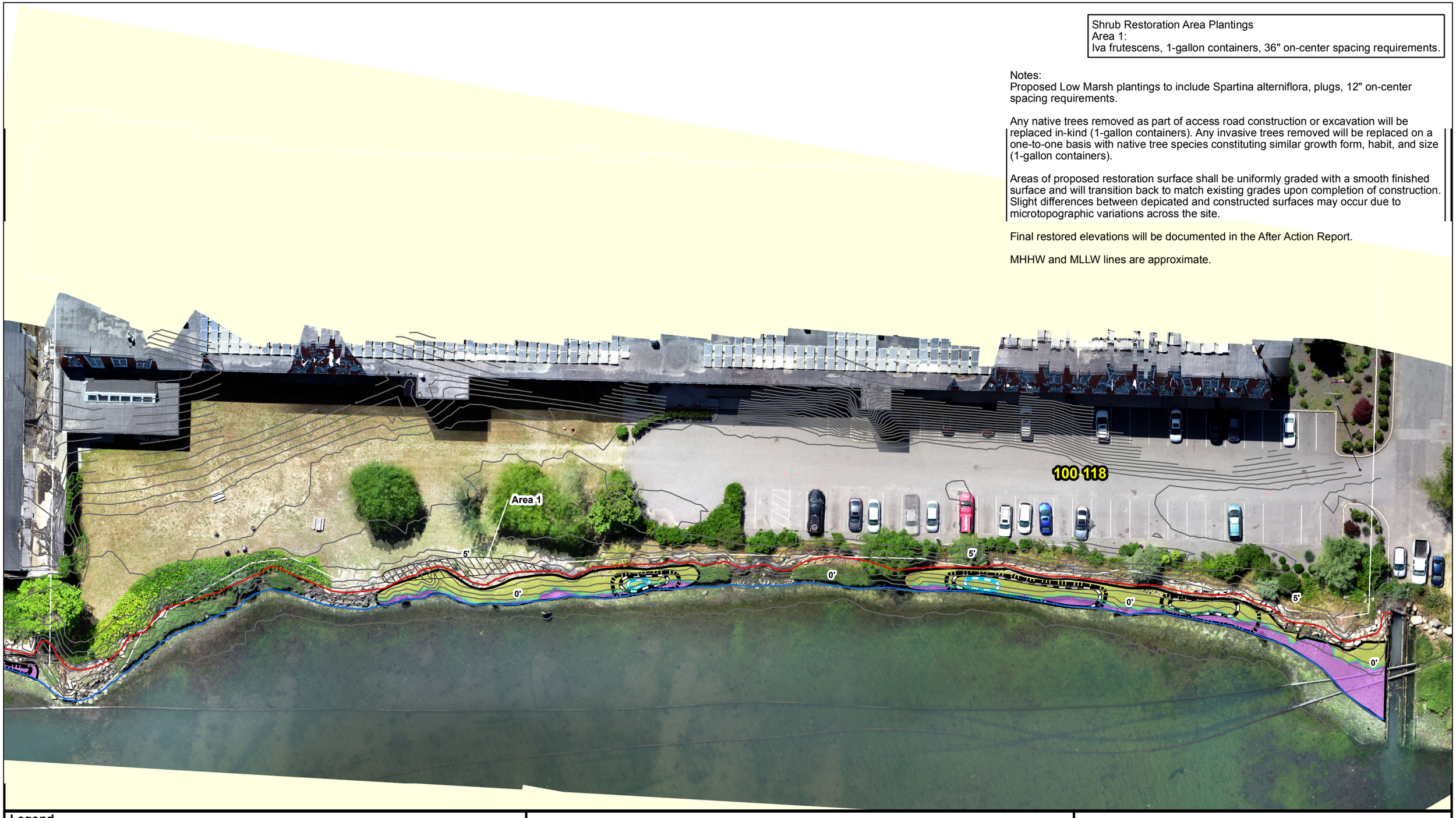
Notes:
Proposed Low Marsh plantings to include Spartina alterniflora, plugs, 12" on-center spacing requirements.

Any native trees removed as part of access road construction or excavation will be replaced in-kind (1-gallon containers). Any invasive trees removed will be replaced on a one-to-one basis with native tree species constituting similar growth form, habit, and size (1-gallon containers).

Areas of proposed restoration surface shall be uniformly graded with a smooth finished surface and will transition back to match existing grades upon completion of construction. Slight differences between depicated and constructed surfaces may occur due to microtopographic variations across the site.

Final restored elevations will be documented in the After Action Report.

MHHW and MLLW lines are approximate.



Legend

- Proposed Coir Log
- Mean Lower Low Water
- Mean Higher High Water
- 1-foot Contour
- Parcel Boundary
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- Proposed Shrub Restoration
- Proposed Beach
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability

0 50 100 Feet

Basemap Data Source:
Green Seal Environmental (2018)

March 2019

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-118
Proposed Wetland Cover Types and Topography

New Bedford Harbor Superfund Site

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Figure 7-1a

Notes:

Any native trees removed as part of access road construction or excavation will be replaced in-kind (1-gallon containers). Any invasive trees removed will be replaced on a one-to-one basis with native tree species constituting similar growth form, habit, and size (1-gallon containers).

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- Mean Higher High Water
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- Parcel Boundary
- Minimal Backfill as Needed for Drainage or Slope Stability

0 50 100 Feet

Basemap Data Source:
Green Seal Environmental (2018)

March 2019

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-117
Proposed Wetland Cover Types and Topography

New Bedford Harbor Superfund Site

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Figure 7-1b

Shrub Restoration Area Plantings
Area 1:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Proposed Low Marsh plantings to include Spartina alterniflora, plugs, 12" on-center spacing requirements.

Any native trees removed as part of access road construction or excavation will be replaced in-kind (1-gallon containers). Any invasive trees removed will be replaced on a one-to-one basis with native tree species constituting similar growth form, habit, and size (1-gallon containers).

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MHHW and MLLW lines are approximate.

Legend

- Proposed Coir Log
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- Proposed Shrub Restoration Area
- Parcel Boundary
- Proposed Beach
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability

0 50 100 Feet

March 2019

Basemap Data Source:
Green Seal Environmental (2018)

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-85
Proposed Wetland Cover Types and Topography

New Bedford Harbor Superfund Site

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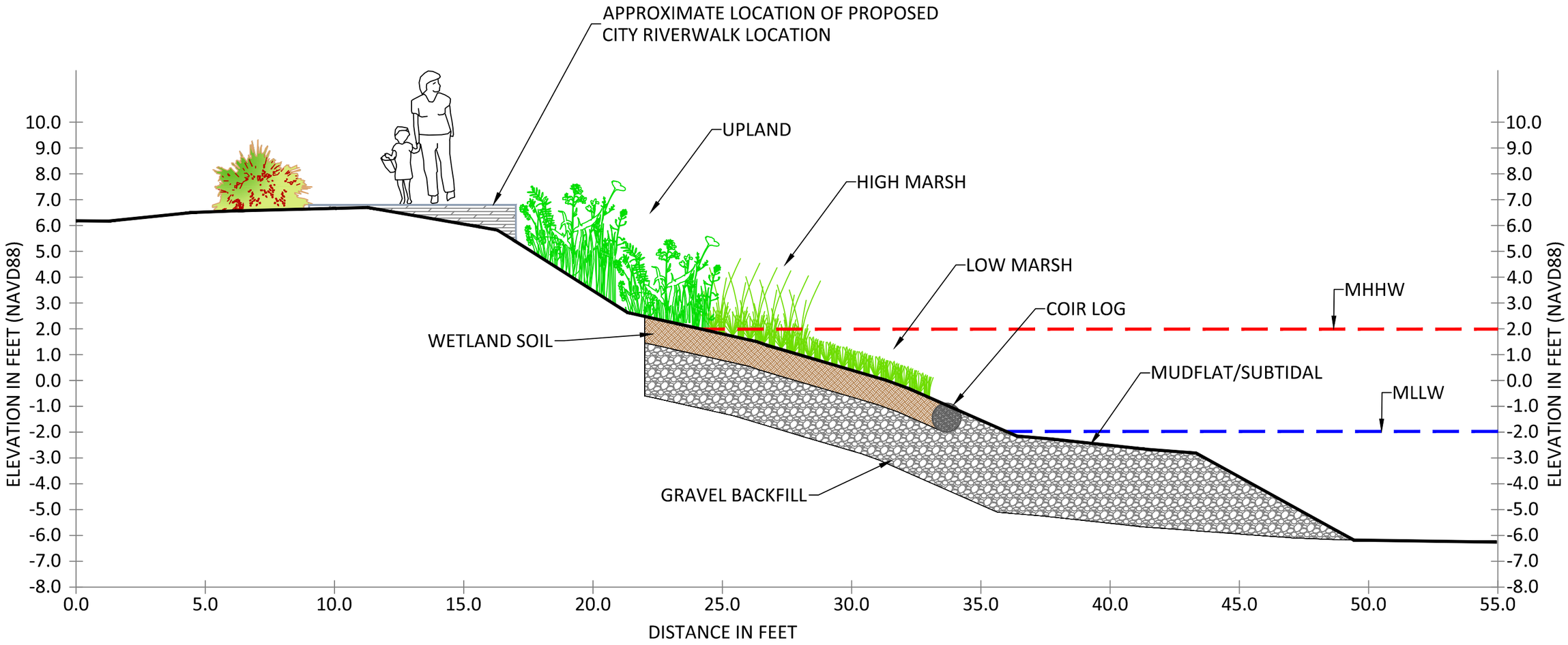
Figure 7-1c



0 4 feet

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West Zone 5
Conceptual Cross Section

New Bedford Harbor Superfund Site

May 2019 | Figure 7-2

Tables

Table 2-1a
Pre-Excavation PCB Characterization Sample Results for Parcel 100-118

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
100-118	Upland	S-15L-INT247-00-10	INT247	0.0	1.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Upland	S-15L-INT247-10-20	INT247	1.0	2.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Saltmarsh	S-15L-INT248-00-10	INT248	0.0	1.0	7/10/2015	PCB from Immunoassay (Aroclor 1254)	16.20	D
100-118	Saltmarsh	S-15L-INT248-10-20	INT248	1.0	2.0	7/10/2015	PCB from Immunoassay (Aroclor 1254)	181.10	D
100-118	Saltmarsh	S-15L-INT248-20-30	INT248	2.0	3.0	7/10/2015	PCB from Immunoassay (Aroclor 1254)	78.50	D
100-118	Saltmarsh	S-15L-INT248-30-35	INT248	3.0	3.5	7/10/2015	PCB from Immunoassay (Aroclor 1254)	34.60	D
100-118	Upland	S-15L-INT249-00-10	INT249	0.0	1.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Upland	S-15L-INT249-10-20	INT249	1.0	2.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Saltmarsh	S-15L-INT250-00-10	INT250	0.0	1.0	7/10/2015	PCB from Immunoassay (Aroclor 1254)	7.80	D
100-118	Saltmarsh	S-15L-INT250-10-20	INT250	1.0	2.0	7/10/2015	PCB from Immunoassay (Aroclor 1254)	8.90	
100-118	Saltmarsh	S-15L-INT250-20-30	INT250	2.0	3.0	7/10/2015	Total 139 PCB cong (excl non-detects)	35.00	
100-118	Saltmarsh	S-15L-INT250-30-40	INT250	3.0	4.0	7/10/2015	PCB from Immunoassay (Aroclor 1254)	57.10	D
100-118	Saltmarsh	S-15L-INT250-40-46	INT250	4.0	4.6	7/10/2015	PCB from Immunoassay (Aroclor 1254)	11.50	D
100-118	Saltmarsh	S-15L-INT250-46-53	INT250	4.6	5.3	7/10/2015	PCB from Immunoassay (Aroclor 1254)	0.80	
100-118	Upland	S-15L-INT251-00-10	INT251	0.0	1.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	
100-118	Upland	S-15L-INT251-10-20	INT251	1.0	2.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Upland	S-15L-INT252-00-10	INT252	0.0	1.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Upland	S-15L-INT252-10-20	INT252	1.0	2.0	7/8/2015	PCB from Immunoassay (Aroclor 1254)	0.50	U
100-118	Mudflat	S-15G-INT253-00-10	INT253	0.0	1.0	8/13/2015	PCB from Immunoassay (Aroclor 1254)	22.80	
100-118	Mudflat	S-15G-INT253-10-20	INT253	1.0	2.0	8/13/2015	PCB from Immunoassay (Aroclor 1254)	9.50	
100-118	Mudflat	S-15G-INT253-20-30	INT253	2.0	3.0	8/13/2015	PCB from Immunoassay (Aroclor 1254)	2.60	
100-118	Mudflat	S-15G-INT253-30-40	INT253	3.0	4.0	8/13/2015	Total 139 PCB cong (excl non-detects)	11.00	
100-118	Mudflat	S-15G-INT253-40-50	INT253	4.0	5.0	8/13/2015	PCB from Immunoassay (Aroclor 1254)	7.40	
100-118	Upland	S-3812-0.0-.3	S-3812	0.0	0.3	11/2/2001	Total 18 NOAA PCB cong (excl non-detects)	0.70	
100-118	Upland	S-3812-.3-1.0	S-3812	0.3	1.0	11/2/2001	Total 18 NOAA PCB cong (excl non-detects)	7.80	
100-118	Upland	S-3812-1.0-1.5	S-3812	1.0	1.5	11/2/2001	Total 18 NOAA PCB cong (excl non-detects)	6.24	
100-118	Upland	S-3812-1.5-2.0	S-3812	1.5	2.0	11/2/2001	Total 18 NOAA PCB cong (excl non-detects)	2.16	
100-118	Upland	S-3813-0.0-1.0	S-3813	0.0	1.0	10/19/2001	Total 18 NOAA PCB cong (excl non-detects)	0.26	
100-118	Saltmarsh	S-0919-1	S-919	0.0	1.0	10/23/2000	Total 18 NOAA PCB cong (excl non-detects)	598.00	
100-118	Saltmarsh	S-0919-1DUP	S-919	0.0	1.0	10/23/2000	Total 18 NOAA PCB cong (excl non-detects)	21.06	
100-118	Saltmarsh	S-0919-2	S-919	1.0	2.0	10/23/2000	Total 18 NOAA PCB cong (excl non-detects)	17.68	
100-118	Mudflat	S-0921-1	S-921	0.0	1.0	10/23/2000	Total 18 NOAA PCB cong (excl non-detects)	31.20	
100-118	Mudflat	S-WS501-18FSP12-00-07	WS501	0.0	0.7	8/28/2018	Total 209 PCB cong (excl non-detects)	25.8	
100-118	Saltmarsh	S-WS503-18FSP12-00-10	WS503	0.0	1.0	8/21/2018	Total 209 PCB cong (excl non-detects)	11.8	
100-118	Saltmarsh	S-WS503-18FSP12-10-20	WS503	1.0	2.0	8/21/2018	PCB from Immunoassay (Aroclor 1254)	14	JD
100-118	Saltmarsh	S-WS503-18FSP12-20-30	WS503	2.0	3.0	8/21/2018	Total 209 PCB cong (excl non-detects)	84.6	
100-118	Upland	S-WS504-18FSP12-00-10	WS504	0.0	1.0	8/14/2018	Total 209 PCB cong (excl non-detects)	0.719	
100-118	Upland	S-WS504-18FSP12-10-20	WS504	1.0	2.0	8/14/2018	PCB from Immunoassay (Aroclor 1254)	6.4	J
100-118	Saltmarsh	S-WS505-18FSP12-00-10	WS505	0.0	1.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	57	JD
100-118	Saltmarsh	S-WS505-18FSP12-10-20	WS505	1.0	2.0	9/25/2018	Total 209 PCB cong (excl non-detects)	24.6	
100-118	Saltmarsh	S-WS505-18FSP12-20-25	WS505	2.0	2.5	9/25/2018	Total 209 PCB cong (excl non-detects)	21.4	
100-118	Saltmarsh	S-WS506-18FSP12-00-10	WS506	0.0	1.0	8/21/2018	PCB from Immunoassay (Aroclor 1254)	9.6	J
100-118	Saltmarsh	S-WS506-18FSP12-10-20	WS506	1.0	2.0	8/21/2018	PCB from Immunoassay (Aroclor 1254)	24	JD
100-118	Saltmarsh	S-WS506-18FSP12-20-30	WS506	2.0	3.0	8/21/2018	PCB from Immunoassay (Aroclor 1254)	92	JD
100-118	Upland	S-WS508-18FSP12-00-10	WS508	0.0	1.0	8/14/2018	Total 209 PCB cong (excl non-detects)	4.59	

Table 2-1a
Pre-Excavation PCB Characterization Sample Results for Parcel 100-118

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
100-118	Upland	S-WS508-18FSP12-10-20	WS508	1.0	2.0	8/14/2018	PCB from Immunoassay (Aroclor 1254)	9.4	J
100-118	Saltmarsh	S-WS509-18FSP12-00-10	WS509	0.0	1.0	10/5/2018	Total 209 PCB cong (excl non-detects)	20.8	
100-118	Saltmarsh	S-WS509-18FSP12-10-20	WS509	1.0	2.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	7.9	J
100-118	Saltmarsh	S-WS509-18FSP12-20-30	WS509	2.0	3.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	5.7	J
100-118	Saltmarsh	S-WS509-18FSP12-30-40	WS509	3.0	4.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	4.2	J
100-118	Saltmarsh	S-WS510-18FSP12-00-10	WS510	0.0	1.0	8/21/2018	Total 209 PCB cong (excl non-detects)	21.5	
100-118	Saltmarsh	S-WS510-18FSP12-10-20	WS510	1.0	2.0	8/21/2018	Total 209 PCB cong (excl non-detects)	7.65	
100-118	Saltmarsh	S-WS510-18FSP12-20-30	WS510	2.0	3.0	8/21/2018	PCB from Immunoassay (Aroclor 1254)	2.6	J
100-118	Saltmarsh	S-WS510-18FSP12-30-40	WS510	3.0	4.0	8/21/2018	PCB from Immunoassay (Aroclor 1254)	17	JD
100-118	Saltmarsh	S-WS512-18FSP12-00-10	WS512	0.0	1.0	10/4/2018	Total 209 PCB cong (excl non-detects)	27.8	
100-118	Saltmarsh	S-WS512-18FSP12-10-20	WS512	1.0	2.0	10/4/2018	PCB from Immunoassay (Aroclor 1254)	1.8	J
100-118	Saltmarsh	S-WS512-18FSP12-20-30	WS512	2.0	3.0	10/4/2018	PCB from Immunoassay (Aroclor 1254)	0.34	J
100-118	Saltmarsh	S-WS512-18FSP12-30-40	WS512	3.0	4.0	10/4/2018	PCB from Immunoassay (Aroclor 1254)	0.81	J
100-118	Upland	S-WS514-18FSP12-00-10	WS514	0.0	1.0	8/14/2018	Total 209 PCB cong (excl non-detects)	0.0893	
100-118	Upland	S-WS514-18FSP12-10-20	WS514	1.0	2.0	8/14/2018	PCB from Immunoassay (Aroclor 1254)	4.7	J
100-118	Saltmarsh	S-WS515-18FSP12-00-10	WS515	0.0	1.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	40	JD
100-118	Saltmarsh	S-WS515-18FSP12-10-20	WS515	1.0	2.0	9/25/2018	Total 209 PCB cong (excl non-detects)	17.9	
100-118	Saltmarsh	S-WS515-18FSP12-20-30	WS515	2.0	3.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	2.2	J
100-118	Saltmarsh	S-WS515-18FSP12-30-40	WS515	3.0	4.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	6.1	J
100-118	Upland	S-WS516-18FSP12-00-10	WS516	0.0	1.0	8/14/2018	Total 209 PCB cong (excl non-detects)	0.0207	
100-118	Upland	S-WS516-18FSP12-10-20	WS516	1.0	2.0	8/14/2018	PCB from Immunoassay (Aroclor 1254)	10	J
100-118	Upland	S-WS518-18FSP12-00-10	WS518	0.0	1.0	8/14/2018	Total 209 PCB cong (excl non-detects)	0.056	
100-118	Upland	S-WS518-18FSP12-10-20	WS518	1.0	2.0	8/14/2018	PCB from Immunoassay (Aroclor 1254)	7.7	J
100-118	Upland	S-WS519-18FSP12-00-10	WS519	0.0	1.0	8/15/2018	Total 209 PCB cong (excl non-detects)	0.141	
100-118	Upland	S-WS519-18FSP12-10-20	WS519	1.0	2.0	8/15/2018	PCB from Immunoassay (Aroclor 1254)	11	J
100-118	Saltmarsh	S-WS520-18FSP12-00-10	WS520	0.0	1.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	4.8	J
100-118	Saltmarsh	S-WS520-18FSP12-10-20	WS520	1.0	2.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	5.6	J
100-118	Saltmarsh	S-WS520-18FSP12-20-30	WS520	2.0	3.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	3.5	J
100-118	Saltmarsh	S-WS520-18FSP12-30-40	WS520	3.0	4.0	10/5/2018	PCB from Immunoassay (Aroclor 1254)	4.1	J
100-118	Mudflat	S-WS521-18FSP12-00-10	WS521	0.0	1.0	9/17/2018	PCB from Immunoassay (Aroclor 1254)	9.9	J
100-118	Mudflat	S-WS521-18FSP12-10-20	WS521	1.0	2.0	9/17/2018	PCB from Immunoassay (Aroclor 1254)	2.8	J
100-118	Mudflat	S-WS521-18FSP12-20-30	WS521	2.0	3.0	9/17/2018	PCB from Immunoassay (Aroclor 1254)	3.8	J

Notes:
Pre-excavation confirmatory congener samples are shaded green.
D - reported value is from a dilution; U - not detected; J - estimated value
Total 18 NOAA PCB congeners multiplied by a factor of 2.6.

Table 2-1b
Pre-Excavation PCB Characterization Sample Results for Parcel 110-117

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
100-117	Upland	S-15O-INT254-00-10	INT254	0.0	1.0	10/20/2015	PCB from Immunoassay (Aroclor 1254)	1.80	
100-117	Upland	S-15O-INT254-10-20	INT254	1.0	2.0	10/20/2015	PCB from Immunoassay (Aroclor 1254)	1.40	
100-117	Upland	S-15O-INT255-00-10	INT255	0.0	1.0	10/20/2015	PCB from Immunoassay (Aroclor 1254)	1.60	
100-117	Upland	S-15O-INT255-10-20	INT255	1.0	2.0	10/20/2015	PCB from Immunoassay (Aroclor 1254)	1.00	
100-117	Mudflat	S-15O-INT256-00-10	INT256	0.0	1.0	10/26/2015	Total 139 PCB cong (excl non-detects)	39.00	
100-117	Mudflat	S-15O-INT256-10-20	INT256	1.0	2.0	10/26/2015	Total 139 PCB cong (excl non-detects)	210.00	
100-117	Mudflat	S-15O-INT256-20-30	INT256	2.0	3.0	10/26/2015	PCB from Immunoassay (Aroclor 1254)	23.70	D
100-117	Mudflat	S-15O-INT256-30-40	INT256	3.0	4.0	10/26/2015	PCB from Immunoassay (Aroclor 1254)	10.60	D
100-117	Mudflat	S-15O-INT256-40-46	INT256	4.0	4.6	10/26/2015	PCB from Immunoassay (Aroclor 1254)	2.00	
100-117	Upland	S-15O-INT257-00-10	INT257	0.0	1.0	10/20/2015	PCB from Immunoassay (Aroclor 1254)	2.10	
100-117	Upland	S-15O-INT257-10-20	INT257	1.0	2.0	10/20/2015	PCB from Immunoassay (Aroclor 1254)	2.00	
100-117	Mudflat	S-0101-1	S-101	0.0	1.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	44.20	
100-117	Mudflat	S-0101-2	S-101	1.0	2.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	119.60	
100-117	Mudflat	S-0101-3	S-101	2.0	3.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	3.12	
100-117	Mudflat	S-0108-1	S-108	0.0	1.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	5.72	
100-117	Mudflat	S-0108-2	S-108	1.0	2.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	145.60	
100-117	Mudflat	S-0108-3	S-108	2.0	3.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	0.16	
100-117	Upland	S-WS522-18FSP12-00-10	WS522	0.0	1.0	9/17/2018	Total 209 PCB cong (excl non-detects)	0.18	
100-117	Upland	S-WS522-18FSP12-10-20	WS522	1.0	2.0	9/17/2018	PCB from Immunoassay (Aroclor 1254)	1.7	J
100-117	Upland	S-WS524-18FSP12-00-10	WS524	0.0	1.0	9/20/2018	Total 209 PCB cong (excl non-detects)	0.31	
100-117	Upland	S-WS524-18FSP12-10-20	WS524	1.0	2.0	9/20/2018	PCB from Immunoassay (Aroclor 1254)	0.82	JB
100-117	Mudflat	S-WS525-18FSP12-00-10	WS525	0.0	1.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	0.86	JB
100-117	Mudflat	S-WS525-18FSP12-10-20	WS525	1.0	2.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	0.42	J
100-117	Mudflat	S-WS525-18FSP12-20-30	WS525	2.0	3.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	2.2	J
100-117	Upland	S-WS527-18FSP12-00-10	WS527	0.0	1.0	9/20/2018	Total 209 PCB cong (excl non-detects)	0.0278	
100-117	Upland	S-WS527-18FSP12-10-20	WS527	1.0	2.0	9/20/2018	PCB from Immunoassay (Aroclor 1254)	0.78	JB
100-117	Mudflat	S-WS528-18FSP12-00-10	WS528	0.0	1.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	3.9	J
100-117	Mudflat	S-WS528-18FSP12-10-20	WS528	1.0	2.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	1.6	J
100-117	Mudflat	S-WS528-18FSP12-20-30	WS528	2.0	3.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	29	JD
100-117	Saltmarsh	S-WS531-18FSP12-00-10	WS531	0.0	1.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	8.7	J
100-117	Saltmarsh	S-WS531-18FSP12-10-20	WS531	1.0	2.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	7.1	J
100-117	Saltmarsh	S-WS531-18FSP12-20-30	WS531	2.0	3.0	9/25/2018	PCB from Immunoassay (Aroclor 1254)	6.3	J

Notes:
Pre-excavation confirmatory congener samples are shaded green.
D - reported value is from a dilution; J - estimated value; B - contaminant detected in blank
Total 18 NOAA PCB congeners multiplied by a factor of 2.6.

Table 2-1c
Pre-Excavation PCB Characterization Sample Results for Parcel 100-120, ROW, and Parcel 100-85

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)
100-120	Upland	S-15G-INT261-00-10	INT261	0.0	1.0	8/5/2015	PCB from Immunoassay (Aroclor 1254)	0.70
100-120	Upland	S-15G-INT261-10-20	INT261	1.0	2.0	8/5/2015	PCB from Immunoassay (Aroclor 1254)	1.70
100-120	Mudflat	S-15G-INT262-00-10	INT262	0.0	1.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	11.70
100-120	Mudflat	S-15G-INT262-10-20	INT262	1.0	2.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	4.30
100-85	Mudflat	S-15L-INT258-00-10	INT258	0.0	1.0	7/16/2015	PCB from Immunoassay (Aroclor 1254)	7.50
100-85	Mudflat	S-15L-INT258-10-20	INT258	1.0	2.0	7/16/2015	PCB from Immunoassay (Aroclor 1254)	0.90
100-85	Mudflat	S-15G-INT259-00-10	INT259	0.0	1.0	8/28/2015	Total 139 PCB cong (excl non-detects)	9.7
100-85	Mudflat	S-15G-INT259-10-20	INT259	1.0	2.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	1
100-85	Mudflat	S-15L-INT260-00-10	INT260	0.0	1.0	7/16/2015	PCB from Immunoassay (Aroclor 1254)	9.10
100-85	Mudflat	S-15L-INT260-10-23	INT260	1.0	2.3	7/16/2015	PCB from Immunoassay (Aroclor 1254)	0.70
100-85	Mudflat	S-0113-1	S-113	0.0	1.0	9/27/1999	Total 18 NOAA PCB cong (excl non-detects)	338.00
100-85	Mudflat	S-0113-2	S-113	1.0	2.0	9/27/1999	Total 18 NOAA PCB cong (excl non-detects)	174.20
100-85	Mudflat	S-0113-3	S-113	2.0	3.0	9/27/1999	Total 18 NOAA PCB cong (excl non-detects)	3.12
100-85	Saltmarsh	S-0116-1	S-116	0.0	1.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	202.80
100-85	Saltmarsh	S-0116-2	S-116	1.0	2.0	9/23/1999	Total 18 NOAA PCB cong (excl non-detects)	7.80
100-85	Upland	S-3818-0.0-1.0	S-3818	0.0	1.0	10/19/2001	Total 18 NOAA PCB cong (excl non-detects)	0.04
100-85	Upland	S-0807-1	S-807	0.0	1.0	10/18/2000	Total 18 NOAA PCB cong (excl non-detects)	0.60
100-85	Upland	S-0807-2	S-807	1.0	2.0	10/18/2000	Total 18 NOAA PCB cong (excl non-detects)	0.19
100-85	Mudflat	S-WS532-18FSP12-00-10	WS532	0.0	1.0	9/18/2018	PCB from Immunoassay (Aroclor 1254)	9.7
100-85	Mudflat	S-WS532-18FSP12-10-15	WS532	1.0	1.5	9/18/2018	PCB from Immunoassay (Aroclor 1254)	6.4
100-85	Saltmarsh	S-WS533-18FSP12-00-10	WS533	0.0	1.0	9/20/2018	PCB from Immunoassay (Aroclor 1254)	65
100-85	Saltmarsh	S-WS534-18FSP12-00-10	WS534	0.0	1.0	9/20/2018	PCB from Immunoassay (Aroclor 1254)	43
100-85	Saltmarsh	S-WS534-18FSP12-10-20	WS534	1.0	2.0	9/20/2018	Total 209 PCB cong (excl non-detects)	24.3
100-85	Saltmarsh	S-WS534-18FSP12-20-30	WS534	2.0	3.0	9/20/2018	Total 209 PCB cong (excl non-detects)	59.1
100-85	Saltmarsh	S-WS534-18FSP12-30-40	WS534	3.0	4.0	9/20/2018	Total 209 PCB cong (excl non-detects)	81.9
100-85	Saltmarsh	S-WS534-18FSP12-40-49	WS534	4.0	4.9	9/20/2018	Total 209 PCB cong (excl non-detects)	52
100-85	Saltmarsh	S-WS534B-18FSP12-50-60	WS534B	5.0	6.0	3/13/2019	Total 209 PCB cong (excl non-detects)	4.85
100-85	Upland	S-WS535-18FSP12-00-10	WS535	0.0	1.0	8/28/2018	Total 209 PCB cong (excl non-detects)	0.477
100-85	Upland	S-WS535-18FSP12-10-20	WS535	1.0	2.0	8/28/2018	PCB from Immunoassay (Aroclor 1254)	23
100-85	Saltmarsh	S-WS537-18FSP12-00-10	WS537	0.0	1.0	10/4/2018	PCB from Immunoassay (Aroclor 1254)	0.64
100-85	Saltmarsh	S-WS537-18FSP12-10-20	WS537	1.0	2.0	10/4/2018	PCB from Immunoassay (Aroclor 1254)	3.3
100-85	Saltmarsh	S-WS537-18FSP12-20-30	WS537	2.0	3.0	10/4/2018	PCB from Immunoassay (Aroclor 1254)	5.4
100-85	Saltmarsh	S-WS539-18FSP12-10-20	WS539	1.0	2.0	3/13/2019	PCB from Immunoassay (Aroclor 1254)	15.1
100-85	Saltmarsh	S-WS539-18FSP12-20-30	WS539	2.0	3.0	3/13/2019	PCB from Immunoassay (Aroclor 1254)	35.7
ROW	Saltmarsh	S-3817-0.0-1.0REP	S-3817	0.0	1.0	11/2/2001	Total 18 NOAA PCB cong (excl non-detects)	14.56
ROW	Saltmarsh	S-3817-0.0-1.0	S-3817	0.0	1.0	11/2/2001	Total 18 NOAA PCB cong (excl non-detects)	28.60

Notes:
Pre-excavation confirmatory congener samples are shaded green.
D - reported value is from a dilution; U - not detected; J - estimated
Total 18 NOAA PCB congeners multiplied by a factor of 2.6.

Table 3-1
Compliance Survey Control Table for West Zone 5

Parcel	Station ID	Location	Easting	Northing	Design Elevation	Post-Excavation Elevation	Δ (ft)
			MA State Plane ft, NAD83		NAVD88 ft		
100-118	WS509	Sidewall	814986.2	2703612.9	-0.6	TBD	TBD
100-118	WS512	Sidewall	815001.2	2703516.8	-0.8	TBD	TBD
100-118	WS538	Sidewall	814978.4	2703831.7	0.7	TBD	TBD
100-118	WS539	Sidewall	814971.1	2703735.2	0.5	TBD	TBD
100-118	WS540	Sidewall	814974.4	2703655.9	0.6	TBD	TBD
100-118	WS541	Sidewall	815017.4	2703434.5	0.7	TBD	TBD
100-118	WS542	Sidewall	815039.4	2703368.9	-2.1	TBD	TBD
100-118	WS557	Sidewall	815008.5	2703836.3	-2.9	TBD	TBD
100-118	WS558	Sidewall	814981.8	2703750.1	-3.5	TBD	TBD
100-118	WS559	Sidewall	814986.3	2703663.7	-5.1	TBD	TBD
100-118	WS560	Sidewall	815018.1	2703482.6	-3.7	TBD	TBD
100-118	WS561	Sidewall	815035.4	2703389.9	-2.4	TBD	TBD
100-118	INT248	Floor	814981.0	2703647.0	-3.4	TBD	TBD
100-118	S-919	Floor	815028.0	2703399.0	-2.0	TBD	TBD
100-118	WS505	Floor	814978.6	2703715.1	-0.6	TBD	TBD
100-118	WS515	Floor	815014.5	2703468.9	-0.6	TBD	TBD
100-118	WS543	Floor	814985.5	2703808.2	-2.4	TBD	TBD
100-117	WS544	Sidewall	815102.1	2703217.4	-2.4	TBD	TBD
100-117	WS545	Sidewall	815097.7	2703172.0	-2.9	TBD	TBD
100-117	WS546	Sidewall	815104.1	2703138.4	-2.7	TBD	TBD
100-117	WS547	Sidewall	815108.7	2703065.9	-2.6	TBD	TBD
100-117	WS548	Sidewall	815122.2	2702982.0	-2.7	TBD	TBD
100-117	WS562	Sidewall	815099.0	2703187.9	-2.8	TBD	TBD
100-117	WS563	Sidewall	815105.9	2703119.5	-3.0	TBD	TBD
100-117	WS564	Sidewall	815117.9	2703022.9	-4.0	TBD	TBD
100-117	S-101	Floor	815100.0	2703200.0	-3.7	TBD	TBD
100-117	S-108	Floor	815115.0	2703000.0	-2.7	TBD	TBD
100-117	WS549	Floor	815105.9	2703100.2	-2.8	TBD	TBD
100-85	WS550	Sidewall	815136.4	2702629.7	-1.7	TBD	TBD
100-85	WS551	Sidewall	815102.0	2702571.0	0.6	TBD	TBD
100-85	WS552	Sidewall	815019.7	2702515.7	0.2	TBD	TBD
100-85	WS553	Sidewall	814934.8	2702469.8	-0.1	TBD	TBD
100-85	WS554	Sidewall	814847.6	2702464.8	-0.8	TBD	TBD
100-85	WS565	Sidewall	815121.3	2702562.1	-3.0	TBD	TBD
100-85	WS566	Sidewall	815052.0	2702525.3	-2.9	TBD	TBD
100-85	WS567	Sidewall	814978.1	2702470.8	-1.9	TBD	TBD
100-85	WS568	Sidewall	814886.1	2702449.6	-2.2	TBD	TBD
100-85	S-116	Floor	814900.0	2702465.0	-0.1	TBD	TBD
100-85	WS534B	Floor	815072.5	2702551.9	-3.9	TBD	TBD
100-85	WS539	Floor	815006.0	2702496.3	-1.0	TBD	TBD
100-85	WS555	Floor	815144.9	2702586.9	-2.9	TBD	TBD
100-85	WS556	Floor	814953.6	2702463.7	-2.0	TBD	TBD

Notes:
Elevation measurements at sidewall locations will be taken at the base of the sidewall (bottom of the excavation).
Locations WS557 through WS568 are compliance survey locations only (no associated PCB sample data).
MA - Massachusetts; NAD83 - North American Datum 1983; NAVD88 - North American Vertical Datum 1988; ft - feet; TBD - to be determined.
Δ - difference between post-excavation elevation and design elevation.

Table 7-1a
Proposed Restoration Acreages by Cover Type
for Parcel 100-118

Habitat Type	Existing Pre-Construction Area [acres]	Proposed Area of Restoration [acres]
Beach	0.003	0.003
Low Marsh	0.065	0.065
Mudflat/subtidal	0.037	0.037
TOTAL	**0.105**	**0.105**

Table 7-1b
Proposed Restoration Acreage by Cover Type
for Parcel 100-117

Habitat Type	Existing Pre-Construction Area [acres]	Proposed Area of Restoration [acres]
Mudflat/subtidal	0.018	0.018
TOTAL	**0.018**	**0.018**

Table 7-1c
Proposed Restoration Acreages by Cover Type
for Parcel 100-85

Habitat Type	Existing Pre-Construction Area [acres]	Proposed Area of Restoration [acres]
Beach	0.010	0.010
Mudflat/subtidal	0.018	0.018
Low Marsh	0.093	0.093
TOTAL	**0.121**	**0.121**

Table 7-2a
Parcel 100-118 Shrub Restoration Summary

Scientific Name	Common Name	On-Center Spacing Requirements (inches)	Number of Proposed Plants	Shrub Restoration Area
Iva frutescens	hightide bush	36"	125	Area 1
Total Proposed Trees/Shrubs for Parcel 100-118			**125**	

Table 7-2b
Parcel 100-85 Shrub Restoration Summary

Scientific Name	Common Name	On-Center Spacing Requirements (inches)	Number of Proposed Plants	Shrub Restoration Area
Iva frutescens	hightide bush	36"	93	Area 1
Total Proposed Trees/Shrubs for Parcel 100-85			**93**	

Appendix A

West Zone 5

Pre-Excavation Tree and Shrub Inventories

Appendix A
Parcel 100-118

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Memorandum

Subject	Parcel 100-118 Native Tree and Shrub Inventory	**Project Name**	New Bedford Harbor Superfund Site
Attention	Marie Esten USACE	**Project No.**	35BG2000
From	Jessica Rebholz/Kim Degutis	**Document Control No.**	ACE-J23-35BG6000-M17-0001
Date	21 March 2019		

Attachments: Figure 1 Existing Trees and Shrubs, Parcel 100-118, Tables 3-1 through 3-3 (inventory results)

1.0 Background

Jacobs conducted an inventory of existing trees and shrubs on Parcel 100-118 in the intertidal remediation area (Figure 1) on 31 May 2018. The purpose of the inventory was to identify existing trees and shrubs that would be removed in association with site remediation activities, including construction of the gravel access road and areas of excavation associated with contaminated sediment and soil removal. The information collected from this inventory is intended to be used to inform selection of proposed native woody species for future restoration plantings. Note that the temporary access road in the southern part of the parcel was not identified at the time of the survey, and therefore the upland area was not included in the survey. The survey area will be expanded as needed prior to construction.

2.0 Methods

For the purposes of the inventory, trees were defined as any nonclimbing, woody plant that had at least one erect perennial stem (trunk) with a diameter at breast height (DBH) of 3.0 inches or greater, regardless of height. Jacobs' wetland biologists walked the planned remediation portions of Parcel 100-118 and identified all trees within the proposed excavation and proposed access road areas. Tree locations were recorded using a Trimble Geo 7X GPS, capable of sub-meter accuracy.

For the purposes of the inventory, shrubs were defined as any nonclimbing, woody plant with a DBH less than 3.0 inches. Shrubs were inventoried according to dominant shrub types that appeared to constitute similar species diversity and percent areal cover. For purposes of documentation and reference, the results of the tree and shrub inventories are recorded by sub-area in separate tables included in Section 3 below.

3.0 Results

Of the 6 trees identified within Parcel 100-118, tree of heaven (*Ailanthus altissima*) is the dominant tree. Four trees (approximately 67%) of the trees identified within Parcel 100-118 are considered invasive and non-native. A list of the trees identified is provided in Table 3-1. For each species, the number of individual trees noted was calculated as an indication of the relative dominance of the species on-site.

High-tide bush (*Iva frutescens*) is the dominant shrub type for Areas 1 and 2 within Parcel 100-118. All of the shrubs identified are considered native and non-invasive (Tables 3-2 and 3-3).

Each area where shrubs were identified and inventoried is identified on Figure 1. Shrubs were classified by genus and species. Tables 3-2 and 3-3 also identify whether the shrub typically occurs in an upland area or within a wetland.

4.0 Conclusion

The species makeup of Parcel 100-118 is comprised of both native and invasive species, with high-tide bush (*Iva frutescens*) being the dominant shrub type and tree of heaven (*Ailanthus altissima*) being the dominant tree.

Legend

- Red cedar
- Tree of heaven
- MLLW
- MHHW
- Proposed Access Road
- Proposed Excavation Boundary
- Parcel Boundary
- Inventoried Shrub Areas

0 50 100 Feet

March 2019

Basemap Data Source:
Green Seal Environmental

Intertidal West Zone 5
Parcel 100-118
Pre-Excavation Tree and Shrub Inventory

New Bedford Harbor Superfund Site

JACOBS

Figure 1

Table 3-1
Existing Tree Inventory for Parcel 110-118

Scientific Name	Common Name	Tree Count (≥3" DBH)	Invasive[1]	Native/Non-Native[2]
Juniperus virginiana	eastern red cedar	2	no	native, county documented
Ailanthus altissima	tree of heaven	4	yes	non-native, county documented
	Total	**6**		

[1]According to "The Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts": https://www.mass.gov/files/documents/2016/08/tm/invasive-plantlist.pdf

[2]New England Wildflower Society. 2011. Go Botany, 12 April 2018 (https://gobotany.newenglandwild.org/). New England Wildflower Society, Framingham, MA

Table 3-2
Existing Shrub Cover for Parcel 100-118, Area 1

Scientific Name	Common Name	Area 1 Percent Areal Cover	Invasive[1]	Native/Non-Native[2]	Upland/Wetland
Iva frutescens	hightide bush	5%	no	native, county documented	wetland

[1]According to "The Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts": https://www.mass.gov/files/documents/2016/08/tm/invasive-plantlist.pdf

[2]New England Wildflower Society. 2011. Go Botany, 12 April 2018 (https://gobotany.newenglandwild.org/). New England Wildflower Society, Framingham, MA

Table 3-3
Existing Shrub Cover for Parcel 100-118, Area 2

Scientific Name	Common Name	Area 2 Percent Areal Cover	Invasive[1]	Native/Non-Native[2]	Upland/Wetland
Iva frutescens	hightide bush	10%	no	native, county documented	wetland

[1]According to "The Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts": https://www.mass.gov/files/documents/2016/08/tm/invasive-plantlist.pdf

[2]New England Wildflower Society. 2011. Go Botany, 12 April 2018 (https://gobotany.newenglandwild.org/). New England Wildflower Society, Framingham, MA

Appendix A
Parcels 100-85, 100-120 and ROW

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Memorandum

Subject	Parcel 100-85, 100-120, ROW Native Tree and Shrub Inventory	**Project Name**	New Bedford Harbor Superfund Site
Attention	Marie Esten USACE	**Project No.**	35BG2000
From	Jessica Rebholz/Kim Degutis	**Document Control No.**	ACE-J23-35BG6000-M1-0001
Date	21 March 2019		

Attachments: Figure 1 Existing Trees and Shrubs, Parcel 100-85, 100-120, ROW, Tables 3-1 and 3-2 (inventory results)

1.0 Background

Jacobs conducted an inventory of existing trees and shrubs on Parcels 100-85, 100-120, and the ROW in the intertidal remediation area (Figure 1) on 31 May 2018. The purpose of the inventory was to identify existing trees and shrubs that would be removed in association with site remediation activities, including construction of the gravel access road and areas of excavation associated with contaminated sediment and soil removal. The information collected from this inventory is intended to be used to inform selection of proposed native woody species for future restoration plantings. Note that the temporary access road was not identified at the time of the survey, and therefore the upland area was not included in the survey. The survey area will be expanded as needed prior to construction

2.0 Methods

For the purposes of the inventory, trees were defined as any nonclimbing, woody plant that had at least one erect perennial stem (trunk) with a diameter at breast height (DBH) of 3.0 inches or greater, regardless of height. Jacobs' wetland biologists walked the planned remediation portions of Parcels 100-85, 100-120, and the ROW and identified all trees within the proposed excavation area and proposed access road. Tree locations were recorded using a Trimble Geo 7X GPS, capable of sub-meter accuracy.

For the purposes of the inventory, shrubs were defined as any nonclimbing, woody plant with a DBH less than 3.0 inches. Shrubs were inventoried according to dominant shrub types that appeared to constitute similar species diversity and percent areal cover. For purposes of documentation and reference, the results of the tree and shrub inventories are recorded by sub-area in separate tables included in Section 3 below.

3.0 Results

Of the 3 trees identified within Parcels 100-85 and the ROW, Siberian crab apple (*Malus baccata*) is the dominant tree. Two of the three trees identified within Parcels 100-85 and the ROW are considered invasive and non-native. A list of the trees identified is provided in Table 3-1. For each species, the number of individual trees noted was calculated as an indication of the relative dominance of the species on-site.

High-tide bush (*Iva frutescens*) is the dominant shrub type for Area 1 and within Parcel 100-85. No shrubs were identified on the ROW or Parcel 100-120. High-tide bush is considered native and non-invasive (Table 3-2). Table 3-2 also identifies whether the shrub typically occurs in an upland area or within a wetland.

4.0 Conclusion

The species makeup of Parcels 100-85, 100-120, and the ROW is comprised mostly of native, non-invasive shrubs and non-native and invasive trees, with high-tide bush (*Iva frutescens*) being the dominant shrub type and Siberian crab apple (*Malus baccata*) being the dominant tree.

Legend

- Crab apple
- White oak
- MHHW
- MLLW
- Proposed Access Road
- Parcel Boundary
- Inventoried Shrub Areas
- Proposed Excavation Boundary

0 50 100 Feet

March 2019

Basemap Data Source:
Green Seal Environmental

Intertidal West Zone 5
Parcels 100-120, 100-85, ROW
Pre-Excavation Tree and Shrub Inventory

New Bedford Harbor Superfund Site

JACOBS

Figure 1

Table 3-1
Existing Tree Inventory for Parcel 100-85, 100-120, ROW

Scientific Name	Common Name	Tree Count (≥3" DBH)	Invasive[1]	Native/Non-Native[2]
Malus baccata	crab apple	2	yes	non-native, state documented
Quercus alba	eastern white oak	1	no	native, county documented
	Total	**3**		

[1]According to "The Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts": https://www.mass.gov/files/documents/2016/08/tm/invasive-plantlist.pdf

[2]New England Wildflower Society. 2011. Go Botany, 12 April 2018 (https://gobotany.newenglandwild.org/). New England Wildflower Society, Framingham, MA

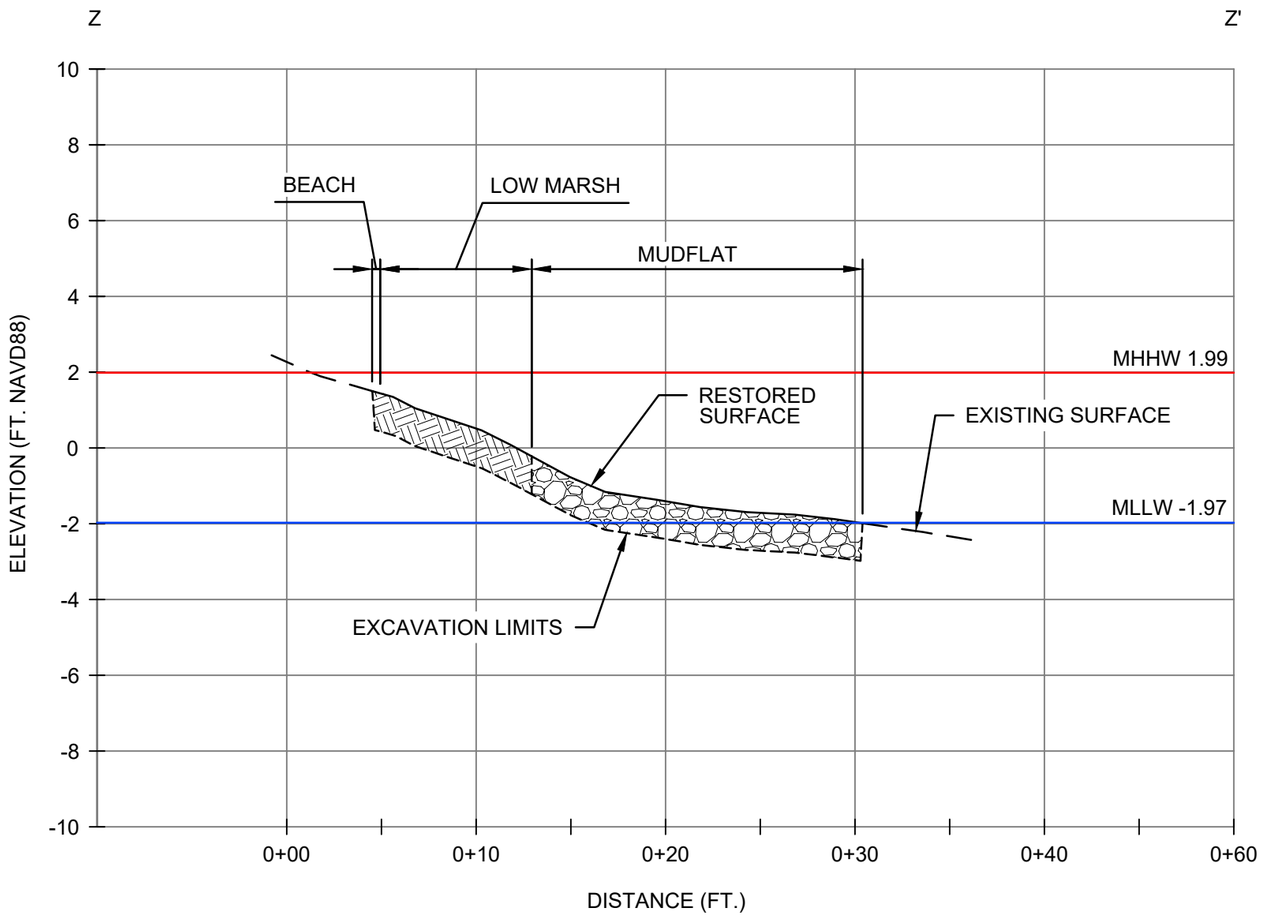
Table 3-2
Existing Shrub Cover for Parcel 100-85, Area 1

Scientific Name	Common Name	Area 1 Percent Areal Cover	Invasive[1]	Native/Non-Native[2]	Upland/Wetland
Iva frutescens	hightide bush	10%	no	native, county documented	wetland

[1]According to "The Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts": https://www.mass.gov/files/documents/2016/08/tm/invasive-plantlist.pdf

[2]New England Wildflower Society. 2011. Go Botany, 12 April 2018 (https://gobotany.newenglandwild.org/). New England Wildflower Society, Framingham, MA

Appendix B
Cross Sections



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL
- TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

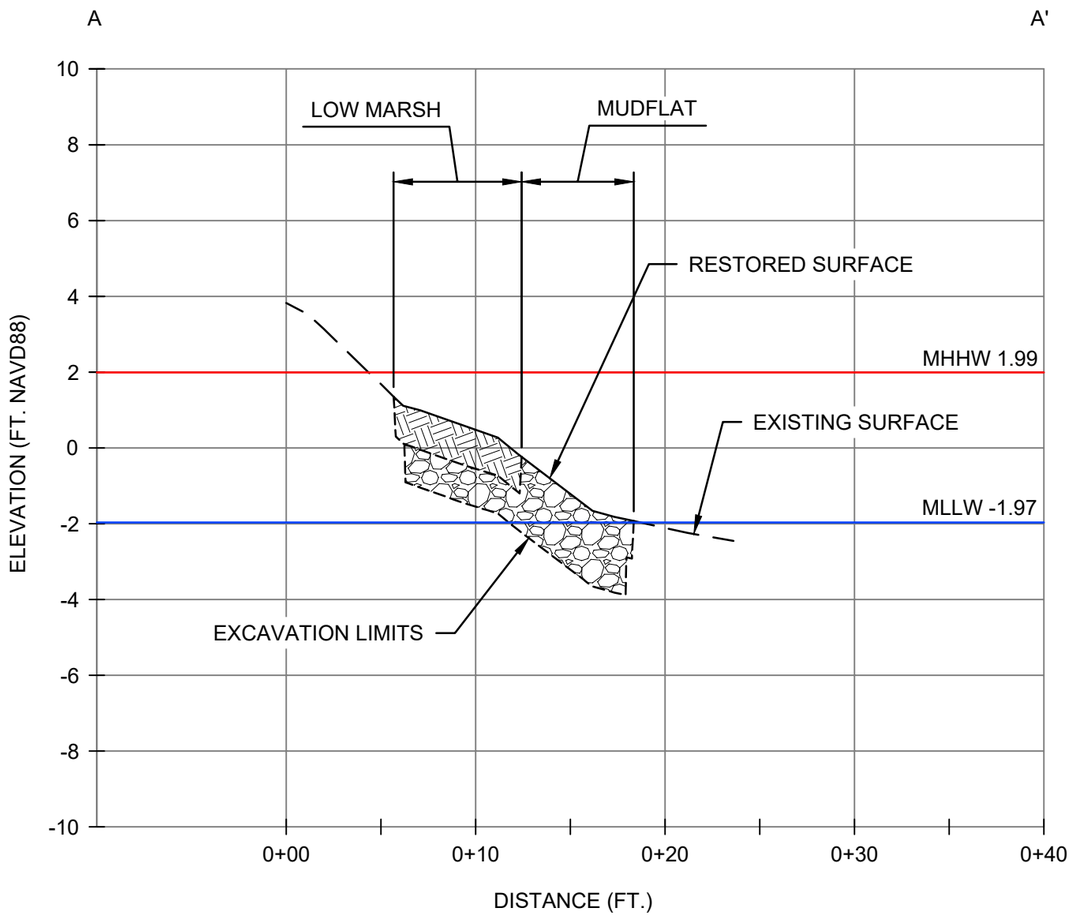
JACOBS®

WEST ZONE 5
SECTION Z-Z'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 1

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL
- TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

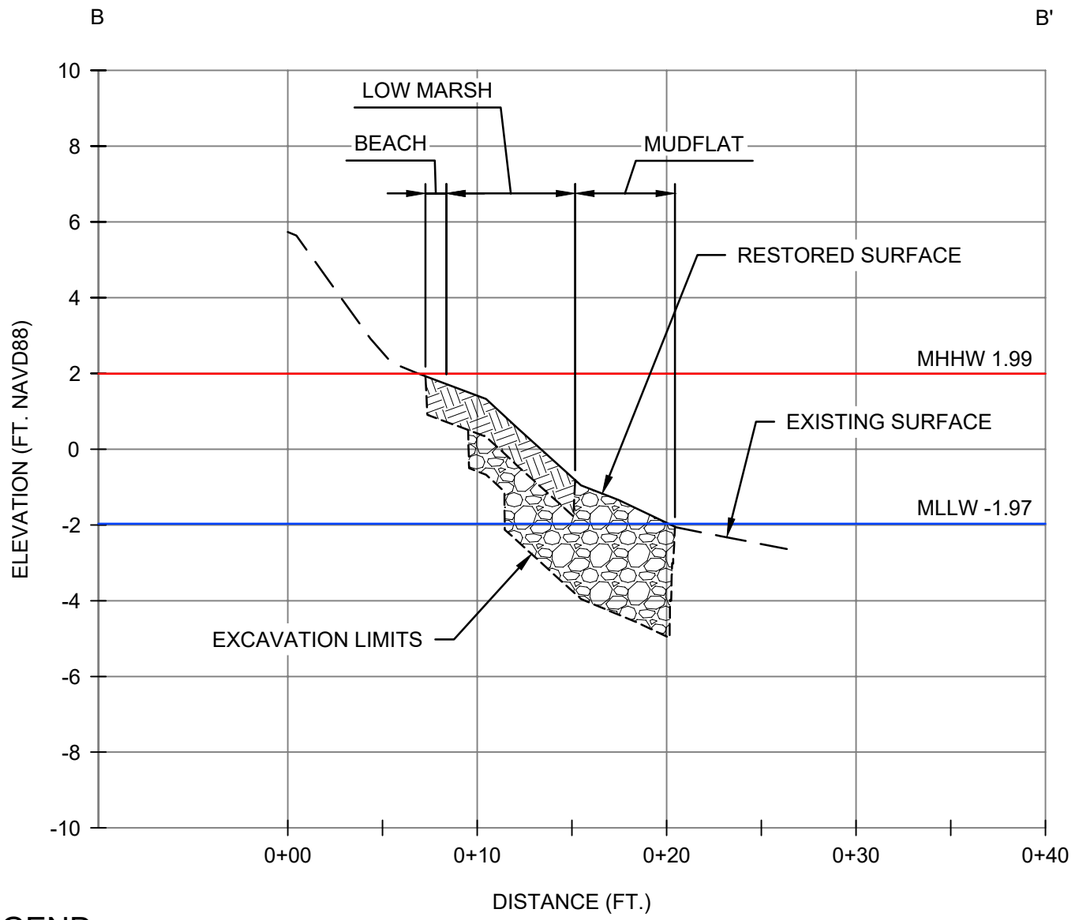
JACOBS®

WEST ZONE 5
SECTION A-A'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 2

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL
- TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

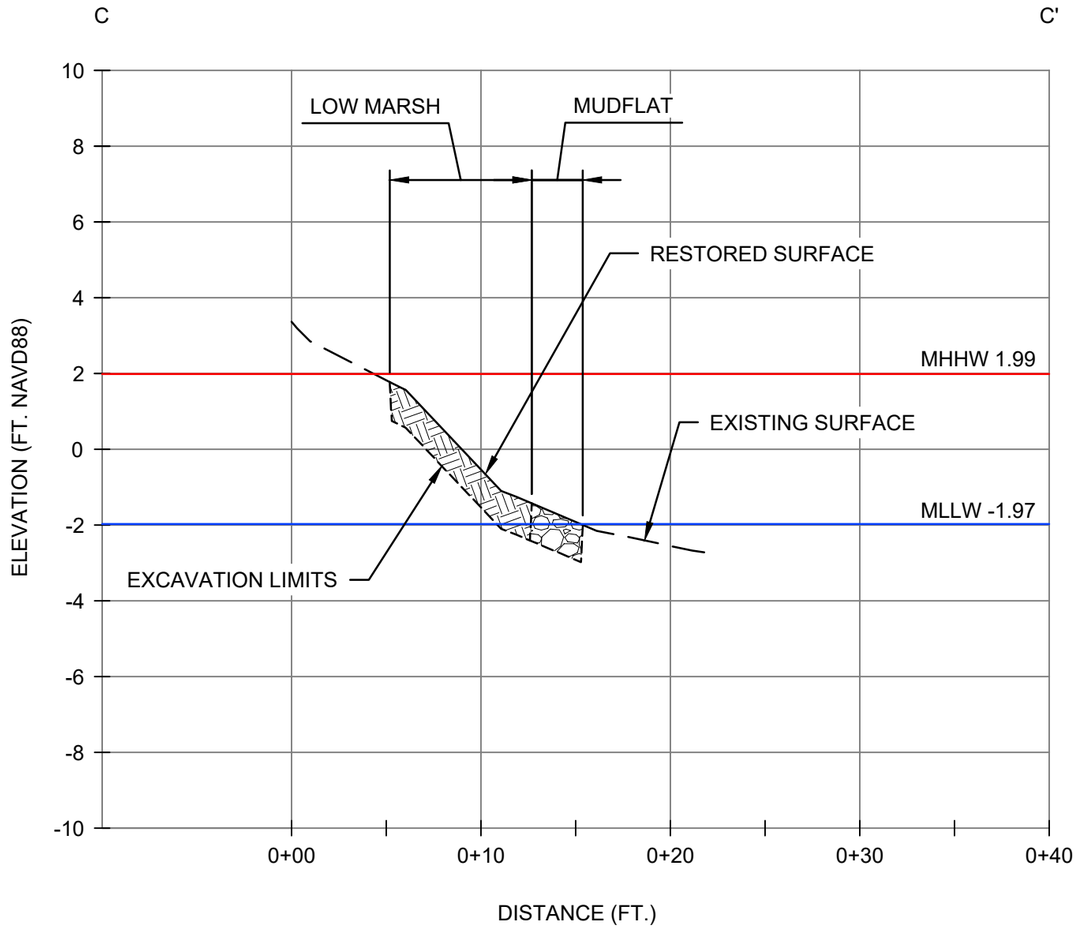
JACOBS®

WEST ZONE 5
SECTION B-B'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 3

BY:ENGLANLL
LAST SAVED:5/9/2019
CREATED:3/19/2019



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL
- TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

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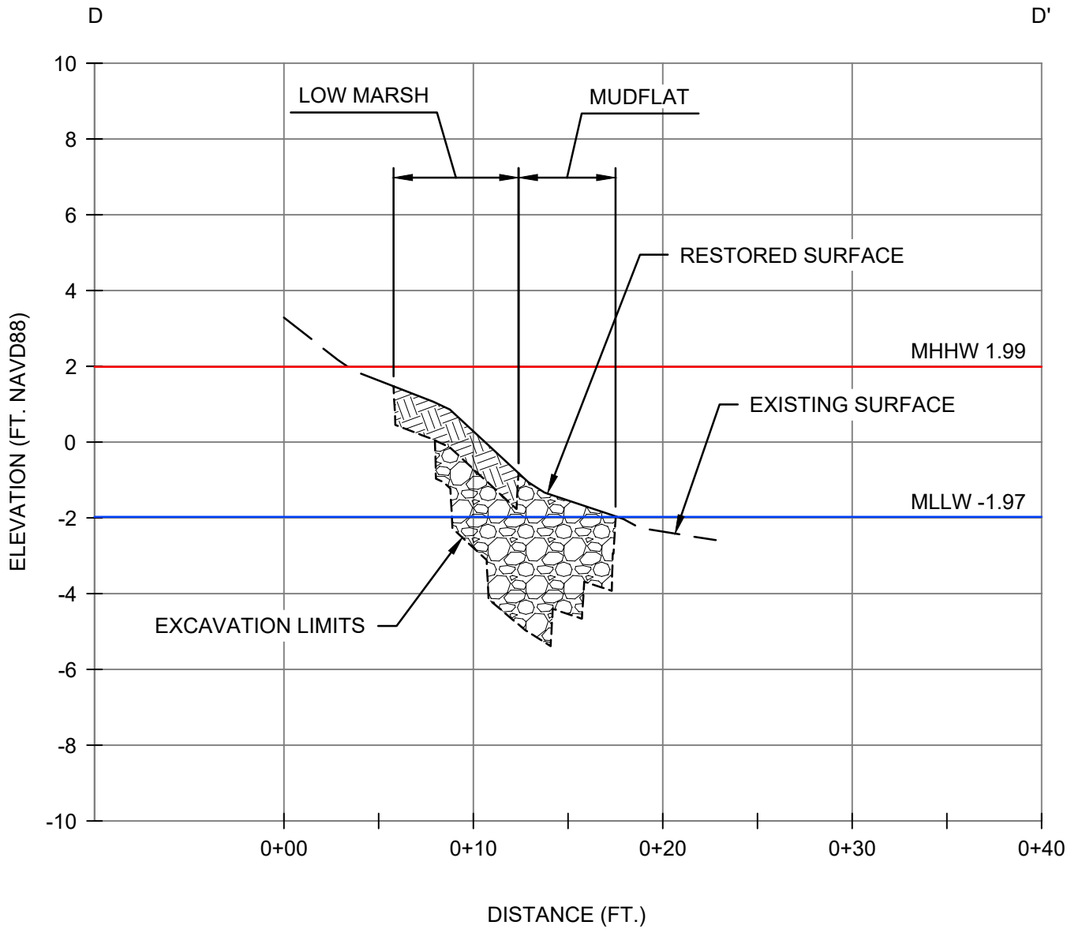
WEST ZONE 5
SECTION C-C'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 4

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL
- TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

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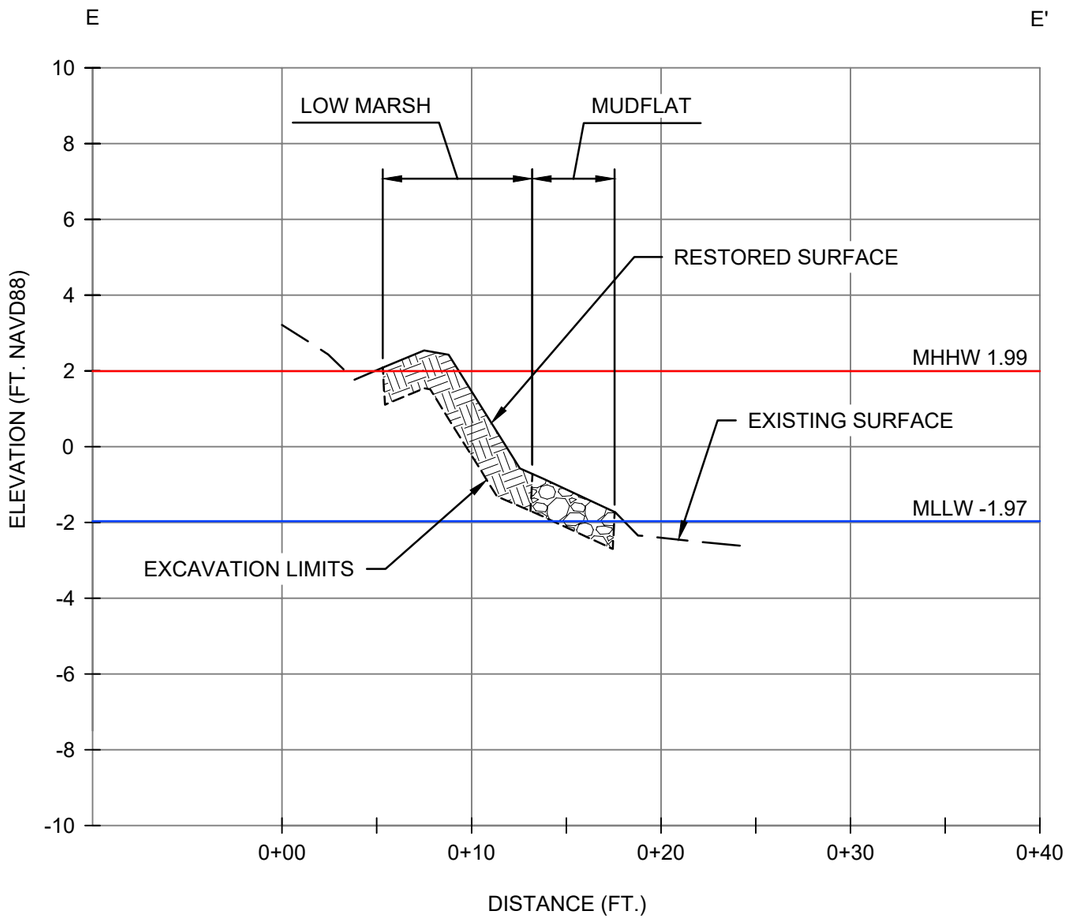
WEST ZONE 5
SECTION D-D'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 5

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL
- TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

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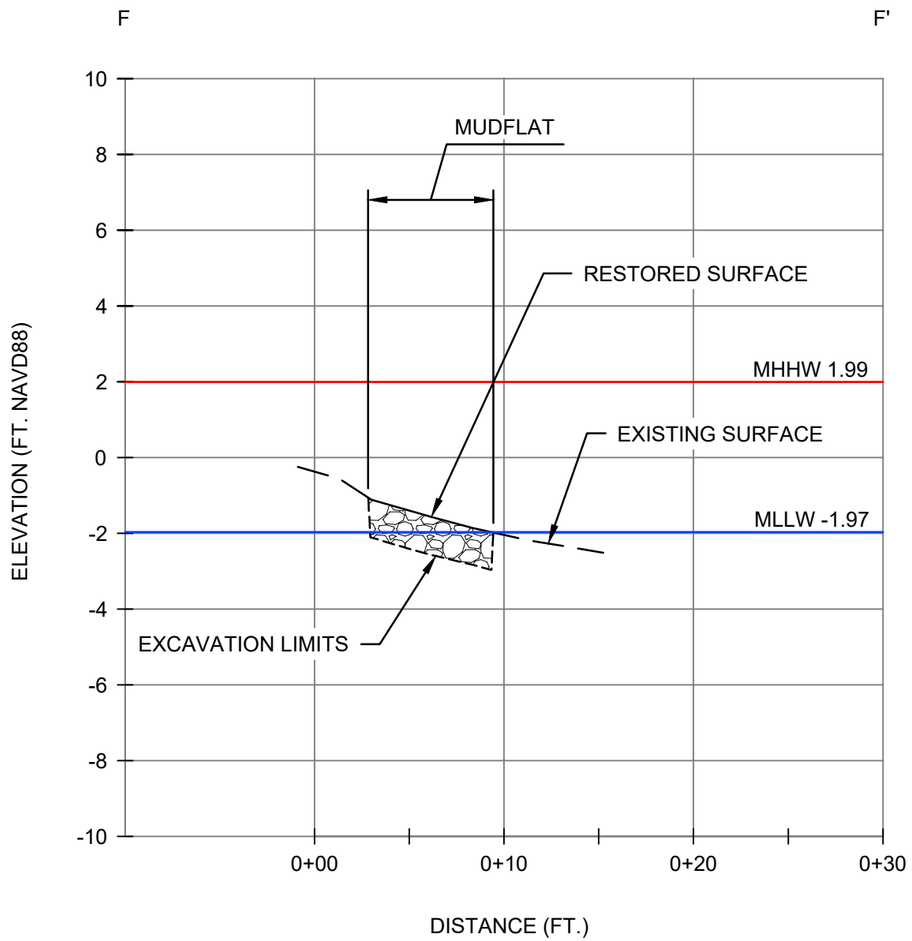
WEST ZONE 5
SECTION E-E'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 6

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL

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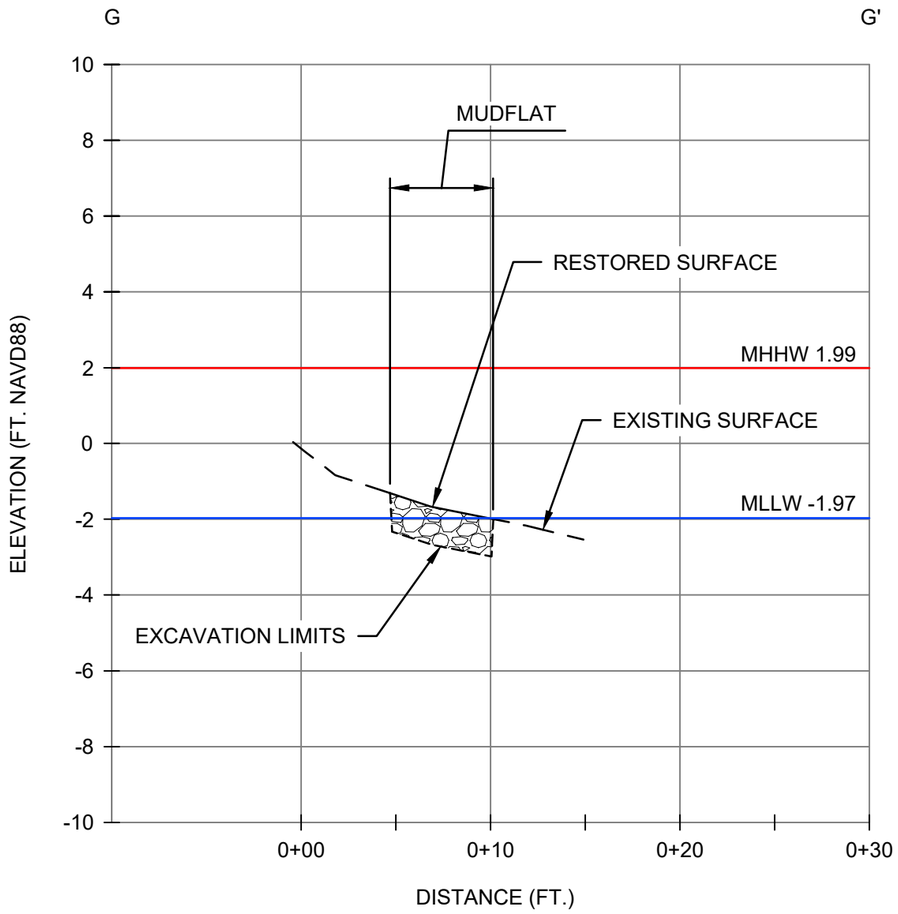
WEST ZONE 5
SECTION F-F'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 7



LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL

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WEST ZONE 5
SECTION G-G'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 8

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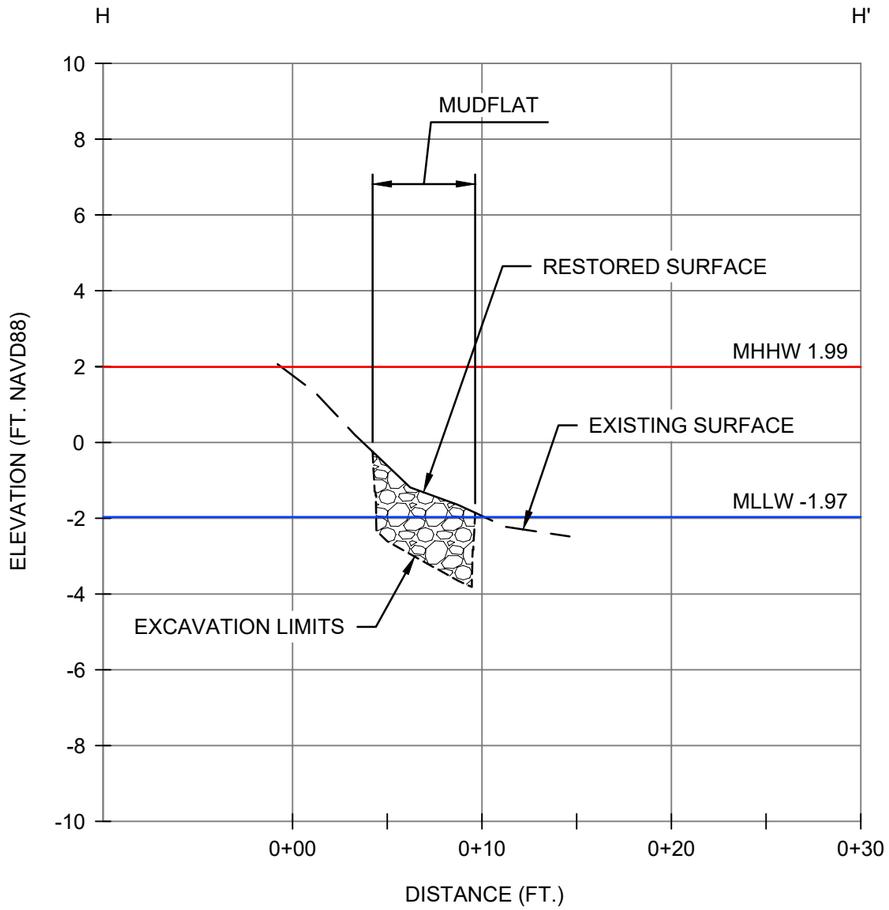

LEGEND:

- MHHW 1.99
- MLLW -1.97
- GRAVEL SUBGRADE BACKFILL

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL

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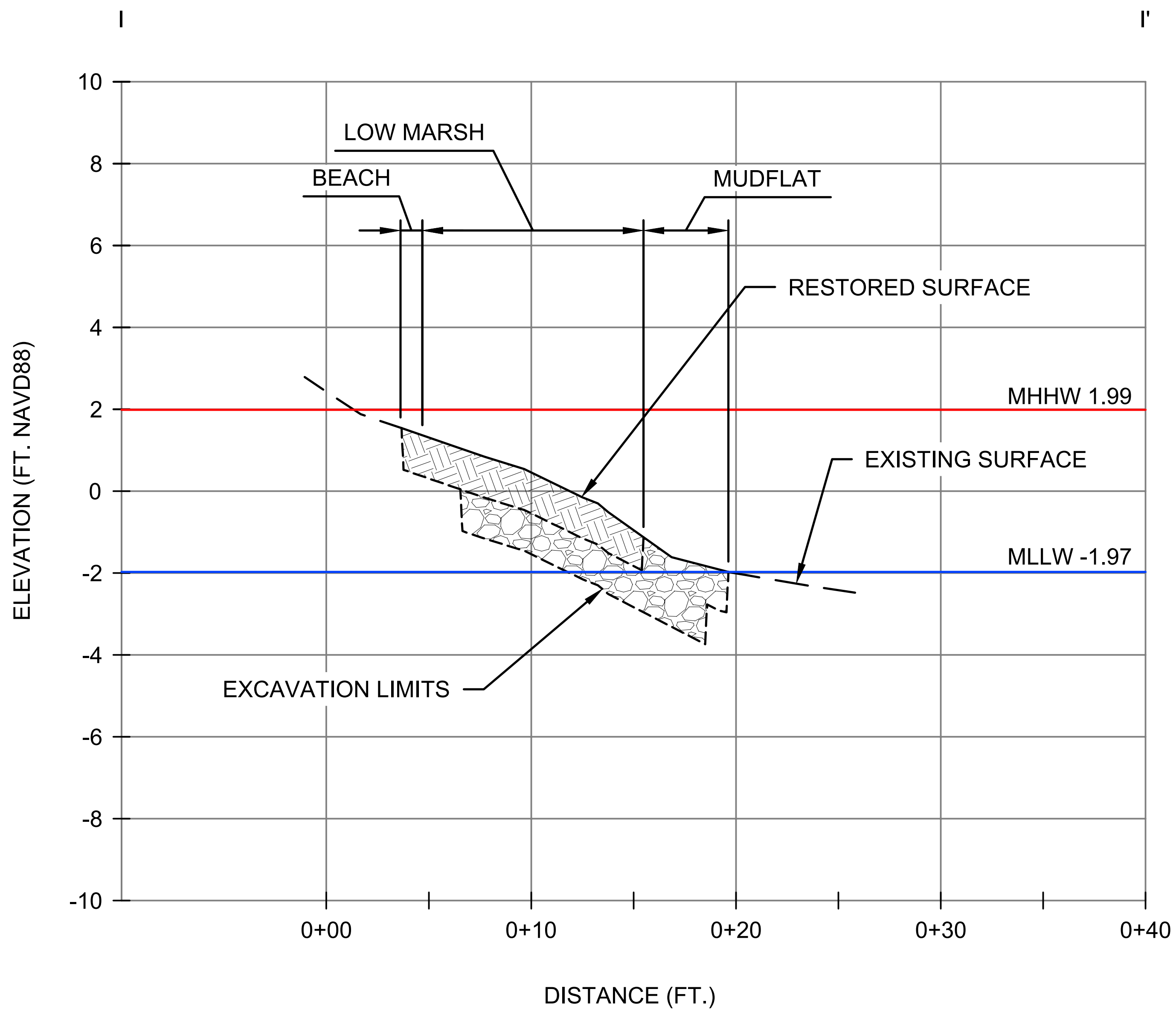
WEST ZONE 5
SECTION H-H'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 9



LEGEND:

MHHW 1.99

MLLW -1.97

GRAVEL SUBGRADE BACKFILL

TOPSOIL BACKFILL

NOTE:

1. MUDFLATS WILL BE BACKFILLED TO PRE-EXCAVATION ELEVATIONS TO APPROXIMATELY 10 FEET SEAWARD OF THE COIR LOGS INSTALLED AT THE LOW MARSH/MUDFLAT BOUNDARY, THEN SLOPED DOWNWARD TO MEET THE EXISTING HARBOR BOTTOM.

BY:ENGLANLL
LAST SAVED:5/9/2019
CREATED:3/19/2019

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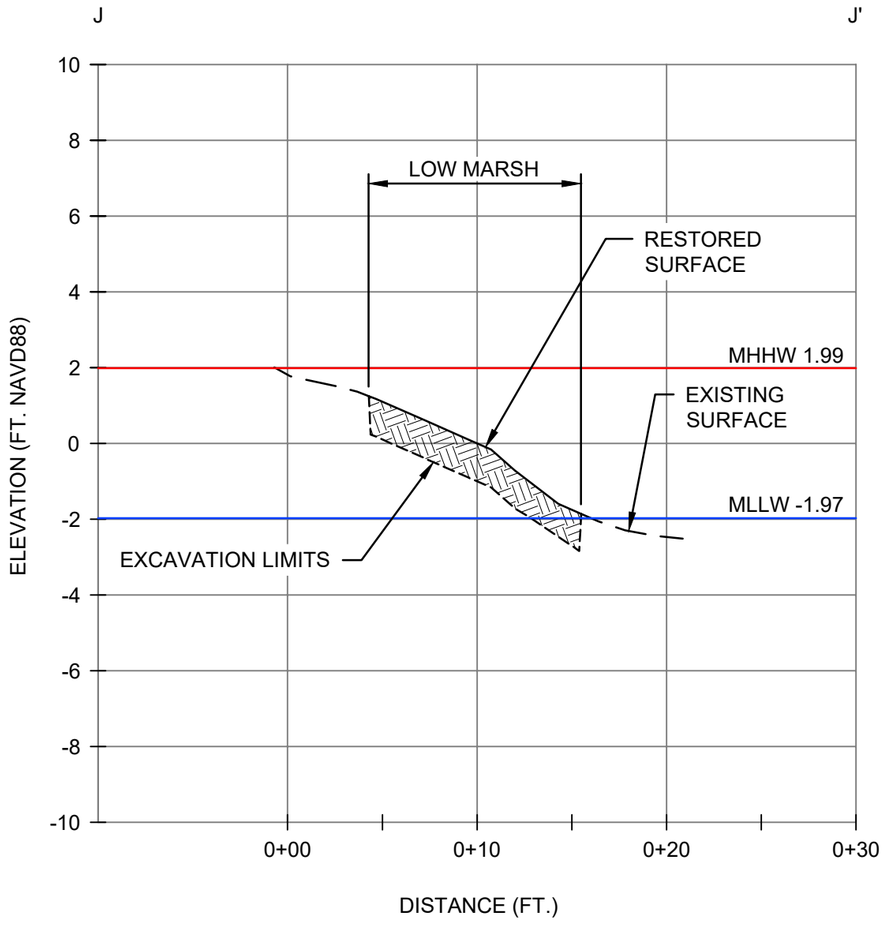
WEST ZONE 5
SECTION I-I'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 10



LEGEND:

- MHHW 1.99
- MLLW -1.97
- TOPSOIL BACKFILL

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL

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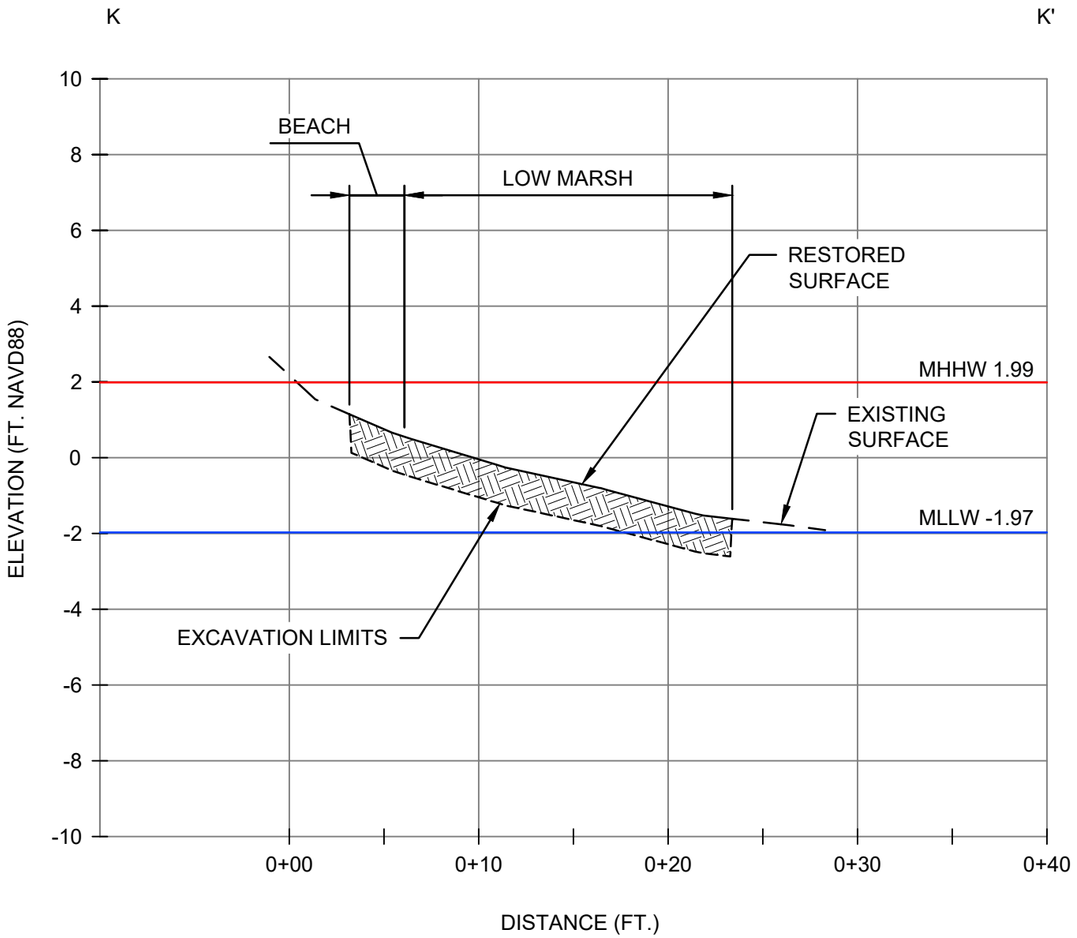
WEST ZONE 5
SECTION J-J'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 11



LEGEND:

- MHHW 1.99
- MLLW -1.97
- TOPSOIL BACKFILL

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WEST ZONE 5
SECTION K-K'

NEW BEDFORD HARBOR

MARCH 2019 | FIGURE 12

CREATED: 3/19/2019 LAST SAVED: 5/9/2019 BY: ENGLANLL

Legend

- Cross Section Locations
- Mean Lower Low Water
- Mean Higher High Water
- 1-foot Contour
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- Parcel Boundary
- Proposed Beach
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability

0 50 100 Feet

March 2019

Basemap Data Source:
Green Seal Environmental

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-118 Cross Section Locations

New Bedford Harbor Superfund Site

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Figure 13

Legend

- Cross Section Locations
- Mean Lower Low Water
- Mean Higher High Water
- 1-foot Contour
- Parcel Boundary
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- Minimal Backfill as Needed for Drainage or Slope Stability

0 50 100 Feet

March 2019

Basemap Data Source:
Green Seal Environmental

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-117 Cross Section Locations

New Bedford Harbor Superfund Site

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Figure 14

Legend

- Cross Section Locations
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- Parcel Boundary
- Proposed Beach
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability

0 50 100 Feet

March 2019

Basemap Data Source:
Green Seal Environmental

Vertical Datum:
NAVD88

Intertidal West Zone 5 Parcel 100-85
Cross Section Locations

New Bedford Harbor Superfund Site

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Figure 15

Appendix C

Schedule

(to be provided at a later date)