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New Bedford Harbor Superfund Site

Addendum to the Final Aerovox Interim Sediment Cap 100% Design Plan

U.S. Army Corps of Engineers New England District

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New Bedford Harbor Superfund Site

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Appendices

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Acronyms and Abbreviations

DNAPL	Dense Non-Aqueous Phase Liquids
EPA	Environmental Protection Agency
Final Design	Final Aerovox Interim Sediment Cap 100% Design Plan
h	horizontal
in	inch
Jacobs	Jacobs Field Services North America, Inc.
NAE	United States Army Corps of Engineers – New England District
NAVD88	North American Vertical Datum of 1988
PCB	polychlorinated biphenyls
v	vertical

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1. Introduction

Jacobs Field Services North America, Inc., (Jacobs) submitted the Final Aerovox Interim Sediment Cap 100% Design Plan (Final Design) for the United States Army Corps of Engineers – New England District (NAE) on June 15, 2018. The plan included an interim cap to contain polychlorinated biphenyls (PCBs) for a minimum of ten years. The design included subaqueous placement of smoothing layer sand, sand/organo-clay blended to create a confining layer, bioturbation sand layer and armor layer.

As a result of comments, changes in conditions and additional government requests, modifications to the 100% design have been made. Responses to the comments received on the Modification to the 100% Design memorandum are attached as Appendix A.

2. Background

The following sections describe the basis of the 100% design.

2.1 Final Design Capping System

The Final Design included two different capping designs, a shoreline design and a subtidal design, integrated to provide continuous isolation of PCB impacts. The integrated shoreline and subtidal design included the following:

- A smoothing/leveling layer of medium sand with a minimum thickness of 6 inches (in.);
- A minimum 6-in. isolation layer consisting of medium sand and organo-clay;
- A minimum 6-in. medium sand subtidal bioturbation layer;
- A minimum 6-in. 1 ½-in. stone subtidal erosion control layer; and
- A minimum 12-in. shoreline armor layer consisting of 8- to 10-in. rip rap, incorporated along the shoreline as necessary to prevent erosion.

2.1.1 Shoreline System

The existing shoreline contains a sheet pile wall and rip rap slope which varies from a vertical face to a 3 horizontal (h) to 1 vertical (v). A uniform surface is required in order to construct the cap. Therefore, a dual purpose smoothing/isolation layer will be installed over the existing rip rap to form a uniform surface with similar slope along the shoreline as well as provide chemical isolation of PCBs. This layer will consist of clean medium sand free from contaminants and contain 15 percent organo-clay by weight. This will provide reduction in the PCB flux from the existing shoreline to the surface water and will address the physicochemical process of molecular diffusion (in the absence of groundwater flow) that contribute to the migration and transfer of PCBs. The smoothing/isolation layer minimum thickness of 6-in. increases the transport length necessary for PCBs to reach the cap surface water interface by increasing the availability of sorptive materials that retard the transport process.

2.1.2 Subtidal System

The existing subtidal area contains previously dredged locations, as well as areas of potential DNAPL. The harbor bottom elevation adjacent to the former Aerovox facility varies from -4 ft. to -8 ft. North American Vertical Datum

of 1988 (NAVD88). While the slope between the elevations vary, the maximum observed slope is 5h:3v. To minimize slope variability in the cap area, a smoothing layer of clean medium sand will be placed over the existing sediment to an elevation of -6 ft. NAVD88. Once this material is placed, an additional 6 in. to 12 in. of clean medium sand will be placed over the entire interim cap area. Locations with elevations shallower than -6 ft. NAVD88 will have 12 in. of clean medium sand. This will provide a level transition to the isolation, bioturbation and armoring layers. It is assumed the bottom 6 in. of the smoothing layer sand will be intermixed with the existing sediment; therefore,an isolation layer will be placed over the smoothing layer. This will provide reduction in the PCB flux from the existing sediment to the surface water and will address the physicochemical process of molecular diffusion as well as advection/dispersion that contribute to the migration and transfer of PCBs to the surface water. A 6-in. minimum isolation layer will consist of clean medium sand with 15 percent organo-clay by weight. The isolation layer increases the transport length necessary for PCBs to reach the cap surface water interface by increasing the availability of sorptive materials that retard the transport process.

2.2 Cap Construction

2.2.1 Material Staging and Asphalt Protection

The Final Design included a 30 ft. corridor of asphalt protection along the sheet pile wall for terrestrial equipment access. At the direction of EPA, asphalt protection was also required to cover all asphalt areas construction equipment would be staged. The asphalt areas outside the 30 ft. corridor would be covered by composite mats. The 30 ft. corridor would include a minimum layer of 12 in. of dense grade gravel, filter fabric and composite mats.

2.2.2 Material Placement

The Final Design included mechanical placement of shoreline cap materials using an excavator or equivalent terrestrial equipment. Care will be taken to ensure the minimum layer thicknesses are achieved. Mechanical placement methodology will be used for a controlled, accurate placement of thin lifts, placed no more than 3 inches at one time. The mechanical equipment will be outfitted with a position and control system that accurately monitors the location and elevation to within 2-in. accuracy.

The subtidal cap would also employ mechanical placement technology including the use of 40 ft. by 200 ft. floating platform stabilized at each edge with hydraulic spud. Spuds will be placed in the excavated perimeter for stability. The floating platform will be located immediately south of the cap construction lane. The platform will be connected to the shoreline with ramps for access. The ramps at no time would rest on the sheet pile wall. The ramps would be hinged at the floating platform allowing for flexibility and raising of the ramps when the floating platform needed to be moved. The floating platform would move after each capping lane was completed by use of a cable winch system using the sheet piles placed around the cap perimeter. The cable winches avoid the use of work boats with potential propeller scour and resuspension in the cap area. If work boats are required to reset the cables, they will be operated at low propeller speed over the cap area. An excavator equipped with a material handling clamshell or level cut bucket will place the layer materials in thin lifts similar to the shoreline placement.

3. Construction Modifications

The following sections describe the changes to the 100% design.

3.1 Cap Construction

During recent discussions with government and select third parties, access to specific locations of the former Aerovox Property were requested. At the direction of EPA to accommodate third party access to monitoring wells located in the north east property corner, revisions to the Final Design construction methods were required. Jacobs modified the method of mechanically transporting the capping materials from terrestrial equipment to mechanical conveyor.

3.1.1 Material Staging and Asphalt Protection

The Final Design staging and asphalt protection was modified by terminating the asphalt protection system before the monitoring well cluster located in the northeast portion of the property. The mechanical conveyance system allows the cap materials to be transferred to the barge, allowing the asphalt protection system to be modified as shown on Figure 1 to provide third party access to wells.

In addition, the asphalt protection along the 30 ft corridor was augmented to include filter fabric over the AVX asphalt cap, which would prevent surficial damage to the engineered asphalt surface. The corridor protection is also clarified as a discrepancy was noted in the Final Design and the Final Design figure. The corridor protection system includes composite mats overlain by filter fabric and dense grade gravel. See Figure 2. This assembly allows for continuous composite mats over the former Aerovox property. Covering the composite mats with filter fabric prevents the interlocking system from binding with gravel. Completing the corridor system with dense grade gravel, allows for additional material to be placed as necessary to match the existing height of the exposed sheet pile wall.

The use of the conveyor also reduces the amount of dense grade previously planned in the Final Design. As indicated in the Final Design, dense grade would be placed on both sides as well as over the sheet pile wall to provide protection. The use of the conveyor reduces the amount of dense grade required, as terrestrial equipment will not be driven over the sheet pile wall.

The corridor protection system was also expanded from 30 ft to 36 ft allowing for the gravel to cover two composite mat widths, and allowing for the mechanical conveyor to be placed as needed without any restrictions.

3.1.2 Material Placement

The Final Design specified the terrestrial equipment carry capping materials from the staging area to the barge for placement. The use of a mechanical conveyance system allows for the capping materials to be transported by conveyor from the staging area to the barge without crossing the sheet pile wall. The conveyor will transfer the material by belt to a storage bin on the floating platform. The platform will be equipped with two storage bins. Each bin will be placed on rails with a winch system. One bin will be filled by the conveyor while the second bin is located near the equipment placing the cap materials.

3.1.3 Cap Lane Configuration

The Final Design specified cap construction would occur in a north to south direction. The revised plan, using a mechanical conveyor, will allow for the floating platform to complete the layers in a north to south direction; however, the floating platform will require adjustments from perpendicular to parallel throughout the cap construction.

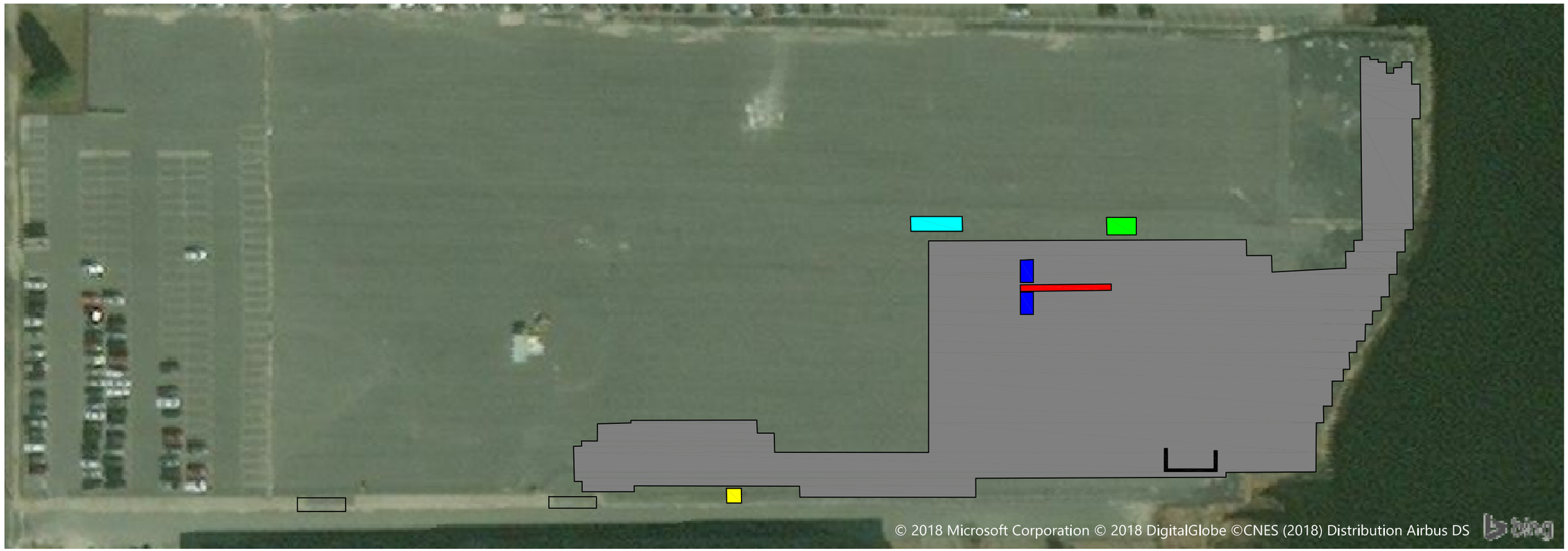
3.2 Additional Construction Clarifications

The Final Design specified material handling would be performed by an excavator equipped with a clamshell or level cut bucket. Both devices are anticipated to be used; however, changes to the planned equipment location have been made to improve operations.

Mixing equipment placement in the Final Design indicated the equipment would be placed on the southern portion of the Aerovox property. This location has moved to the center of the Aerovox property, as shown on Figure 1. This change improves the traffic flow pattern for incoming materials.

The Final Design indicated sorbent booms would be deployed if a sheen was observed. The plan has been modified to include the use of an 8-in. sorbent boom along the interior perimeter of the silt curtain. This provides continuous protection in the event of a sheen.

Figures



Mat Location

Conex Box

Break Trailer

Generator

Hopper

Telestacker

Rock Bin

Asphalt Protection System

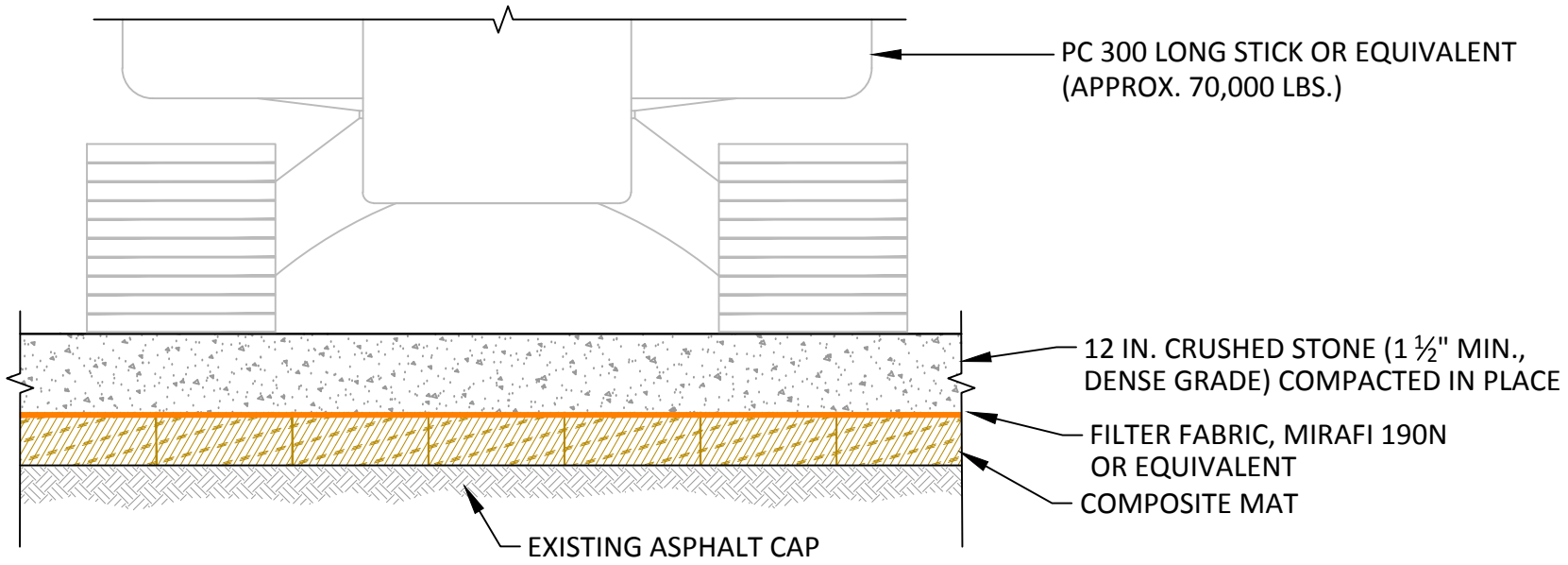
AEROVOX INTERIM SEDIMENT CAP

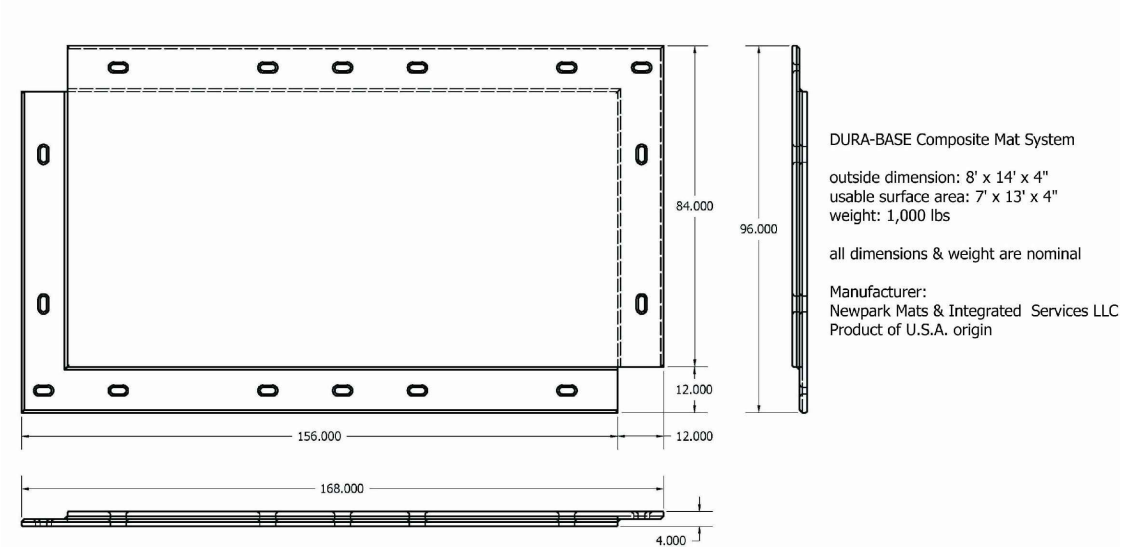
NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING
1

DATE:	9-05-18
DRAWN BY:	APM
CHECKED BY:	DEF
CAD FILE:	PAD PROGRESS 9-05-18
SCALE:	AS SHOWN





Not To Scale

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Aerovox
Asphalt Protection System Corridor
New Bedford Harbor Superfund Site

08/20/18 | Figure 2

Appendix A

Response to Comments

Dave Lederer's (EPA) Comments on Aerovox Cap 100% Design Revision

1) **Comment:** From my perspective, more detail is required with regard to the change to the tele-belt system

   Response: The Telebelt is a mechanical transport conveyor. The 100% design used a terrestrial transport system. The conveyor system will move the cap materials from the laydown area to the barge for placement, as opposed to a truck carry materials from the laydown area to the barge.

Laurie O'Connor (EPA) Comments on Aerovox Cap 100% Design Revision

1) **Comment:** Will this method be used north of the Aerovox site (i.e., on the Precix property) or will the ramps included in the original design be used there? If the Telebelt will be used for the Precix property as well, are there any logistical issues with getting the Telebelt vehicle there?

   Response: The mechanical conveyor will allow for materials to be transferred from the former Aerovox property to the floating platform. The mechanical conveyor when fully extended is 100 ft long. Equipment should not be required on the Precix property; however, a small excavator or backhoe may be needed for final grading and armor stone purposes.

2) **Comment:** Please confirm that "Maybe Mat" is the name of the mat manufacturer for the roadway. How are these mats different than the MegaDeck mats currently being installed at Aerovox? All of the mats will be MegaDeck.

   Response: MegaDeck mats is a trade mark name. Mabey Mats are also commonly referred to as MegaDeck mats. They both have similar structural capability. Both can support 600 psi loading conditions.

3) **Comment:** As Dave Dickerson already mentioned, the memo states that "A portion of the sheet pile wall will still require the protective mats, filter fabric and dense grade to support the Telebelt system, as shown in the attached figure", but that is not shown on the figure (and needs to be). Is the Telebelt vehicle expected to be stationary, or moved periodically (and if so, how often)?

   Response: The Telebelt system will need to be moved every 2-3 days to accommodate loading the roll off boxes staged on the deck barge as the barge progresses from the north to the south.

4) **Comment:** It appears, based on the figure, that mats will be placed along most of the sheet pile wall. Will the mats directly abut the sheet pile wall for the roadway? A more detailed/closer view figure is needed.

   Response: The mats will not directly abut the sheet pile wall in all locations. The mats will be as close as we can physically place them based on geometry of the wall. See Figure 1 of the Addendum to the Final Design Plan demonstrating the mat locations as installed.

5) **Comment:** How does the weight of the Telebelt vehicle when loaded compare to that of a dump truck? Do we expect this to weigh more? Is the weight consistent with the weight limits of the mats? Are additional materials needed under the Telebelt vehicle stabilizing arms? How far away from the sheet pile wall will the vehicle and stabilizing arms be? Care must be taken not to park/place the Telebelt vehicle wheels or stabilizing arms on top of potentially structurally unsound areas (i.e., the south trench).

Response: The Putzmeister Telebelt TB 130 arrives on site weighing 76,318 lbs. Travel weight over the road is supported by twelve (12) wheels and tires each carrying 6,400 lbs to the pavement with an approximate foot print of one (1) square foot or 6,400 PSF. When operating the Telebelt 130 is supported by four (4) outriggers supporting the equipment. The estimated payload traveling on the belt is 20,000 lbs so the total operating load of the equipment will be approximately 96,000 lbs to be supported by four (4) outriggers placed on 4' x 12' x 12" timber mats. Each timber mat supports approximately 45,000 lbs per square foot. The rear outriggers are supporting 75% of the operating rate. The calculated ground pressure for the rear mat supported outriggers is less than 1,000 lbs per square foot and less than the travel wheel load of the unit. The Telebelt TB 130 will also be located upon the asphalt protection corridor located adjacent to the steel sheet piling retaining wall for added AVX cap protection. Each mat supports 86,400 lbs per square foot. It should be noted the previously proposed dump truck weighted 116,823 lbs when fully loaded. The Telebelt system when fully loaded is less weight than the dump truck.

6) **Comment:** Based on online videos, the Telebelt TB130 machinery seems sound very loud. Operating hours should be considered.

Response: Sevenson does not anticipate the noise from the Telebelt to be any louder than the dredge boosters pumps that are used along the shoreline.

7) **Comment:** Are there any logistical issues with getting the Telebelt vehicle into the site (e.g., through the gates, turning radius, etc)?

Response: The Telebelt is self-contained and should have no trouble entering the site.

Tony Silva's (USACE) Comments on Aerovox Cap 100% Design Revision

1) **Comment:** Has such a system been used to place a sand/organoclay mixture previously?

Response: Sevenson intends to place the sand/organo clay mixture with an excavator staged on a deck barge. This is how the materials are typically placed and how Sevenson has done it on previous projects (River Raisin, Flint River, and Gowanus Canal).

2) **Comment:** Is there any potential for conveyer vibration to separate the clay from the sand during transit? Is the conveyor covered (e.g., on windy days will sand and/or clay be blowing off the conveyor during transit to the roll-offs)?

Response: Sevenson intends to keep the materials damp to minimize dust (see photo below). The misting system was used recently on the Gowanus Canal Superfund Site. We do not foresee belt vibrations being and issue. Sevenson has used conveyors and hoppers for blending operations in the past without any trouble. Note that the misting application will only occur on the organo clay and sand blending or the material piles. The Telebelt conveyor belt will not be misted due to potential performance issues.

3) **Comment:** How and where will the excavator and roll-offs be placed on the barge (there will no longer be access via ramps at the Aerovox site)?

Response: The excavator will be walked on at the C dock and the roll offs will be loaded at the same spot. The spuds will be placed using a crane from the North dock.

4) **Comment:** Under the modified design is there no longer a need to extend composite mats across the sheet pile wall?

Response: The mats will stop before the wall. They will be placed west of the wall. They will not touch the wall or cover the wall.

5) **Comment:** Confirm plans for placement of filter fabric, crushed stone and composite mats along the shoreline area. Figure 21 (100% design) shows excavator for shoreline area placement of cap with treads directly in contact with composite mats, but recent Jacobs discussions indicate that crushed stone or gravel would be placed on top of composite mats. What is proposed under this modified approach?

Response: The modified approach will also use geotextile, mats, and crushed stone system to protect the Aerovox cap system. The layer sequence from bottom to top will be geotextile, mat, geotextile, crushed stone. See Figure 2 of the Addendum to the Final Design Plan.

6) **Comment:** In the original 100% design, capping materials would be placed in the shoreline area using an onshore excavator equipped with a boom. With the modified system, the conveyor equipment will be located in the area where the onshore excavator would be maneuvering. Will the width of the "Maybe mat" roadway need to be increased to provide enough room for both systems to operate?

Response: The shoreline materials will be placed from the shoreline using a traditional long reach excavator. The mat roadway will be modified from 30 ft wide to 36 ft wide to accommodate the Telebelt outrigger width and the final mat configuration.

7) **Comment:** It's not clear how capping will be performed in the area adjacent to the Precix site north of the Aerovox property. Will any type of matting or protection be required to allow shoreline capping? Will the conveyor system need to be placed on the Precix property to support barge mounted capping in the offshore areas?

Response: The floating platform will require adjustments from perpendicular to the shoreline to parallel to the shoreline. The capping materials will be placed in a north to south fashion as indicated in the 100% Design Plan. The cap materials at Precix will be placed from the barge. The armor material at Precix may require a small excavator to place the stone from the shore. Composite decking will be moved from the Aerovox site to Precix to accommodate this equipment if it is determined to be necessary.

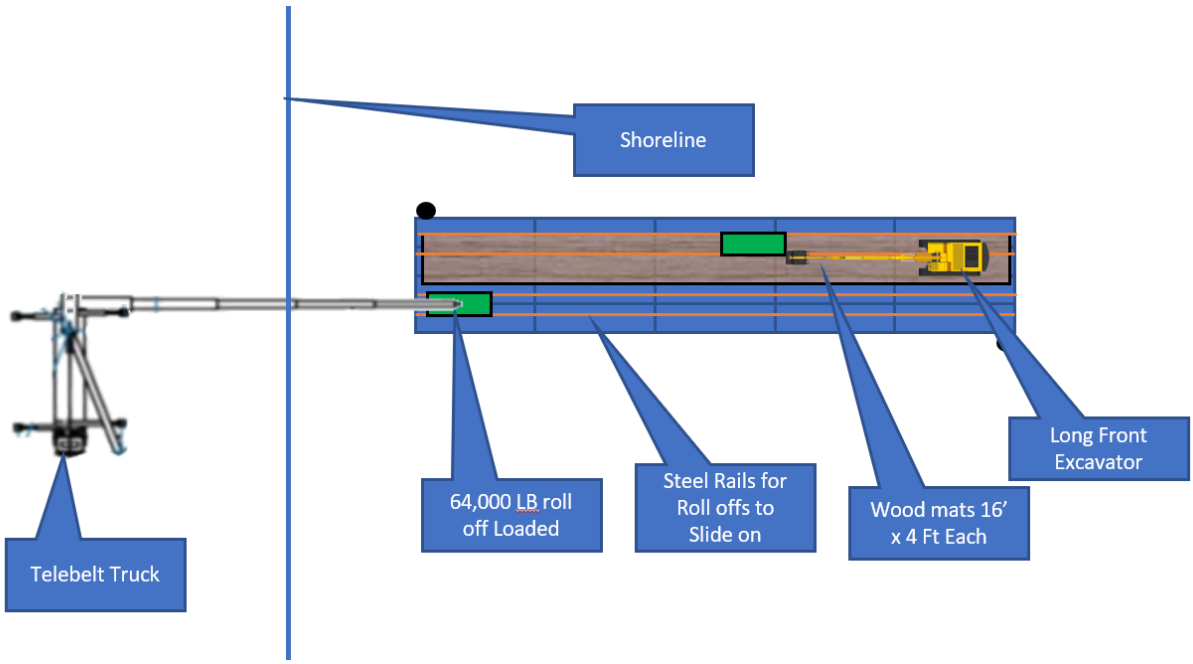
John Lally's (Lally Consulting) Comments on Aerovox Cap 100% Design Revision

1) **Comment:** Provide detail and photos of the roll-off boxes and cable-winch system.

Response: Currently being installed, photographs will be provided once construction has been completed.

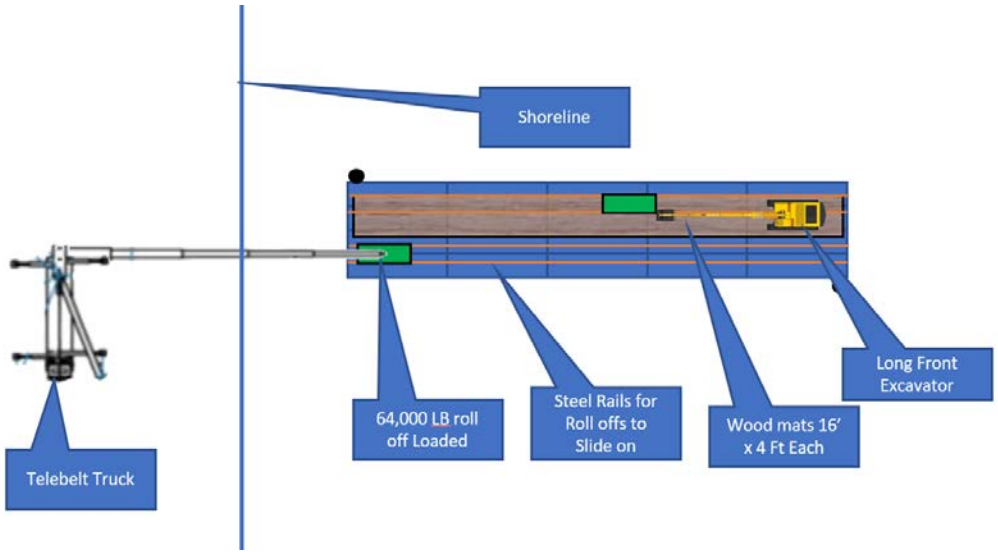
2) **Comment:** Will the barge require wear plates to address point loading at the boxes' (assumed steel) wheels? Provide specs and condition of modular barges to be employed.

Response: Roll offs will have four heavy casters welded to each corner of the boxes to move them. The wheels will roll in a C channel to keep them moving in the correct direction. The details of the wheels are below.



3) **Comment:** Are any tracking problems of the roll-off boxes anticipated across the travel path on the barges, that may necessitate rails of some sort?

Response: Steel C channel rails will be staged to avoid the tracks of the excavator (orange lines below). Details are below.



4) **Comment:** What are the dimensions of the roll-off boxes and how many bucket grabs of cap material are estimated per box load?

Response: The boxes will have an air space of 25 CY. The capping bucket is 2.25 CY so about 10 bucket bites per roll off.

5) **Comment:** Are any adjustments in the barge stability analysis or spud locations necessary by the modified on-barge cap material conveyance approach?

Response: Calculations for proposed configuration have been submitted to USACE.

6) **Comment:** Provide cap placement production estimate.

Response: A production estimate is under development.

7) **Comment:** Provide description of how with telebelt be loaded.

Response: The Telebelt will have a small feed hopper that will be fed with a small excavator (Komatsu PC220) or loader (Komatsu WA380).

8) **Comment:** Describe any new details on material blending equipment and procedure (i.e. sand & organoclay).

Response: Details have not changed. Same approach as specified in the work plan will be used.

9) **Comment:** What is the estimated spillage from telebelt along conveyance path?

Response: We have used this equipment of previous capping projects. We believe spillage will be negligible (less than 1%)

Appendix A

Response to Comments