MA ENDANGERED SPECIES ACT (G.L. c.131A)
CONSERVATION AND MANAGEMENT PERMIT

DATE		April 27, 2023
CONSERVATION PERMIT NO.:		023-417.DFW
NHESP FILE NO.		09-26941
PERMIT HOLDER		Noah S. Berger, Administrator Merrimack Valley Regional Transit Authority (MVRTA; now Merrimack Valley Transit (MeVA)) 85 Railroad Avenue Haverhill, MA 01835
PROJECT		MVRTA Riverbank Stabilization Project - Unpermitted Work in the Merrimack River

A. Permit Authority

Pursuant to the authority granted in the Massachusetts Endangered Species Act ("MESA") (G.L. c. 131A) and its implementing regulations (321 CMR 10.23), the Director of the Massachusetts Division of Fisheries & Wildlife (the "Division") hereby issues a Conservation and Management Permit (the "Permit") to Merrimack Valley Transit (MeVa, the "Permit Holder" or MVRTA). This Permit authorizes the Take of Shortnose Sturgeon and Atlantic Sturgeon as specified and limited herein. Both species are State-listed as "Endangered," pursuant to the MESA[1]. The Permit arises out of the construction of an unauthorized access road in support of the MVRTA Riverbank Stabilization project that was located on and in the Merrimack River substrate at 85 Railroad Avenue's bank along the Merrimack River, in the City of Haverhill, Massachusetts (Book 9938, Page 25, South Essex County Registry of Deeds; the "Property").

The ±0.9-acre portion of the Property (*Attachment 5*) is located along the southern bank of the Merrimack River at the MeVa operating facility, which is used for bus maintenance, bus parking, and MeVa administration. According to the Haverhill Assessor's Office, the Property occupies portions of Parcel Number 712-684-8, which also encompasses Parcels 4, 5, 6, and 7. The Property is located approximately 1,500 feet upstream (west) of the Comeau Bridge, and at approximately river kilometer 32 (river mile 19.5). The Merrimack River is tidally influenced in this section, but fully freshwater. The Work area or Site is located on the southern bank of the Merrimack River along a 430-foot section of bank erosion.

[1] The Atlantic and Shortnose Sturgeon are also federally listed and protected pursuant to the U.S. Endangered Species Act (ESA, 50 CFR 17.11) implemented by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS).

B. Description of Take

Prior Division Approved Project:

On September 29, 2021 pursuant to 321 CMR 10.18(2)(a), the Division issued a Determination (*Attachment 6*) approving a project to stabilize a 430-foot-long segment of the Merrimack Riverbank using measures comprised of sheet pile, riprap, granite block, structural fill, and vegetation (hereinafter, the "2022 Project") subject to conditions. The 2022 Project required the installation of a turbidity curtain within which all work must occur. This approved project included a temporary upland construction access path between the laydown area and the construction area located on the east side of the bus facility. All construction access and staging associated with the project was proposed *above* Mean High Water with no equipment, barges, or construction vehicles entering the Merrimack River below Mean High Water. Additionally, all construction equipment would remain above Mean Annual High Water. Riprap undulations were proposed and approved to provide a velocity break/surface complexity with permanent impacts to 2,200 square feet of River substrate, but no other work or use was approved within the turbidity curtain. Construction on the initial bank stabilization project was initiated in 2022 and continued until January 2023.

Unpermitted Changes to 2022 Division Approved Project:

The subject of this Permit is the unauthorized installation and use of the construction access road, in and on the substrate of the Merrimack River, and its removal from the Merrimack River (the Project).

Without consultation with the Division, as required by the Division's September 29, 2021 Determination, the Proponent installed a construction access riverward of the sheet pile stabilization, which moved construction access from *above* the Mean High Water (2022 Project) to *below* Mean High Water, and introduced riprap, bank fill material, and construction vehicles on and within Merrimack River Sturgeon habitat. The unauthorized construction access road installed in Fall 2022 is approximately 495 feet in length and up to 12 feet wide. It is comprised of a layer of 12-to-18-inch diameter riprap and topped with a ~1 to 2-inch layer of material excavated from the riverbank.

The unpermitted changes to the 2022 Project and 2022 Plans resulted in 5,760 square feet of impact to the river bottom relative to the 2022 Project (*Attachment 2*, "CURRENT CONSTRUCTION ROAD LIMITS (AREA OUTSIDE OF PROPOSED DESIGN)"; cross-section is shown in *Attachment 3)*.

- 2,200 square feet of the river substrate impacted is co-located with permanent riprap shown in the 2022 Plans. Notwithstanding this co-location of materials, the topping of the future undulations with riprap and bank excavation for use as a construction access road was not permitted in the Division's review and authorization of the 2022 Project. The undulations are shown in *Attachment 1* (Sheet 4 of 10 Restoration Plan, labelled "Proposed Riprap Undulations").
- 3,560 square feet (sf) of impact to river substrate occurred in areas that were not impacted in the 2022 Plan, other than some impact from the movement of the turbidity curtain, but received riprap and bank fill for the construction access road. Impacts to substrate included in the 2023 Project: Sand/Gravel/Cobble/Boulder substrate (±391 sf), Gravel substrate (±137 sf), and sand substrate (±3,032 sf). The unauthorized use and construction occurred in the area depicted by the single-cross hatch in *Attachment 2* that are not within the "Proposed Riprap Undulations" in *Attachment 1*.

C. Permit Performance Standards

Under the authority granted by and in accordance with MGL c131A§3 and 321 CMR 10.23, the Director may permit the Take of a State-listed species for conservation and management purposes provided that there is a long-term Net Benefit to the conservation of the impacted species. If the Director determines that the applicant for a permit has avoided, minimized and mitigated impacts to the State-listed Species consistent with the following performance standards, then the Director may issue a conservation and management permit, provided:

(a) the applicant has adequately assessed alternatives to both temporary and permanent impacts to State-listed Species;
(b) an insignificant portion of the local population would be impacted by the Project or Activity, and;
(c) the applicant agrees to carry out a conservation and management plan that provides a long-term Net Benefit to the conservation of the State-listed Species that has been approved by the Director, as provided in 321 CMR 10.23(5), and shall be carried out by the applicant.

The Director has determined that the applicant for this Permit has met the above noted performance standards and that the conservation and management plan described herein provides a long-term Net Benefit to the conservation of the Sturgeon.

D. Conservation and Management Plan

In order to provide a long-term Net Benefit to the Sturgeon, the Permit Holder has proposed, by way of the Permit Application, to provide funding in the amount of $68,221 to support three (3) years of study on Merrimack River Sturgeon young of year use of sand flats.

In order to avoid and minimize impacts to Sturgeon, the Permit Holder has proposed to:

(a) implement a range of Sturgeon protective measures including time of year restriction (no work April 1-July 15), install a turbidity curtain to exclude Sturgeon and reduce turbidity, work only when site is not inundated from river water, and ensure biologist oversight as in accordance with a Division-approved Sturgeon Protection Plan;

(b) implement restoration and monitoring of impacted habitats within the footprint of the unauthorized construction access road in accordance with a Division-approved Post Construction Restoration and Monitoring Plan; and

(c) implement a Corrective Plan of Action for restoration area(s) if monitoring demonstrates the river bottom is not properly restored to state-listed species habitat, as determined by the Division.

Therefore, the Project can be permitted pursuant to the MESA. This Permit is issued to condition the Project and to provide a long-term Net Benefit to Sturgeon. This Permit, explicitly, does not allow the Take of any individual Sturgeon. This Permit incorporates future monitoring activities to evaluate recovery of the impacted habitat and, if necessary, implement a future Corrective Action Plan; however, the Division reserves the right to require avoidance, minimization, mitigation, and long-term Net Benefit relative to impacts associated with the Corrective Plan.

E. Related Project Authorizations

Agency	Permit/Authorization 2022 Approved Project	Permit/Authorization 2023 Unpermitted Access Road
MA Environmental Policy Act (EEA 16542)	Certificate on EEF for roll-over EIR: Issued 5/16/2022	Notice of Project Change Certificate Issued 3/10/2023.
MA Wetlands Protection Act (WE 133-0329)	Order of Conditions – 12/2/2021	Enforcement Action Approval – Expected after issuance of this Permit
MADEP 401 Water Quality Certification	The Wetlands NOI's Order of Conditions served as the WQC (MassDEP File #33-1510 issued 12/2/2021).	BRP WW 26, Combined Permit for Section 401 Fill & Dredge Major Project, Transmittal number 22-WW26-0002-APP, issued 3/21/23
Chapter 91 License	License DEP File #22-WW01-120	Expected to be issued after this Permit

Army Corps of Engineers 404 Permit	Authorized under General Permit #7: Bank and Shoreline Stabilization (NAE-2019-2773) on 8/5/2022	NAE-2019-2773, issued 4/4/23
MA DMF Letter(s)	April 4, 2022 (EENF/EIR Comment)	DMF responded to the MEPA NPC that DMF had no additional comments
NOAA-NMFS ESA Review	Biological Assessment: June 2021	Email 01/13/2023 and confirm

F. Documents and Plans of Records

In accordance with the documents and plans of record submitted to the Division entitled:

- "Conservation and Management Permit Application" (dated February 2023; prepared by SWCA; the "Permit Application", included by reference herein).
- **2022 Plans**. RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY 85 RAILROAD AVENUE HAVERHILL, MASSACHUSETTS JULY 2021. Dated July 2021, last revised 1/2022. Sheets 1-10. Prepared by Geosyntec Consultants; *Attachment 1, the "2022 Plans"*.
- **Unpermitted Impacts, Plans.** RIPRAP CONSTRUCTION ROAD RIVER IMPACTS, dated December 2022, prepared by Geosyntec Consultants, sheet 1 of 1; *Attachment 2*.
- **Unpermitted Impacts, Photos and Cross-section**. Photos show the road at elevated tide, 3 sheets, prepared by Geosyntec Consultants; *Attachment 3*.
- **Biological Assessment for the federal Endangered Species Act, Section 7 Consultation.** "Biological Assessment for Shortnose and Atlantic Sturgeons at the Merrimack Regional Transit Authority (MVRTA) Riverbank Stabilization Project", dated June 2021, full Biological Assessment included by reference herein.
    - Appendix E -Shortnose and Atlantic Sturgeon Protection Plan (SPP) Merrimack Valley Regional Transit Authority (MVRTA) – Riverbank Stabilization Project Haverhill, Massachusetts June 2021 Prepared by Donald Pugh; *Attachment 4.*
- **Locus Map.** "Site Locus Map", prepared by Geosyntec Consultants, MA Environmental Policy Act, 2023 Notice of Project Change, Figure 1; *Attachment 5*.
- **September 29, 2021 Division Determination**. The text of the determination and conditions are included as an attachment to this Permit but excludes the text of the Biological Assessment attachment which is included by reference herein. A subsequent revision to the plans referred to in this determination was approved and the final plans of record are included herein as Attachment 1; *Attachment 6.*
- **MeVA Funding Letter**. "RE: MVRTA Riverbank Stabilization Project NHESP No. 09-26941" dated March 31, 2023, prepared by Noah Berger, MEVA Administrator. Included by reference herein, the "MEVA Funding Letter".

and any other plans and documents referenced herein (collectively, the "Plans of Record"), this Permit is issued with the following General and Special Conditions:

G. General Conditions

GC 1.		The Permit Holder shall comply with all General and Special Conditions of this Permit and complete the Project consistent with all Division-approved plans and supporting documents referenced herein, except as otherwise approved by the Division in writing.
GC 2.		A violation of any General or Special Condition of this Permit will result in an unauthorized Take and may be subject to civil and or criminal penalties pursuant to M.G.L. c. 131A. The Division reserves the right to require an immediate cessation of Work (as defined in Special Condition #1), in whole or in part

		and at its sole discretion, should the Permit Holder violate any General or Special Condition of this Permit.
GC 3.		The Permit Holder shall submit in writing any documents, plans, reports, or other items required for submission in accordance with this Permit, for review and written approval by the Division, except as otherwise approved by the Division in writing.
GC 4.		Division representatives shall have the right to enter and inspect the Property subject to this Permit at reasonable hours to evaluate Permit compliance and require the submittal of additional, reasonable information not otherwise required by this Permit but deemed necessary by the Division to complete its evaluation.
GC 5.		Any land protected to achieve a long-term Net Benefit associated with this Permit shall remain undeveloped and protected as habitat for State-listed Species in perpetuity.
GC 6.		This Permit shall not preclude the review of future projects on the Property that are subject to the Wetlands Protection Act Regulations (310 CMR 10.37, 10.58(4)(b), 10.59), as applicable, by the Division.
GC 7.		This Permit does not relieve the Permit Holder of the necessity of complying with all applicable federal, state or local statues, ordinances, bylaws or regulations, including but not limited to those administered by the City of Haverhill Conservation Commission, Massachusetts Department of Environmental Protection, the United States Army Corps of Engineers, Division of Marine Fisheries, and the National Marine Fisheries Service.
GC 8.		All Work shall be in conformance with the Plans of Record. Any changes, updates, or revisions to the Project, or any additional work beyond that shown on the Plans of Record or change in use, shall require additional review and approval by the Division prior to implementation, pursuant to General Condition 9. This Permit prohibits any work not specifically authorized by this Permit, unless otherwise approved by the Division in writing prior to performing the additional work.
GC 9.		Any proposed change to any plan identified in this Permit, or to the State-listed species conservation and management plan required by way of this Permit, shall require the Permit Holder to inquire of the Division, in writing, whether the change is significant enough to require the filing of a new Conservation and Management Permit Application, and or require additional long-term Net Benefit for affected State-listed Species. The Division retains the right to require the submittal of additional, reasonable information to evaluate the proposed plan change.
GC 10.		This Permit shall apply to, and inure to the benefit of, the Permit Holder and any successor-in-interest of the Permit Holder, or to a subsequent successor-in-control of the Property or portion thereof subject to this Permit should the Permit Holder convey its record ownership of the Property to said successor-in-control, as well as to any contractor or other person performing Work conditioned by this Permit. Within three (3) days of the transfer of an interest in the Property or a portion thereof, any successor-in-interest or subsequent successor-in-control [i.e., subsequent owners or operators] of the Property or a portion thereof shall provide the Division with a letter indicating (1) that the successor is the successor-in-interest of the Permit Holder or the successor-in-control [i.e., current owner or operator] of the Property or a portion thereof, and (2) that said successor will perform the obligations of the Permit Holder as set forth in this Permit.
GC 11.		**Prior to the initiation of Work**, the Permit Holder shall notify the Division in writing of the name, address, email, business and home telephone numbers of the project supervisor(s) and/or contractor(s)

		responsible for compliance with this Permit. The Permit Holder shall provide updated information in writing to the Division should new or additional project supervisors and/or contractors be hired after Work has commenced. **Prior to the initiation of Work**, said project supervisor(s) and/or contractor(s) shall be provided a copy of this Permit. Said project supervisor(s) and/or contractor(s) may be held responsible for violations of this Permit performed by said project supervisor(s) and/or contractor(s).
GC 12.		**Within 14 days of the initiation of work,** the text of this Permit shall be recorded by the Permit Holder in the Registry of Deeds or the Land Court for the district in which the Property is located so as to become a record part of the chain of title of the Property. In the case of recorded land, the Permit shall be noted in the Registry's Grantor Index under the name of the owner of the Property upon which the proposed Work is to be done. In the case of registered land, the Permit shall be noted on the Land Court Certificate of Title of the owner of the Property upon which the proposed Work is done. The Permit Holder shall submit to the Division a date-stamped and signed copy of said recorded Permit showing the date and book and page of recording within five (5) business days after recording and/or filing, as applicable. No Work shall be initiated on the Property until the Permit is recorded and said recorded copy is submitted to the Division, except as otherwise approved by the Division in writing.
GC 13.		**Prior to the initiation of Work**, the Permit Holder shall send a summary report to the Division which: (a) demonstrates compliance with all pre-Work General and Special Conditions of the Permit; and (b) requests permission to initiate the Work authorized by the Permit. Unless otherwise authorized by the Division in writing, **no Work may be initiated on the Property** until the Permit Holder has received written confirmation from the Division confirming compliance with all pre-Work General and Special Conditions and authorizing the initiation of Work. **Within three (3) days of the initiation of Work**, the Permit Holder shall send a letter to the Division confirming the date upon which Work commenced.
GC 14.		The Project authorized by this Permit shall be completed within five (5) years from the date of issuance. If needed, the Permit Holder shall submit a written request to the Division for an extension of time to complete said Project, and the Division will review the Project pursuant to MESA for any continuing impacts as described herein and for any new impacts to any State-listed species found subsequent to the issuance date of this Permit. Said request shall be submitted to the Division at least sixty (60) days prior to expiration of this Permit, and shall include a summary report demonstrating compliance with all General and Special Conditions of this Permit.
GC 15.		**Within (3) months of the completion of Work** the Permit Holder shall submit to the Division a written request for a Certificate of Permit Compliance (the "Certificate"), including as-built plans and other supporting materials demonstrating the completion of Work and compliance with all General and Special Conditions of the Permit. The text of the Division-issued Certificate shall be recorded by the Permit Holder in the Registry of Deeds or the Land Court for the district in which the Property is located so as to become a record part of the chain of title of the Property. Unless an extension is granted in writing by the Division pursuant to General Condition #14, the Permit Holder shall record the Division-issued Certificate **prior to expiration of the Permit**. The Permit Holder shall submit to the Division a date-stamped and signed copy of said recorded Certificate showing the date and book and page of recording **within five (5) business days after recording and or filing**, as applicable.
GC 16.		This Permit does not grant any property rights or any exclusive privileges; it does not authorize injury to private property or invasion of property rights.

GC 17.		All successors and assigns in interest or control of the project and properties which are not Commonwealth trust properties subject to this Permit and any contractor or other person performing work conditioned by this Permit shall adhere to all applicable procedural and technical Conditions of this Permit.
GC 18.		The contractor(s) employed to execute dredging, dredged material disposal, earth-moving, discharging of fill material, vegetation removal, demolition, and/or operation of vessels and onboard equipment on the properties subject to this Permit must be provided a copy of this Permit prior to the commencement of any Work. Said contractor(s) may be held responsible with the Permit Holder for violations of the Permit performed by the contractor(s).
GC 19.		This Permit specifically prohibits any activity or work or use not specifically authorized by this Permit, unless approved in writing by the Division prior to such additional work. All Work shall be in conformance with the Plans of Record as may be amended and approved by the Division. Any changes, updates, or revisions to the proposed Project or any additional work beyond that shown on the Plans of Record shall require additional review and approval by the Division prior to implementation, pursuant to General Condition #9. The Division maintains the right to require an immediate cessation of Work, in whole or in part, should the Plans of Record approved by the Permit (or any sheet, details, schematic, or collar note therein) prove to inaccurately reflect site conditions, standard construction methodologies, or practical construction considerations sufficient to require a change to the Plans of Record.
GC 20.		Prior to the start of Work, adequate erosion and sedimentation control measures shall be implemented, including any necessary controls not specifically referenced in the Plans of Record, and be maintained in effect throughout Project construction and until the Property has become stabilized with adequate vegetative cover or via alternate means, as approved by the Division. Structural failure of erosion and sedimentation controls may be subject to enforcement action subject to General Condition #2.
GC 21.		Failure to maintain an appropriate standard of care at any time during the installation or post-installation components of the Plans of Record, including but not limited to failure to restore and adequately control surface hydrology, planting at inappropriate times of year, failures to reach adequate surface hydrology, failure to provide adequate substrate, failure to implement adequate horticultural practices (such as irrigation, disease and pest control), failure to maintain erosion and sedimentation control, failure to adequately control invasive plant species, or the loss of required plantings or seeding, shall be deemed non-compliance with this Permit at the sole discretion of the Division subject to General Condition #2.
GC 22.		<u>Permit Coordination:</u> The Work shall be conducted in accordance with any conditions imposed on the Permit Holder relating to water quality per the Clean Water Act Section 404 permit issued by the Army Corps of Engineers and the Clean Water Act Section 401 Water Quality Certificate (314 CMR 9.00) issued by MA Department of Environmental Protection. All materials submitted in pursuit of or in compliance with the 401 Water Quality Certification or U.S. Army Corps of Engineers 404 shall also be submitted to the Division in writing concurrent with submittal to the permitting agency. Compliance with the 401 Water Quality Certification and 404 Permit shall be considered a condition of this Permit and any violations shall be reviewed by the Division pursuant to GC #9. This Permit also authorizes any protective measures or conditions required by the National Marine Fisheries Service related to Sturgeon, which shall be required by and incorporated herein under this Permit.

H. Special Conditions:

SC 1.		Work Authorized by the Permit: This Permit authorizes the installation and use of the unauthorized construction access road in and on the Merrimack River substrate for the purpose of bank stabilization and the work necessary to remove the construction access road. This Permit includes the removal of all unpermitted riprap and soil from the impacted area of the unpermitted road as documented in *Attachment 2* and completion of the 2022 Project (*Attachment 1*). The Work also includes removal of the prior turbidity curtain torn from the anchors within the River, as necessary, and any onsite activity required by the Division as a condition of this Permit.
SC 2.		Time of Year Restrictions: 1) *Completion of the 2022 Project & removal of the road.* All work below Mean Annual High Water shall only occur between July 15, 2023 and September 30, 2023, unless otherwise allowed in writing by the Division. 2) *Removal of the Turbidity Curtain and, if so required, the Corrective Plan of Action*. Work below Mean Annual High Water shall not occur between April 1 and July 15.
SC 3.		Post-Construction As-Built Survey: A post-construction as-built survey must be completed to demonstrate that the grades of the river have returned to pre-work conditions and that all work is in compliance with the 2022 Plans. The As-Built Survey shall be submitted within 6 months of the completion of the work and, if necessary, highlight and quantify any areas not in compliance with the 2022 Plans and proposed corrective actions or monitoring actions.
SC 4.		Sturgeon Protection Plan: All Work shall be subject to the Sturgeon Protection Plan (SPP, Attachment 4), which has been re-approved for the current project. The SPP shall be implemented as written or as otherwise required herein. Any proposed changes to the SPP shall be submitted for review and written approval by the Division prior to implementation of proposed changes. The following shall be implemented as part of the SPP: a. A biologist shall be present during all work permitted herein. The biologist shall have the right to stop work and guide operators to help minimize river Sturgeon habitat impacts while removing riprap and bank fill from the River. b. The onsite Division-approved biologist will perform a visual and, as useful, tactile sweep of completed areas to search for remaining riprap stones. Care will be taken to minimize scarification and dredging while completely removing riprap. c. Should a Sturgeon be observed within the area behind the turbidity curtain, all work below Mean Annual High Water will stop. The curtain will be opened to allow the sturgeon to move from behind the curtain. The area behind the turbidity curtain will be visually inspected to ensure that the Sturgeon has left the area. Work may commence only once the biologist has confirmed that the Sturgeon has left this enclosure and the turbidity curtain is re-established and is fully functional. We note that the measures approved as part of the SPP shall be considered *minimum actions necessary*. Any additional actions deemed necessary or protective of Sturgeon by the qualified biologist, the

		Division, or NOAA-National Marine Fisheries Service biologists -including, but not limited to, cessation of work or modification of construction methods, additional barriers, additional sweeps, additional sound protective measures or monitoring, and sound attenuation methods - shall be implemented by the Permit Holder and any contractors. The Division shall be notified of any such additional measures in writing within 24 hours of implementation.
SC 5.		Construction Sound Thresholds: Noise levels were monitored in 2022 during earlier stages of project. Sound levels were low enough to avoid behavioral or injury thresholds for Sturgeon[2]. The work to remove the road and complete the bank stabilization in 2023 will occur when water is away from the unpermitted construction access road and during low water, so is not anticipated to rise to levels of concern. However, the approved biologist may elect, at their own discretion, to initiation sound monitoring and adjust the SPP accordingly as allowed in SC 4. The Permit Holder is required to implement the sound monitoring and implement any additional protective measures as required by SC 4.
SC 6.		Temporary In-Water Structures: At the end of the construction and demobilization of the Project, the Permit Holder shall remove all in-water structures not approved in the 2022 Plans - including, but not limited to - the turbidity curtain(s), anchors and chains to hold the turbidity curtain, construction equipment, riprap and construction debris no later than September 30, 2023.
SC 7.		Erosion and Sedimentation Controls: All erosion and sedimentation controls shall be removed and properly disposed of after Work activities are complete. Removal of controls above Mean Annual High Water may occur at a later date than the completion of the road removal, but shall be as soon as such erosion and sedimentation control removal is approved by the Haverhill Conservation Commission.
SC 8.		Post-Construction Restoration and Monitoring Plan: No later than May 15, 2023, the Proponent shall submit a written plan detailing methods to monitor the areas below Mean Annual High Water impacted by the construction access roadway. The Post-Construction Restoration and Monitoring Plan must include a minimum of three (3) surveys conducted by a qualified biologist at the following specified intervals: a) shortly after the road removal work is completed to document immediately post-restoration conditions, or, if flows are too high, as soon as feasible. b) An additional survey shall occur by the qualified biologist one year after the initial post-road removal survey and after at least one fall, winter and spring flow season to determine if the site is stable over the range of normal seasonal Merrimack River flow regimes. c) The last visit will occur three years after the initial post-road removal survey. Persistent drought conditions or lack of seasonal bed-load movement storms or other factors may require that the specific years and dates of the visits are modified by the Division or recommended by the biologist conducting the monitoring.

[2] Criteria developed by the Fisheries Hydroacoustic Working Group for the protection of all fish including green sturgeon are: (a) Injury – peak level of 206 dB re 1 µPa AND a cumulative SEL level of 187 dB, and (b) Behavioral Modification - 150 dB re 1 µPa root-mean-squared. Caltrans. 2015. Technical Guidance for Assessment and Mitigation of Hydroacoustic Effects of Pile Driving on Fish. Report Number: CTHWANP-RT-15-306.01.01, 532 pages.

		Reporting: A written report shall be submitted by the end of the calendar year of each site visit that includes written observation, photos, and recommendations. Minor, reasonable actions may occur at any time during the monitoring period (e.g., hand-removal of riprap or construction debris) subject to SC 2 if reviewed and approved by the Division and other permitting agencies. The final report shall detail any areas that have not been restored to pre-impact conditions and specify proposed measures for restoration actions for incorporation into a Corrective Plan of Action.
SC 9.		Corrective Plan of Action: The Division will utilize the final monitoring report and other materials, as required, to determine if a Corrective Plan of Action is required to restore impacting habitats. If so required by the Division, the Permit Holder shall submit a draft Corrective Plan of Action for Division review and written approval. The Plan must be submitted no later 60 days after a written request from the Division. The Plan requires a clear implementation timeline with field work occurring between July 15 and September 30. The goal of the Corrective Plan is to propose and implement measures to restore areas to pre-work conditions. The Corrective Plan of Action shall incorporate avoidance, minimization and mitigation measures and methods for the proposed work and specify whether barge support is necessary. SumCo, contractor for the project, estimates that such work would not exceed $10,000. The MeVa Funding Letter provided documentation to the Division that the funds for the Corrective Plan of Action are included in the existing federal grant (FTA Award #MA-2023-002-00). Such funds are available until the completion of all work associated with the grant but must be paid out on a re-imbursement basis.
SC 10.		Sturgeon Conservation/Research: In order to provide a Net Benefit to the conservation of the State-listed species impacted by this Project, the Permit Holder has proposed to provide funding in the amount of $68,221 (the "Net Benefit Funds") for the implementation of a field study on Young of Year Sturgeon as proposed by SWCA (Re: Cost Proposal for Merrimack River YOY Sturgeon Research Study, dated March 30, 2023, attached to the MEVA Funding Letter). The proposed study would support underwater surveys to determine the extent, location and utilization of sand flats in the spawning area of the Merrimack River or other areas of the River as directed by the Division. The survey would be completed by Dr. Steve Johnson of SWCA, and the findings would be presented in a summary report at the end of the monitoring period. Interim reports summarizing survey results would be prepared and provided to the fisheries agencies following each survey. The MeVa Funding Letter provided documentation to the Division that the Net Benefit Funds are included in the existing federal grant (FTA Award #MA-2023-002-00). Such funds are available until the completion of all work associated with the grant, but must be paid out on a re-imbursement basis. **No later than the end of calendar year 2023**, SWCA shall submit a detailed written protocol for the implementation of the study, estimated to occur over three-years. The first year of the study will not initiate until the first full spring, winter, fall cycle after the work is completed, unless otherwise allowed in writing by the Division.
SC 11.		Future Maintenance, Repair, Replacement of the Bank Stabilization, including the Undulations: Should the Permit Holder wish to request these activities be considered subject to this Permit, a written Operation & Maintenance and or Vegetation Maintenance plan for such activities with a narrative shall be submitted to the Division in accordance with GC 8 and GC 9. The narrative shall also list all non-MESA permits expected to be required for the proposed work.

SC 12.		Dead or Injured Sturgeon: The Permit Holder and/or the biologist(S) are required to immediately report any injured or dead Sturgeons and, to the greatest extent possible, recover any carcass or parts thereof. Injured fish shall be immediately placed into a protective area outside of any work area. The project will coordinate with Micah Kieffer (United States Geological Service, who has a federal ESA permit, to collect any killed fish or, when possible, render first aid to the fish). If Kieffer is not available, staff from the MA Division of Fisheries and Wildlife or MA Division of Marine Fisheries shall be notified of the need for assistance. Carcasses or parts thereof shall be placed in a large cooler full of ice as soon as possible and the Division immediately notified at misty-anne.marold@mass.gov and Jason.carmignani@mass.gov. and Patricia.Huckery@mass.gov.
SC 13.		Construction Staff Education: All construction, landscaping, and other sub-contractors associated with the Project shall be informed in writing of the likely presence of State-listed species on the Property and what measures should be implemented to minimize direct harm to State-listed Species. Further, no wildlife shall be removed from the Property without approval of a qualified, Division-approved wildlife biologist or the Division except as necessary to receive veterinary treatment in the case of harm during construction.
SC 14.		Observations of State-listed Species: The Division shall be notified, in the form of an NHESP Rare Animal or Plant Observation Form, within forty-eight (48) hours of the siting of a Sturgeon within the work area and within ten (10) days of the observation of any other State-listed species within or outside the limits of Work. Visit https://www.mass.gov/how-to/report-rare-species-vernal-pool-observations for access to observation reporting forms and information on submitting data through Heritage Hub (preferred).

Notice of Appeal of Rights:

This Permit is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.23. Any person aggrieved by this decision shall have the right to an adjudicatory hearing at the Division pursuant to M.G.L. c. 30A, s.11 in accordance with the procedures for informal hearings set forth in 801 CMR 1.02 and 1.03.

Any notice of claim for an adjudicatory hearing shall be made in writing and be accompanied by a filing fee in the amount of $500.00. The notice of claim shall be sent to the Division by certified mail, hand delivered or postmarked within twenty-one (21) days of the date of issuance of this Permit to:

Mark S. Tisa, Director
Massachusetts Division of Fisheries and Wildlife
Field Headquarters
One Rabbit Hill Road
Westborough, MA 01581

Any notice of claim for an adjudicatory hearing shall include the following information:

1. The file number for the project;
2. The complete name, address and telephone number of the person filing the request, and the name, address and telephone number of any authorized representative;
3. The specific facts that demonstrate that a party filing a notice of claim satisfies the requirements of an "aggrieved person," including but not limited to (a) how they have a definite interest in the matters in contention within the scope of interests or area of concern of M.G.L. c. 131A or the regulations at 321 CMR

10.00 and (b) have suffered an actual injury which is special and different from that of the public and which has resulted from violation of a duty owed to them by the Division;

4. A clear statement that an adjudicatory hearing is being requested;
5. A clear and concise statement of facts which are grounds for the proceeding, the specific objections to the actions of the Division and the basis for those objections; and the relief sought through the adjudicatory hearing; and a statement that a copy of the request has been sent by certified mail or hand delivered to the applicant and the record owner, if different from the applicant.

Everose Schlüter, Ph.D.
Assistant Director

Conservation and Management Permit 023-417.DFW

Issued: April 27, 2023

Expires: April 27, 2028

Acknowledgement and Acceptance of all Terms of this Permit

The undersigned below agrees that commencement of any work authorized by and described in this Permit constitutes acknowledgement and acceptance of all terms of this Permit.

Signatory 1 Organization

COMMONWEALTH OF MASSACHUSETTS

On this _____day of _____, 20___, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification which was _____ to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Notary Public:

_____

SEAL

My Commission Expires: _____

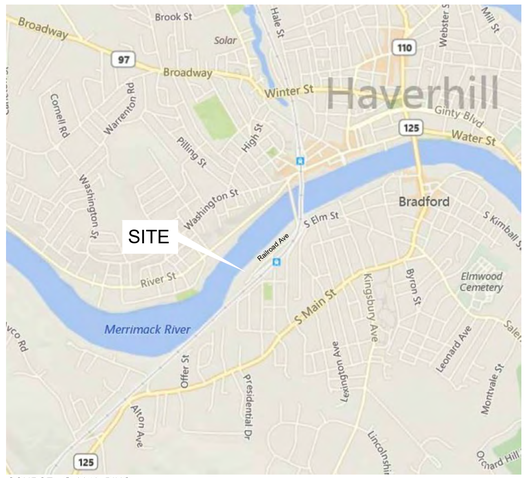
Distribution List

Mayor James J. Fiorentini, Haverhill
Eric Papetti, FTA
Paul Sneeringer, U.S. Army Corps of Engineers
Roosevelt Mesa, NOAA-NMFS
Alicia Geilen, Wetlands Circuit Rider for the Northeast Regional Office
Kyle Lally, MA DEP
Forest Schenck, MA DFW
Paige Czepiga, MA MEPA
Rob Moore, Haverhill Conservation Commission
Daniel Bourdeau, Geosyntec Consultants, Inc.

Attachment 1

RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY 85 RAILROAD AVENUE HAVERHILL, MASSACHUSETTS JULY 2021. Dated July 2021, last revised 1/2022. Sheets 1-10. Prepared by Geosyntec Consultants

RIVERBANK STABILIZATION PROJECT
MVRTA OPERATING FACILITY
85 RAILROAD AVENUE
HAVERHILL, MASSACHUSETTS
JULY 2021



SOURCE: @ 2019, BING

VICINITY MAP
NOT TO SCALE

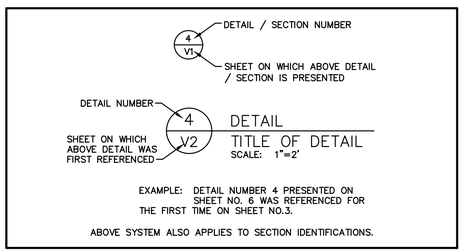
List of Drawings		
Sheet Number	Drawing Title	Revision
1	COVER SHEET	I
2	GENERAL NOTES AND ABBREVIATIONS	I
3	EXISTING CONDITIONS	I
4	RESTORATION PLAN	I
5	SECTIONS A – D	I
6	SECTIONS E – H	I
7	CONSTRUCTION STAGING AREAS AND ACCESS ROUTE	I
8	EROSION AND SEDIMENT CONTROL PLAN	I
9	RESTORATION PLANTING PLAN	I
10	DETAILS	I

SOURCE: MAP DATA @ 2019, GOOGLE

LOCATION MAP
NOT TO SCALE

PREPARED FOR:

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY
85 RAILROAD AVENUE
HAVERHILL, MASSACHUSETTS 01835



DETAIL / SECTION IDENTIFICATION LEGEND

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
H	11/2021	AGENCY COMMENTS	RMK	DB JK
G	07/2021	AGENCY COMMENTS	RMK	DB JK
F	05/2021	REVISED MEAN LOW WATER LINE	RMK	DB
E	03/2021	AGENCY COMMENTS	RMK	DB
D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MVRTA
MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: COVER SHEET

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: MN	DATE: JULY 2021
DRAWN BY: RMK	PROJECT NO.: BR0494
CHECKED BY: MN	FILE:
REVIEWED BY: DB	DRAWING NO.: 1 OF 10
APPROVED BY: DB	

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GENERAL NOTES:

1. EXISTING CONDITIONS, WITH THE EXCEPTION OF THE 2019 SITE SURVEY CONDUCTED BY WSP, WERE PROVIDED BY MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY (MVRTA) FROM AS-BUILT DRAWINGS DATED MARCH 2009.
2. TOPOGRAPHIC AND BATHYMETRIC SURVEYS WERE CONDUCTED BY WSP IN APRIL 2019 AND JUNE 2019, RESPECTIVELY. THE HORIZONTAL DATUM REFERENCES THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83 - US FOOT). THE VERTICAL DATUM REFERENCES THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).
3. SCALES NOTED ON DRAWINGS APPLY TO FULL-SIZE (I.E., 22" X 34") SHEETS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROPERLY COORDINATE WORK AND SCHEDULE MATERIAL DELIVERIES. THE MATERIAL BEING SUPPLIED BY OTHERS MUST BE COORDINATED WITH THE OWNER REPRESENTATIVE AND SUBCONTRACTORS WORKING ON THE SITE. MATERIALS WILL NEED TO BE PROPERLY STOCKPILED BY THE CONTRACTOR IN AN AREA APPROVED BY THE OWNERS REPRESENTATIVE.
5. ALL MONITORING WELLS SHALL BE PROTECTED, PRESERVED, AND/OR EXTENDED AS NECESSARY BY THE CONTRACTOR SO THAT LOCATIONS MAY BE USABLE FOR FUTURE WATER LEVEL MONITORING AND GROUNDWATER SAMPLING.
6. THE CITY OF HAVERHILL OPERATES A MUNICIPAL WASTEWATER SIPHON ADJACENT TO THE PROPOSED LIMITS OF WORK. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE UN-IMPEDED ACCESS TO THE SIPHON THROUGHOUT CONSTRUCTION. IF ACCESS WILL BE LIMITED DUE TO NECESSITY OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR WILL NOTIFY THE CITY OF HAVERHILL A MINIMUM OF 7 DAYS PRIOR TO THE PLANNED OBSTRUCTION.
7. REFER TO INDIVIDUAL SHEETS FOR DRAWING-SPECIFIC NOTES AND LEGENDS.
8. VERTICAL DATUMS REFERENCED IN THIS PLAN ARE IN FEET NGVD 29 AND WERE WERE DERIVED BY TRANSLATING THE TIDAL DATUM FROM NOAA SECONDARY STATION 8440889 (RIVERSIDE, MERIMACK RIVER MA) LOCATED APPROXIMATELY 4 RIVER MILES DOWNSTREAM AT THE BATES BRIDGE AT ROUTE 97 IN HAVERHILL, MA, UPSTREAM TO THE SITE USING USGS GAGE 01100693 LOCATED AT THE ROUTE 125 BRIDGE IMMEDIATELY DOWNSTREAM OF THE SITE.
   THE FOLLOWING EQUATION CAN BE USED TO CONVERT ELEVATIONS IN THIS PLAN FROM VERTICAL DATUM NGVD 29 TO NAVD 88: NAVD88 = NGVD29 - 0.8 FEET.

Vertical Datum		Elevation (feet, NGVD 29)
High Tide Line	HTL	6.8
Mean Higher-High Water	MHHW	6.72
Mean High Water	MHW	6.08
Mean Tide Line	MTL	4.23
Mean Sea Level	MSL	4.08
Mean Diurnal Tide Level	DTL	4.44
Mean Low Water	MLW	0.38
Mean Lower-Low Water	MLLW	0.25

REV	DATE	DESCRIPTION	DRN	APP
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C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MVRTA MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: GENERAL NOTES AND ABBREVIATIONS

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY:	MN	DATE:	JULY 2021
DRAWN BY:	RMK	PROJECT NO.:	BR0494
CHECKED BY:	MN	FILE:	
REVIEWED BY:	DB	DRAWING NO.:	2 OF 10
APPROVED BY:	DB		

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MEAN LOW LOW WATER, MLLW EL = 0.25' FT NGVD

MEAN LOW WATER, MLW EL = 0.4' FT NGVD

MEAN HIGH WATER, MHW EL = 6.1 FT NGVD

HIGH TIDE LINE EL = 6.8 FT NGVD

10 YEAR FLOOD ELEVATION (16.8 FEET NGVD29)

100 YEAR FLOOD ELEVATION (EL 23.9' NGVD29 - FEMA)

MERRIMACK RIVER (FLOW)

WSP UPDATED SURVEY JUNE OF 2019

WSP UPDATED SURVEY APRIL OF 2019

CULVERT 12" RCP ELEV: 13.20'

CULVERT 4 42"CV PIPES INSIDE 12"RCP ELEV: 13.33'

CULVERT 4" DI ELEV: 23.93'

MAJOR EROSION

RIP RAP

STONE SWALE

DOWNSPOUT WITH NO FLEX PIPE OR ENERGY DISSIPATION

OUTLET THROUGH WALL APPROXIMATELY 4 FT ABOVE GROUND SURFACE. NO FLEX PIPE OR ENERGY DISSIPATION

BUILDING

GARAGE

OFFICE

FORMER BUILDING

RIVERFRONT 100 FT

RIVERFRONT 200 FT

CITY OF HAVERHILL MUNICIPAL WASTEWATER SIPHON

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

RAILROAD AVENUE (AS POSTED - LEGAL STATUS UNKNOWN)

N/F MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

STONE BOUND (FOUND & HELD)

LOT AREA=15,900± SQ. FT.

SEE NOTE 6

LEGEND

- CHAIN LINK FENCE
- DRAIN LINE
- INTERMEDIATE CONTOURS
- INDEX CONTOURS
- EDGE OF WATER
- WSP UPDATED SURVEY LIMITS (APRIL 2019)
- WSP UPDATED SURVEY LIMITS (JUNE 2019)
- RIPRAP
- SAND AND GRAVEL SUBSTRATE (NOTE 7)
- SAND SUBSTRATE (NOTE 7)
- SAND/GRAVEL/COBBLE/BOLDER SUBSTRATE (NOTE 7)

BOH	BUILDING OVERHANG
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
LSA	LANDSCAPED AREA
FFE	FINISHED FLOOR ELEVATION
CRW	CONCRETE RETAINING WALL
RCP	REINFORCED CONCRETE PIPE
PVC	POLYVINYL CHLORIDE
DI	DUCTILE IRON
(R)	RECORD INFORMATION
CNO	COULD NOT OBTAIN
INV.	INVERT

- STONE BOUND
- AIR CONDITIONER
- CATCH BASIN
- CULVERT
- DRAIN MANHOLE
- ELECTRIC BOX
- ELECTRIC HANDHOLE
- DECIDUOUS TREE
- SIGN (SINGLE POSTED)
- SHUTOFF VALVE
- LIGHT POLE
- ROOF DOWNSPOUT
- ROOF DOWNSPOUT FLEX PIPE

NOTES

1. THE HORIZONTAL DATUM SHOWN HEREON REFERENCES THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NAD83/ 2011 AND WAS ESTABLISHED BY RTK GPS SURVEY TECHNIQUES UTILIZING THE LEICA SMARTNET SYSTEM.

2. THE VERTICAL DATUM IS FEET ABOVE NGVD29.

3. THE SURVEYED INFORMATION SHOWN OUTSIDE THE LIMITS LABELED "WSP UPDATED SURVEY APRIL 2019" WAS TAKEN FROM CAD FILES ENTITLED "EXISTING CONDITIONS PLAN, MVRTA OFFICE MAINTENANCE FACILITY RENOVATIONS PHASE IV, DRAWING NUMBER C0.2", DATED MARCH 31, 2009 AND "EXISTING CONDITIONS PLAN, MVRTA OFFICE MAINTENANCE FACILITY RENOVATIONS PHASE IV, DRAWING NUMBER C0.3", DATED MARCH 31, 2009. BOTH CAD FILES WERE PREPARED BY NITSCH ENGINEERING.

4. THE UNDERGROUND UTILITY INFORMATION SHOWN HEREON LABELED WITH AN (R) ARE FROM RECORD DOCUMENTS. ADDITIONAL FIELD INVESTIGATION WILL BE REQUIRED BY OTHERS TO DETERMINE THE ACTUAL PIPE SIZE(S) AND TYPE(S).

5. THE 100 YEAR FLOOD ELEVATION SHOWN HEREON REFERENCES THE FEMA NATIONAL FLOOD HAZARD LAYER, JULY 2017, OBTAINED FROM MASSGIS AT: https://docs.digital.mass.gov/dataset/massgis-data-fema-national-flood-hazard-layer"

6. SAND AND GRAVEL SUBSTRATE LIMITS WERE DERIVED FROM A DIVER-LED SUBSTRATE SURVEY PERFORMED BY STEVE JOHNSON OF SWCA ON JUNE 3 AND 4, 2020.

UTILITY STATEMENTS

THE LOCATION OF THE UTILITIES AS SHOWN HEREON HAVE BEEN COMPILED FROM VISIBLE STRUCTURES AND INFORMATION OBTAINED FROM VARIOUS SOURCES. THE ACTUAL LOCATION OF ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE CONSIDERED APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICES OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED.

0 30 60

SCALE IN FEET

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
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D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
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B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: EXISTING CONDITIONS

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: MN	DATE: JULY 2021
DRAWN BY: RMK	PROJECT NO.: BR0494
CHECKED BY: MN	FILE:
REVIEWED BY: DB	DRAWING NO.: 3 OF 10
APPROVED BY: DB	

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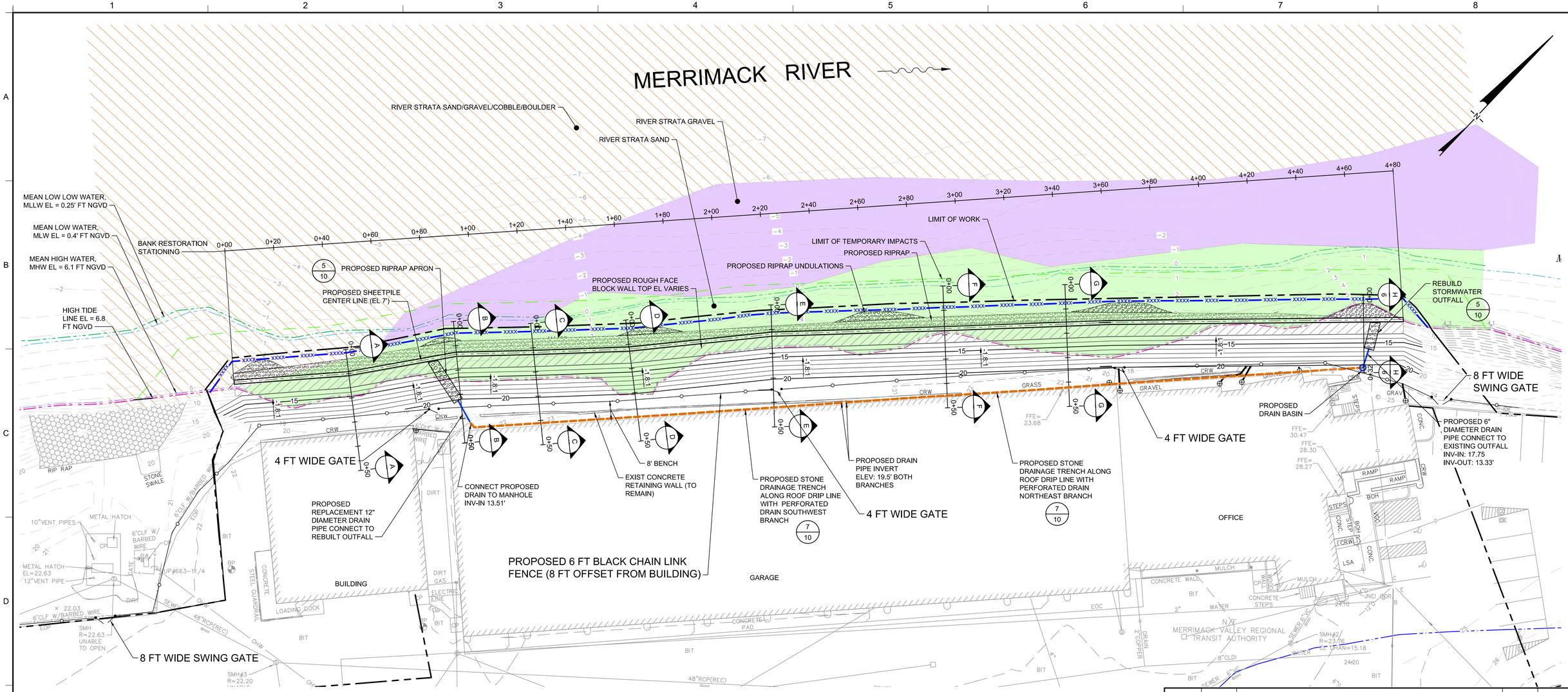

LEGEND

- PROPOSED SHEET PILE
- PROPOSED ROUGH FACE BLOCK WALL
- PROPOSED GRADING CONTOURS (1 FT INTERVAL)
- PROPOSED 10 FT SECURITY FENCE
- PROPOSED STONE DRAINAGE TRENCH
- xxxx xxxx TURBIDITY CURTAIN
- PROPOSED RIPRAP
- EXISTING RIPRAP
- SAND AND GRAVEL SUBSTRATE (NOTE 7, DRAWING 3)
- SAND SUBSTRATE (NOTE 7, DRAWING 3)
- SAND/GRAVEL/COBBLE/BOLDER SUBSTRATE (NOTE 7, DRAWING 3)

0 20 40
SCALE IN FEET

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A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: RESTORATION PLAN

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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SIGNATURE

8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY:	MN	DATE:	JULY 2021
DRAWN BY:	RMK	PROJECT NO.:	BR0494
CHECKED BY:	MN	FILE:	
REVIEWED BY:	DB	DRAWING NO.:	4 OF 10
APPROVED BY:	DB		

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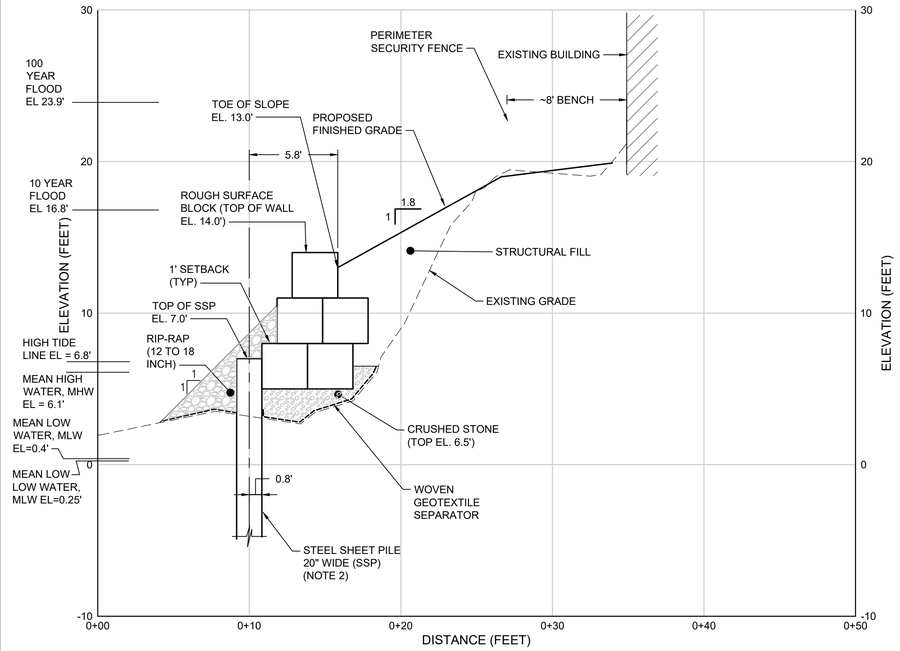
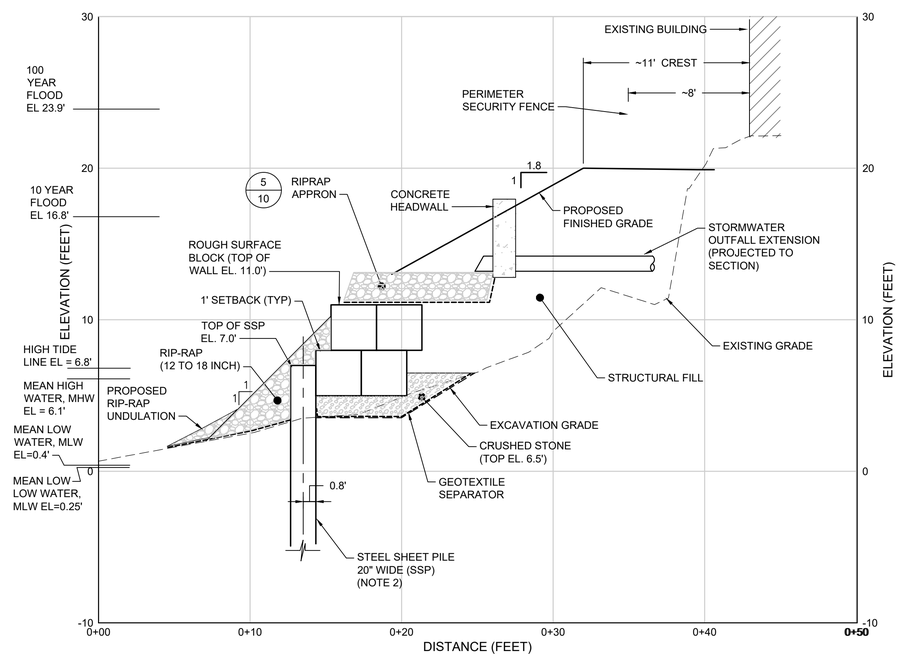


SECTION A



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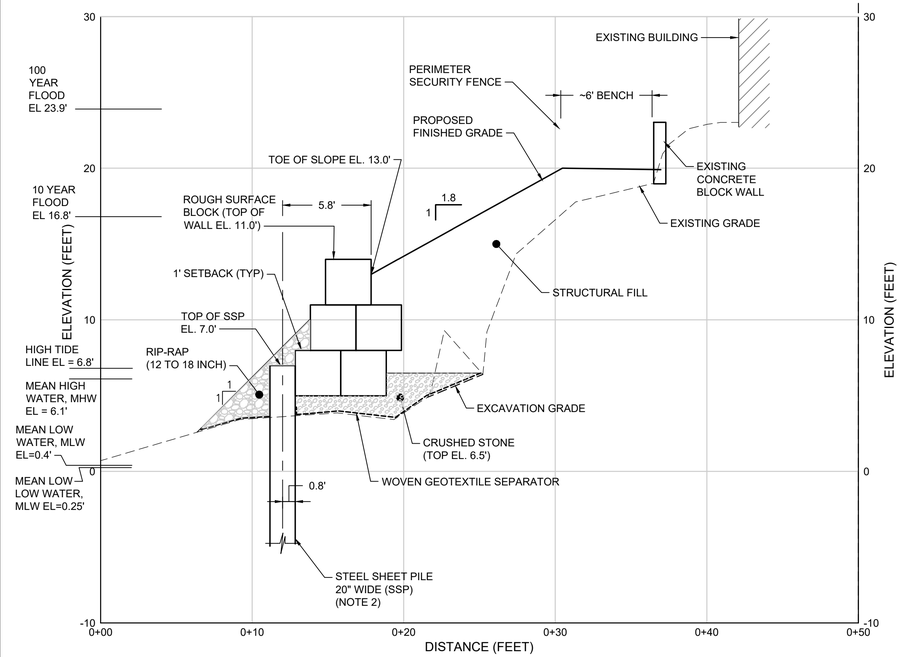

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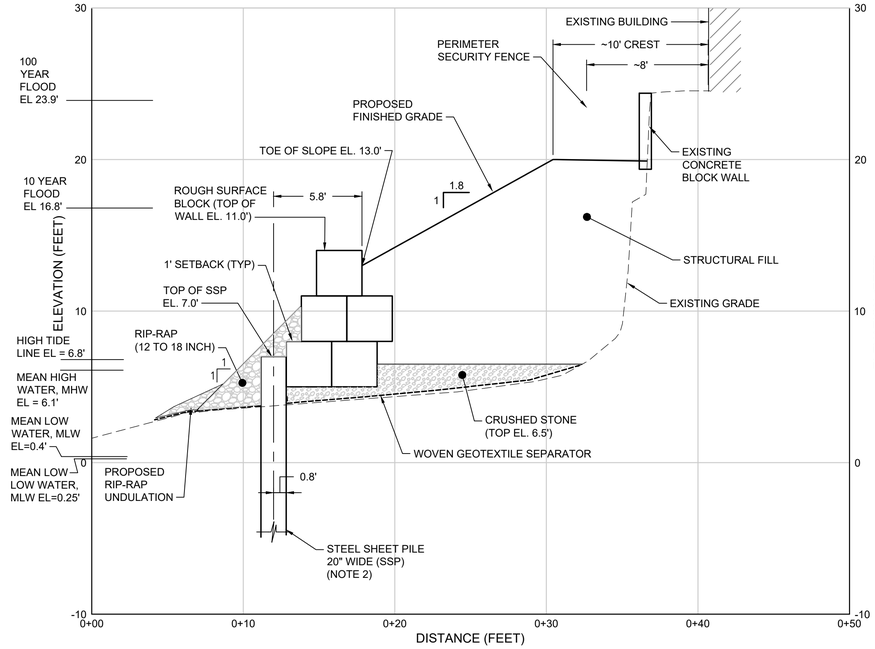

SECTION D

NOTES:

1. EXISTING CONDITIONS PLAN BASED ON EXISTING CONDITIONS SURVEY, MVRTA OPERATING FACILITY, 85 RAILROAD AVENUE, HAVERHILL, MA PREPARED BY WSP USA INC. DATED JUNE 4, 2019.
2. SHEETPILE SHALL BE PZ 40 WITH ELEVATION OF 7 FT AND TOE MAXIMUM TOE ELEVATION OF -15 FT (I.E. 22-FT LENGTH).
3. CRUSHED STONE SHALL CONFORM TO THE REQUIREMENTS OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES (2020) FOR M2.01.1 AGGREGATE.
4. CRUSHED STONE SHALL HAVE A MINIMUM THICKNESS OF 8 INCHES BENEATH THE ROUGH-SURFACED BLOCKS.

0 5 10
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
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D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: SECTIONS A - D

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: MN	DATE: JULY 2021
DRAWN BY: RMK	PROJECT NO.: BR0494
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APPROVED BY: DB	

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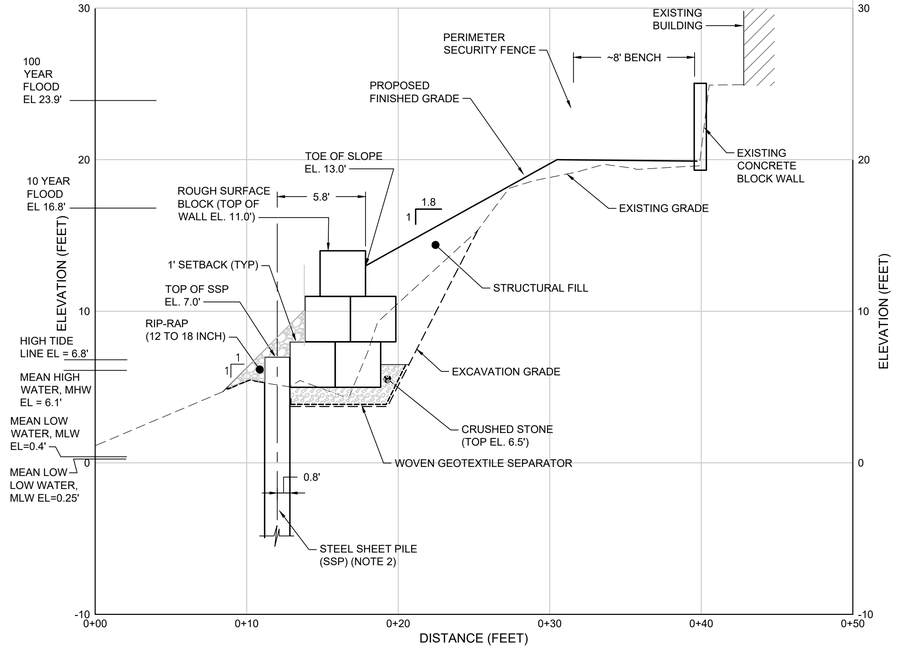
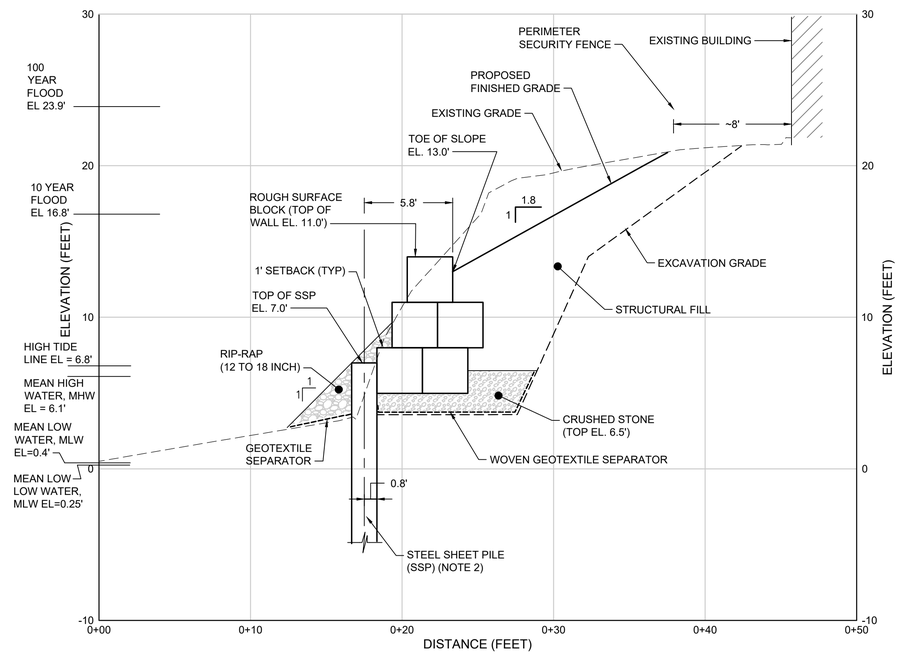


SECTION E



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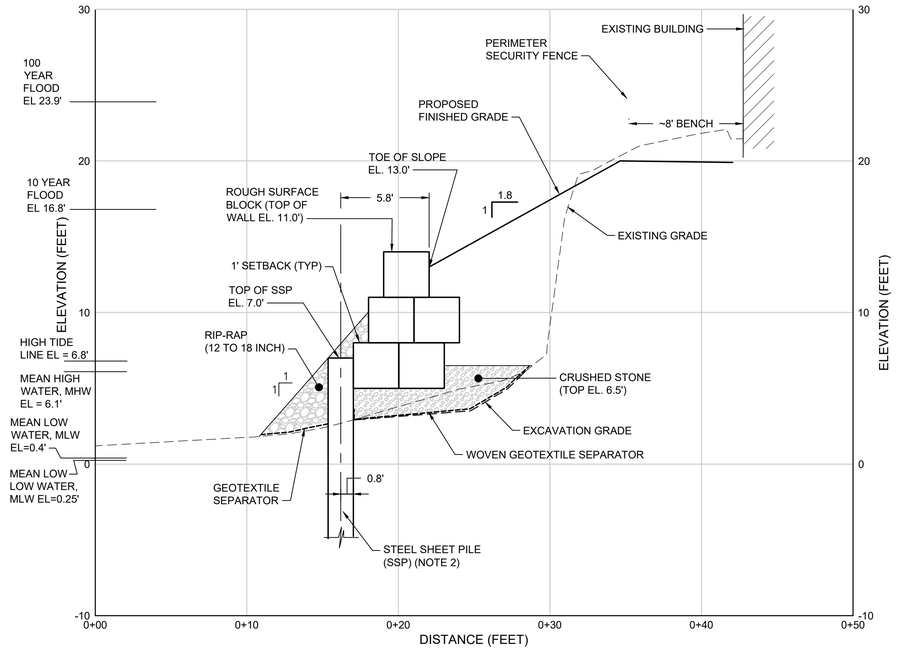
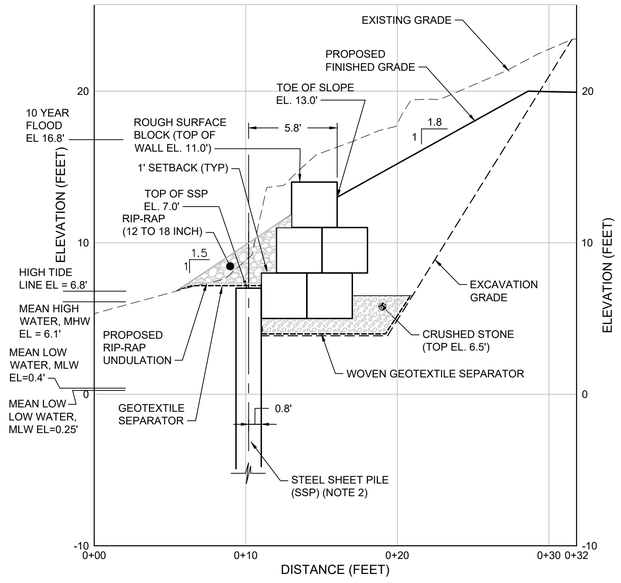


SECTION G



SECTION H

NOTES:

1. EXISTING CONDITIONS PLAN BASED ON EXISTING CONDITIONS SURVEY, MVRTA OPERATING FACILITY, 85 RAILROAD AVENUE, HAVERHILL, MA PREPARED BY WSP USA INC. DATED JUNE 4, 2019.
2. SHEETPILE SHALL BE PZ 40 WITH ELEVATION OF 7 FT AND TOE MAXIMUM TOE ELEVATION OF -15 FT (I.E. 22-FT LENGTH).
3. CRUSHED STONE SHALL CONFORM TO THE REQUIREMENTS OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES (2020) FOR M2.01.1 AGGREGATE.
4. CRUSHED STONE SHALL HAVE A MINIMUM THICKNESS OF 8 INCHES BENEATH THE ROUGH-SURFACED BLOCKS.

0 5 10
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
H	11/2021	AGENCY COMMENTS	RMK	DB JK
G	07/2021	AGENCY COMMENTS	RMK	DB JK
F	05/2021	REVISED MEAN LOW WATER LINE	RMK	DB
E	03/2021	AGENCY COMMENTS	RMK	DB
D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MVRTA MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: SECTIONS E - H

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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SIGNATURE

8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY:	MN	DATE:	JULY 2021
DRAWN BY:	RMK	PROJECT NO.:	BR0494
CHECKED BY:	MN	FILE:	
REVIEWED BY:	DB	DRAWING NO.:	6 OF 10
APPROVED BY:	DB		

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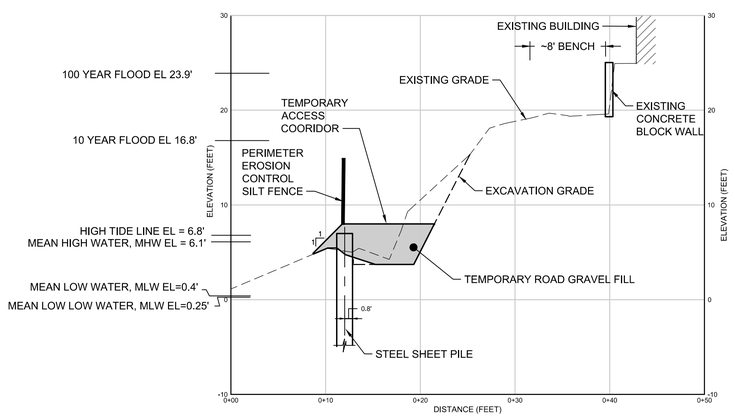
MERRIMACK RIVER

MEAN LOW LOW WATER, MLLW EL = 0.25' FT NGVD
MEAN LOW WATER, MLW EL = 0.4' FT NGVD
MEAN HIGH WATER, MHW EL = 6.1 FT NGVD
HIGH TIDE LINE EL = 6.8 FT NGVD
10 YEAR FLOOD ELEVATION (16.8 FEET NGVD29)
100 YEAR FLOOD ELEVATION (EL 23.9' NGVD29 - FEMA)
RIVER STRATA GRAVEL
RIVER STRATA SAND/GRAVEL/COBBLE/BOULDER
RIVER STRATA SAND
TURBIDITY CURTAIN
LIMIT OF WORK
APPROXIMATE LIMIT OF GRADING / SHEETPILE
TYPICAL ACCESS CORRIDOR SECTION SHOWN BELOW
CONSTRUCTION SUPPORT TRANSPORT CORRIDOR
TEMPORARY GATE (INSTALLED AND SUPPLIED BY THE CONTRACTOR)
EQUIPMENT AND MATERIAL STAGING AREA
CONSTRUCTION SUPPORT AND BARGE LOADING AREA
MUNICIPAL SIPHON ACCESS
CONSTRUCTION VEHICLE WARNING SIGNAGE
CONSTRUCTION PATHWAY
SECURITY GATE
BUILDING
GARAGE
FORMER BUILDING
20,000 GAL UNDERGROUND FUEL STORAGE TANK (REC)
CULVERT 12 RCP ELEV: 13.20
CULVERT 4" DI ELEV: 23.93'
CULVERT 2 PVC PIPES 1 12"RCP ELEV: 24.33'
FFE= 23.68
FFE= 30.42
FFE= 28.30
FFE= 28.27
MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY
RAILROAD AVENUE
(AS POSTED - LEGAL STATUS UNKNOWN)
LOT AREA=15,900± SQ. FT.
38'
86'

LEGEND

CONSTRUCTION VEHICLE ACCESS ROUTE (TO BE COORDINATED WITH MVRTA BUS TRAFFIC) (MAY REQUIRE DEDICATED FLAGGER)

0 30 60
SCALE IN FEET



TYPICAL ACCESS CORRIDOR SECTION

0 8'
SCALE IN FEET

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
H	11/2021	AGENCY COMMENTS	RMK	DB JK
G	07/2021	AGENCY COMMENTS	RMK	DB JK
F	05/2021	REVISED MEAN LOW WATER LINE	RMK	DB
E	03/2021	AGENCY COMMENTS	RMK	DB
D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MVRTA MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: CONSTRUCTION STAGING AREAS AND ACCESS ROUTE

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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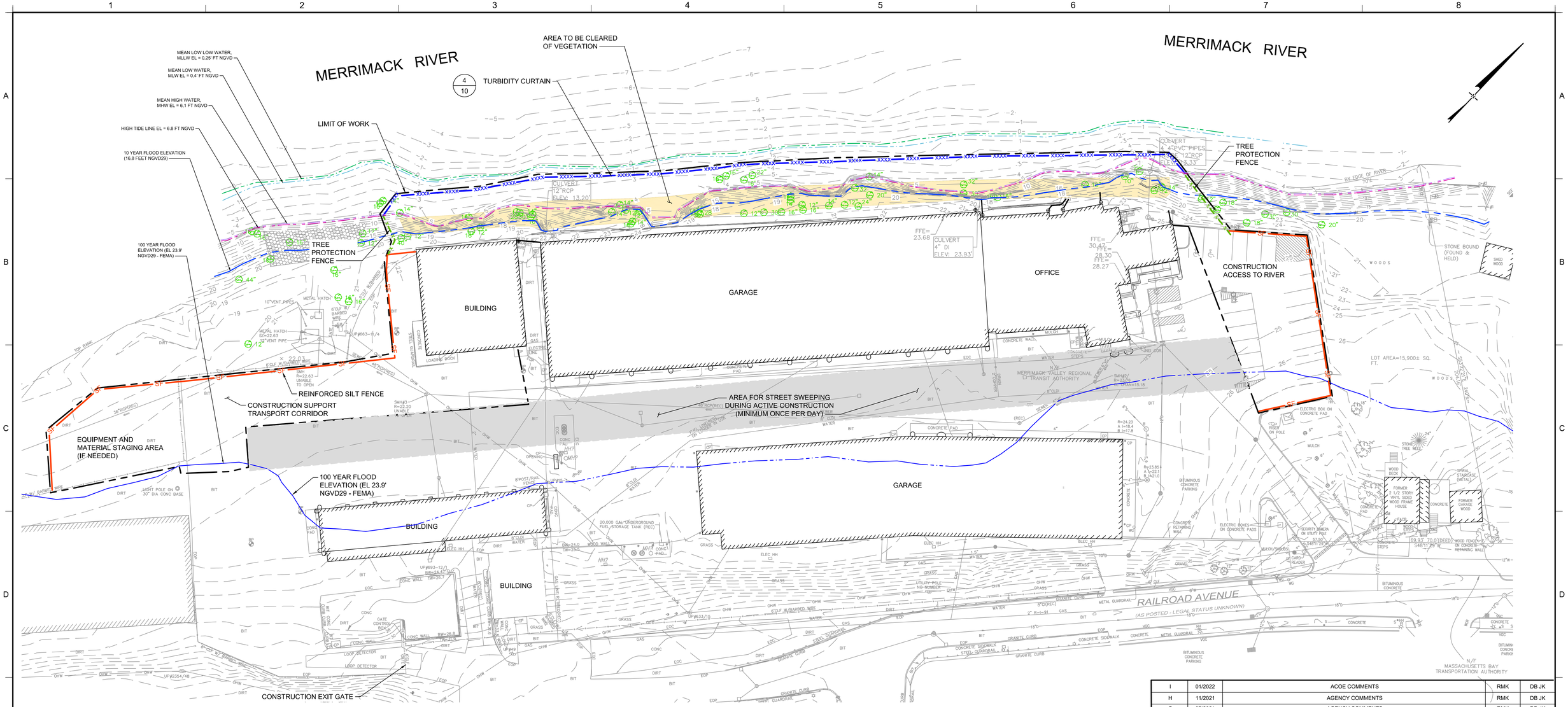
SIGNATURE

8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: MN	DATE: JULY 2021
DRAWN BY: RMK	PROJECT NO.: BR0494
CHECKED BY: MN	FILE:
REVIEWED BY: DB	DRAWING NO.: 7 OF 10
APPROVED BY: DB	

T:\Projects_CAD\MMVRTA\DRAWINGS\BR0494 D007 (STAGING AREA).dwg Last Edited By:RKOHLSTROM



LEGEND

- SF — REINFORCED SILT FENCE
- X — X — X — X — X — TREE PROTECTION FENCE
- XXXX — XXXX — TURBIDITY CURTAIN
- — — — LIMIT OF WORK
- AREA FOR STREET SWEEPING DURING ACTIVE CONSTRUCTION (MINIMUM ONCE PER DAY)

0 30 60
SCALE IN FEET

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
H	11/2021	AGENCY COMMENTS	RMK	DB JK
G	07/2021	AGENCY COMMENTS	RMK	DB JK
F	05/2021	REVISED MEAN LOW WATER LINE	RMK	DB
E	03/2021	AGENCY COMMENTS	RMK	DB
D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: EROSION AND SEDIMENT CONTROL PLAN

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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SIGNATURE

8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY:	MN	DATE:	JULY 2021
DRAWN BY:	RMK	PROJECT NO.:	BR0494
CHECKED BY:	MN	FILE:	
REVIEWED BY:	DB	DRAWING NO.:	8 OF 10
APPROVED BY:	DB		

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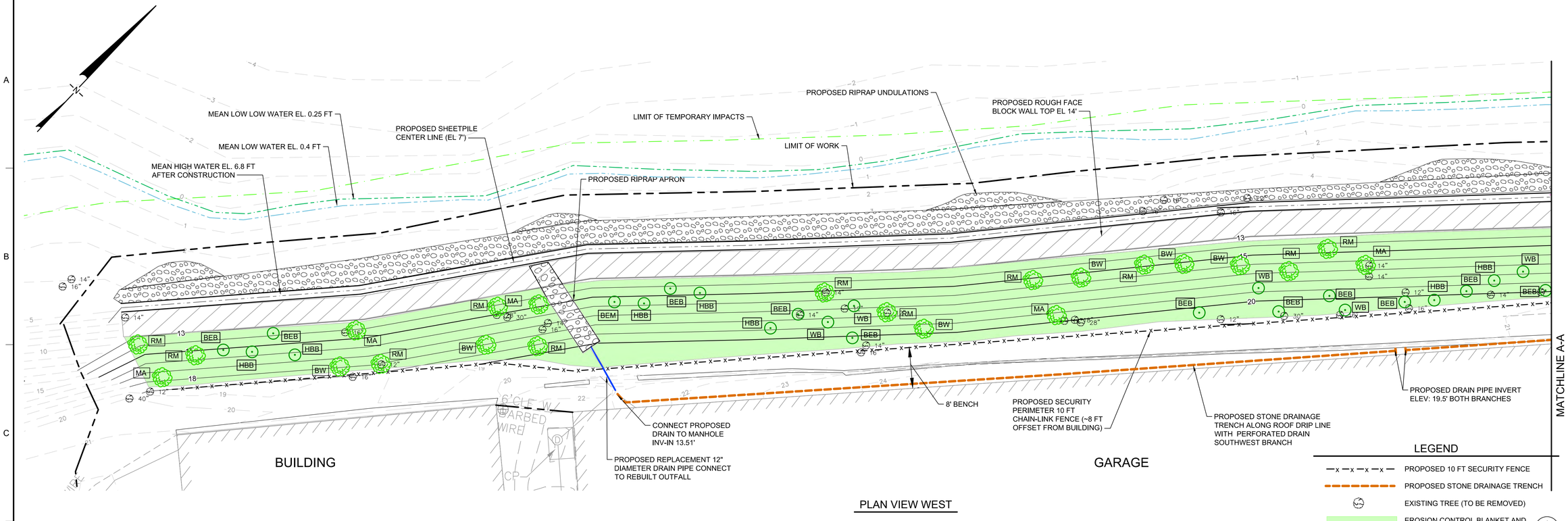

PLAN VIEW WEST

PLAN VIEW EAST

LEGEND

- PROPOSED 10 FT SECURITY FENCE
- PROPOSED STONE DRAINAGE TRENCH
- EXISTING TREE (TO BE REMOVED)
- EROSION CONTROL BLANKET AND PERMANENT SEED MIX (1/10)
- TREE PLANTINGS
- BUSH PLANTINGS

PLANTING SCHEDULE

Species Common Name	Species Scientific Name	Size	Minimum Spacing	Quantity
TREES				
Red Maple	Acer rubrum	3'-4'	8' O.C.	17
Moutain Ash	Sorbus americana	3'-4'	8' O.C.	9
Butternut Walnut	Juglans cinerea	3'-4'	8' O.C.	5
SHRUBS				
Highbush Blueberry	*Vaccinium corymbosum*	18"-24"	6' O.C.	15
Balck Elderberry	Sambucus canadensis	18"-24"	6' O.C.	21
Winterberry	Ilex verticillata	18"-24"	6' O.C.	5

REV	DATE	DESCRIPTION	DRN	APP
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G	07/2021	AGENCY COMMENTS	RMK	DB JK
F	05/2021	REVISED MEAN LOW WATER LINE	RMK	DB
E	03/2021	AGENCY COMMENTS	RMK	DB
D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: RESTORATION PLANTING PLAN

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY:	MN	DATE:	JULY 2021
DRAWN BY:	RMK	PROJECT NO.:	BR0494
CHECKED BY:	MN	FILE:	
REVIEWED BY:	DB	DRAWING NO.:	9 OF 10
APPROVED BY:	DB		

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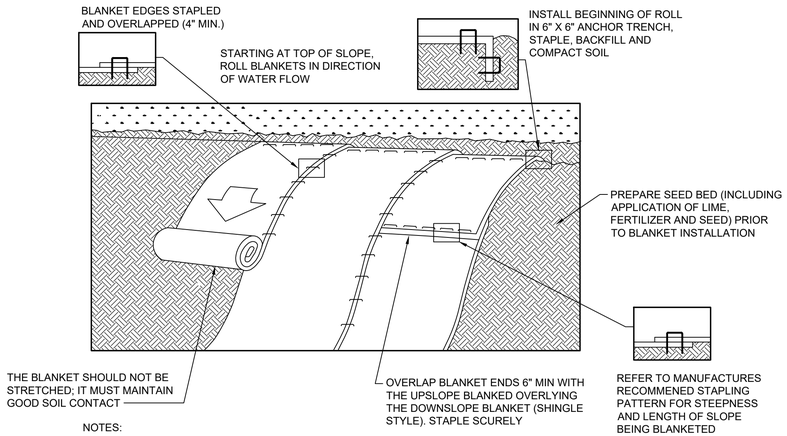
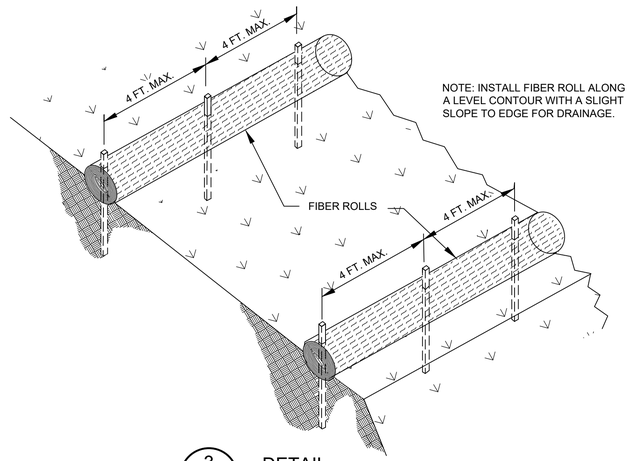


NOTES:

1. PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS.
3. BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.
4. THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.

1/5 DETAIL
EROSION CONTROL BLANKET
SCALE: NTS
XREF:



3/- DETAIL
FIBER ROLL
SCALE: NTS
XREF:

PA DEP

Rule of thumb: If you are seeing a lot of bare ground, there is not enough straw. (Caution: Too much straw can be as harmful as too little straw.)

Mulches should be applied at the rates shown in Table 11.6

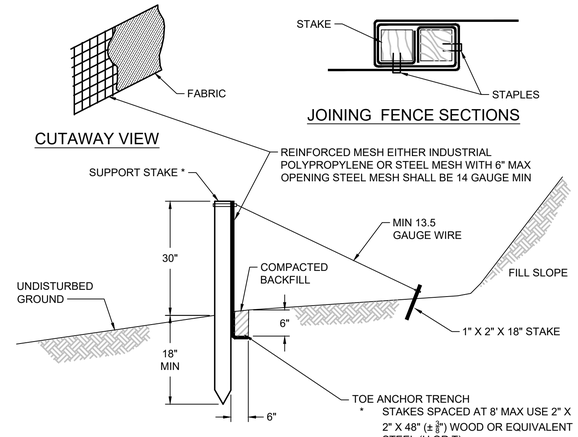
Straw and hay mulch should be anchored or tackified immediately after application to prevent being windblown. A tractor-drawn implement may be used to "crimp" the straw or hay into the soil — about 3 inches. This method should be limited to slopes no steeper than 3H:1V. The machinery should be operated on the contour. Note: Crimping of hay or straw by running over it with tracked machinery is not recommended.

Polymeric and gum tackifiers mixed and applied according to manufacturer's recommendations may be used to tack mulch. Avoid application during rain and on windy days. A 24-hour curing period and a soil temperature higher than 45° F are typically required. Application should generally be heaviest at edges of swcied areas and at crests of ridges and banks to prevent loss by wind. The remainder of the area should have binder applied uniformly. Binders may be applied after mulch is spread or sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is generally more effective.

TABLE 11.6
Mulch Application Rates

Mulch Type	Application Rate (Min.)			Notes
	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yd.	
Straw	3 tons	140 lb.	1,240 lb.	Either wheat or oat straw, free of weeds, not chopped or finely broken
Hay	3 tons	140 lb.	1,240 lb.	Timothy, mixed clover and timothy or other native forage grasses
Wood Chips	4 - 8 tons	185 - 275 lb.	1,650 - 2,500 lb.	May prevent germination of grasses and legumes
Hydromulch	1 ton	47 lb.	415	See limitations above

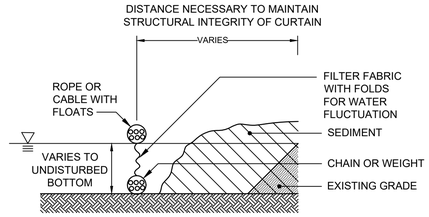
6/- DETAIL
STRAW MULCH
SCALE: NTS
XREF:



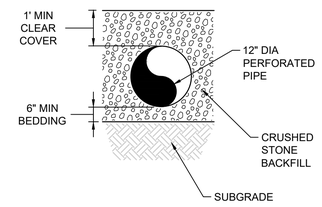
NOTES

1. FABRIC SHALL HAVE A MINIMUM PROPERTIES AS SHOWN IN TABLE (?) OF THE MASS DEP EROSION CONTROL MANUAL
2. FABRIC WIDTH SHALL BE 42" MINIMUM. STAKES SHALL BE EQUIVALENT STEEL (U OR T). SUPPORT STAKE SHALL BE DRIVEN 12" MINIMUM INTO UNDISTURBED GROUND.
3. SILT FENCE SHALL BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE FENCE SHALL EXTEND AT LEAST 8' UP SLOPE AT 45 DEGREES TO THE MAIN FENCE.

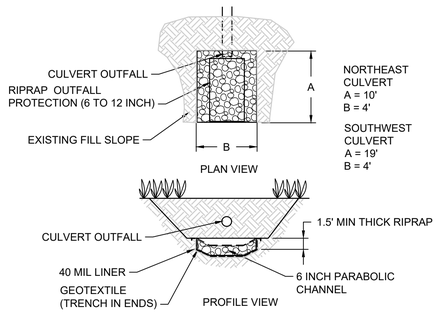
2/- DETAIL
REINFORCED SILT FENCE
SCALE: NTS
XREF:



4/8 DETAIL
TURBIDITY CURTAIN
SCALE: NTS
XREF:



7/4 DETAIL
PERFORATED DRAIN TRENCH
SCALE: NTS
XREF:



NOTE: TERMINATE RIPRAP OUTFALL PROTECTION ONTO ROUGH SURFACE BLOCK WALL.

5/4 DETAIL
RIPRAP OUTFALL
SCALE: NTS
XREF:

REV	DATE	DESCRIPTION	DRN	APP
I	01/2022	ACOE COMMENTS	RMK	DB JK
H	11/2021	AGENCY COMMENTS	RMK	DB JK
G	07/2021	AGENCY COMMENTS	RMK	DB JK
F	05/2021	REVISED MEAN LOW WATER LINE	RMK	DB
E	03/2021	AGENCY COMMENTS	RMK	DB
D	10/1/2020	PRELIMINARY AGENCY COMMENTS	RMK	DB
C	07/2020	ISSUED FOR PERMITTING	RMK	DB
B	01/2020	ADDRESS PRELIMINARY CLIENT AND AGENCY COMMENTS	RMK	DB
A	07/19/2019	30% DESIGN - CLIENT REVIEW	RMK	PT

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: DETAILS

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
8/27/2021
DATE

COMMONWEALTH OF MASSACHUSETTS
DANIEL H. BOURDEAU
CIVIL
No. 47558
REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: MN		DATE: JULY 2021	
DRAWN BY: RMK		PROJECT NO.: BR0494	
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REVIEWED BY: DB		DRAWING NO.:	
APPROVED BY: DB		10 OF 10	

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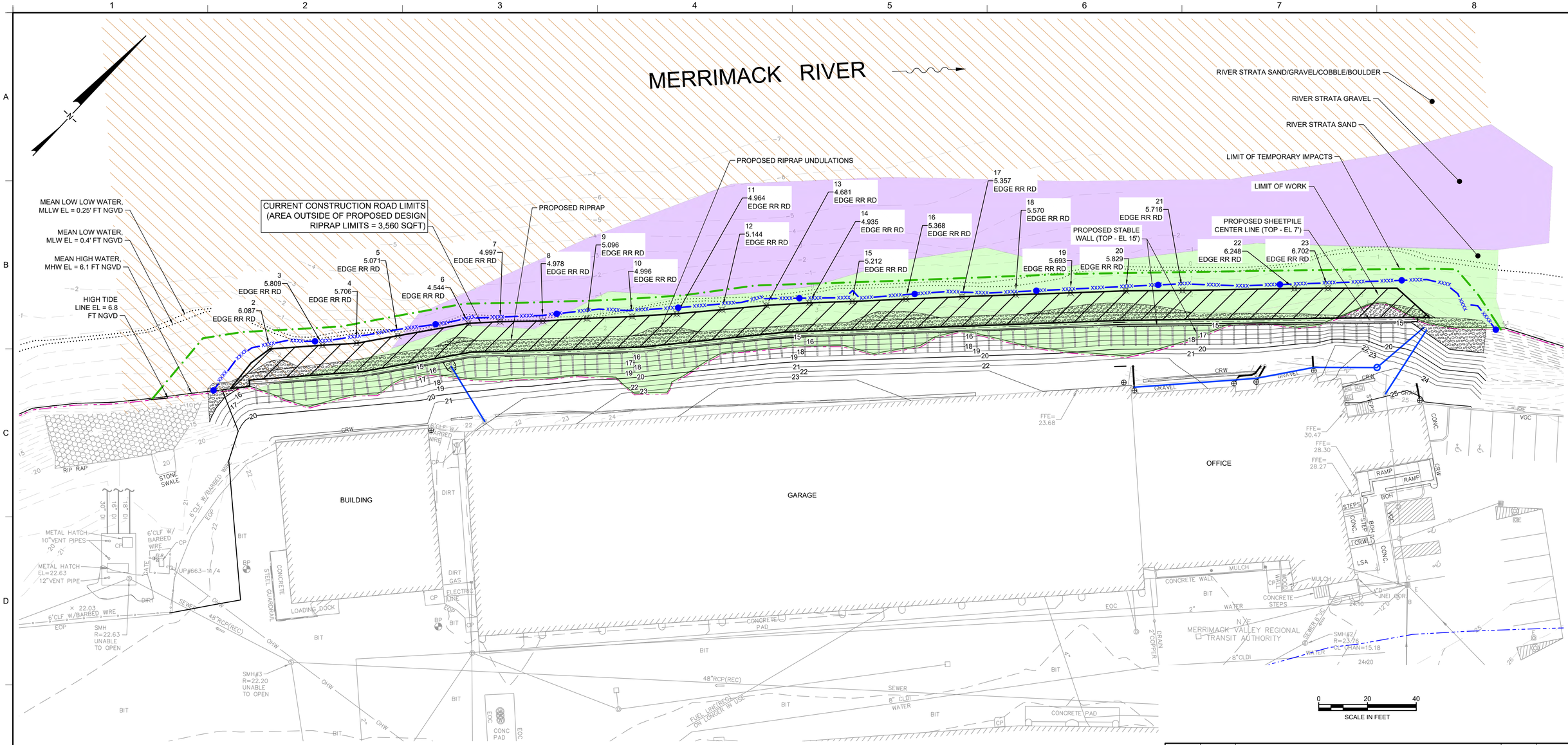
Attachment 2

RIPRAP CONSTRUCTION ROAD RIVER IMPACTS, dated December 2022, prepared by Geosyntec Consultants, sheet 1 of 1



LEGEND

- PROPOSED SHEET PILE
- PROPOSED GRADING CONTOURS (1 FT INTERVAL)
- PROPOSED RIPRAP
- CURRENT CONSTRUCTION ROAD LIMITS
- TURBIDITY CURTAIN
- TURBIDITY CURTAIN POINT
- EXISTING RIPRAP
- SAND AND GRAVEL SUBSTRATE
- SAND SUBSTRATE
- SAND/GRAVEL/COBBLE/BOLDER SUBSTRATE
- 15 / 5.212 / EDGE RR RD — SURVEY POINT (SEE NOTE 1)

NOTE:

1. FIELD SURVEY LOCATION OF LIMIT OF TEMPORARY RIPRAP ROAD COLLECTED BY ALPHA SURVEY AND PROVIDED TO GEOSYNTEC ON DECEMBER 1, 2022.

ISSUED FOR REVIEW

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants

MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY

TITLE: RIPRAP CONSTRUCTION ROAD RIVER IMPACTS

PROJECT: RIVERBANK STABILIZATION PROJECT MVRTA OPERATING FACILITY

SITE: 85 RAILROAD AVENUE, HAVERHILL, MASSACHUSETTS

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SIGNATURE

DATE

DESIGN BY: MN	DATE: DECEMBER 2022
DRAWN BY: BEG	PROJECT NO.: BR0494
CHECKED BY: MN	FILE:
REVIEWED BY: DB	DRAWING NO.: 1 OF 1
APPROVED BY: DB	

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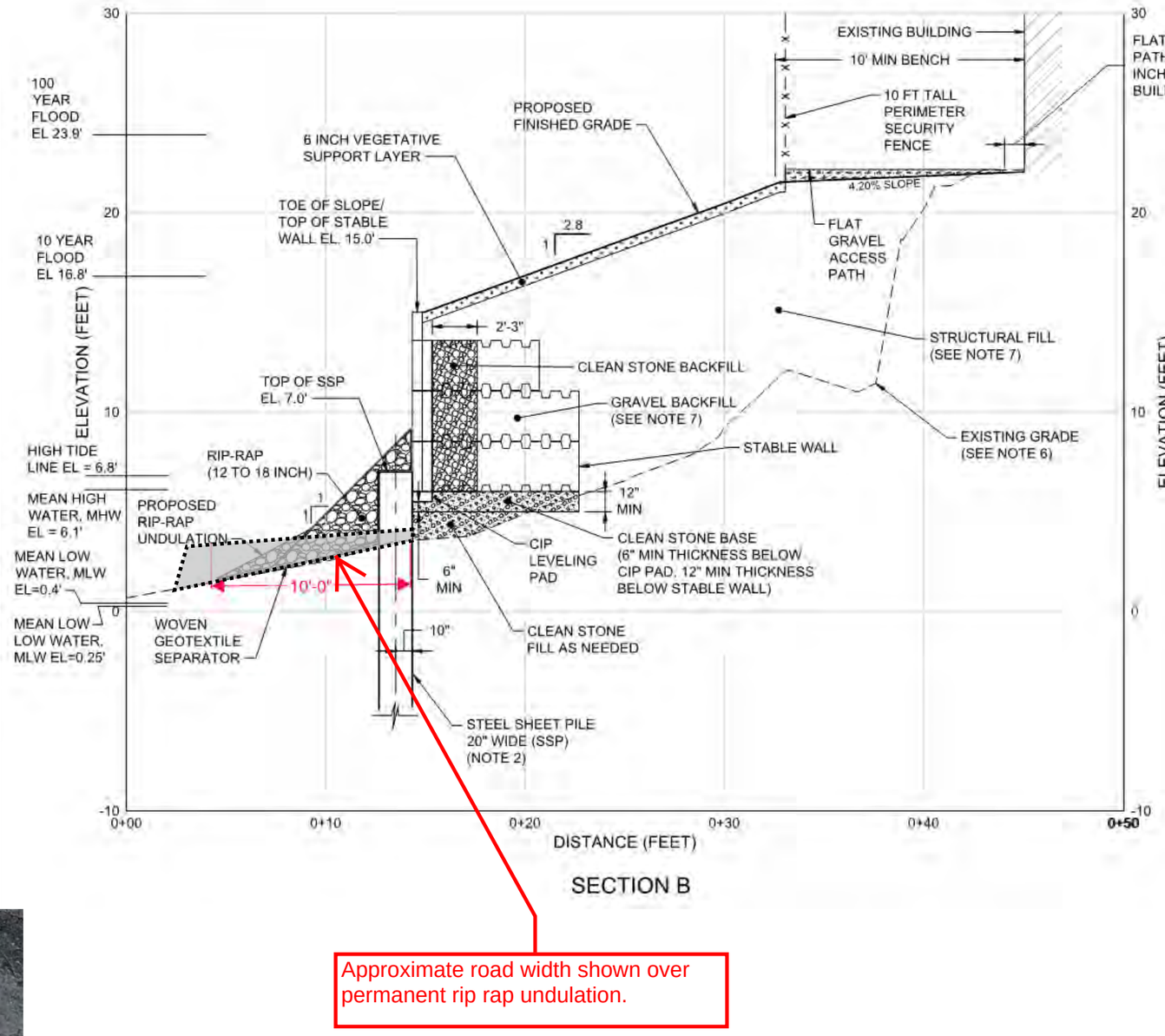
Attachment 3

Unpermitted Impacts, Photos and Cross-section. 3 sheets, prepared by Geosyntec Consultants.



SECTION B

Approximate road width shown over permanent rip rap undulation.

Existing bank material placed over riprap. Bank material was taken from existing bank material that was recovered from grubbing.
This was done so Site Truck tires and Excavator Tracks were not destroyed by rip rap. Thickness between 1-2 inches.


Once vegetation removed, some excess material from the grubbing was placed on the rip rap as discussed on previous slide.

Attachment 4

Shortnose and Atlantic Sturgeon Protection Plan (SPP) Merrimack Valley Regional Transit Authority (MVRTA) – Riverbank Stabilization Project Haverhill, Massachusetts June 2021 Prepared by Donald Pugh

Shortnose and Atlantic Sturgeon Protection Plan (SPP)
Merrimack Valley Regional Transit Authority (MVRTA) – Riverbank Stabilization Project
Haverhill, Massachusetts
June 2021

Prepared by Donald Pugh

Introduction and Proposed Project Action

The Merrimack Valley Regional Transit Authority (MVRTA) Riverbank Stabilization Project (Project) proposes to mitigate current erosion and stabilize a severely eroded portion of the MVRTA facility's riverbank along the southern bank of the Merrimack River in Haverhill, MA. The river at the Project area is tidally-influenced and approximately 450 feet wide, with a sand, mixed sand and gravel, and mixed sand/gravel/cobble/boulder bottom. There are no obstructions in the river in this area.

The proposed Project includes fill to replace a portion of the bank/slope soil that has been lost to erosion and ensure the structural integrity of the bus garage/administration and warehouse buildings. To minimize the lateral extent of fill placement, sheet pile installation is proposed for stability along the entire stretch of bank stabilization. Sheet pile will be installed at approximate distances of 13 to 25 feet landward from the Mean Low Water (MLW) line. The top of sheet pile will be flush with the proposed adjacent bank elevation. In addition, the proposed Project slope will approximate the historic footprint of the bank, as recorded on a topographical survey performed in 2009. No in-water work will occur during the sturgeon spawning, egg and yolk-sac period (April 1 to July 15).

The proposed Project includes the following:

- Sheet pile along the entire bank stabilization (480 LF) will be installed above the Mean Low Water (MLW) line using land-based equipment positioned on the Project's riverbank or upland areas. A vibratory hammer will be used to drive the piles.
- Riprap will be installed above MLW along the entire riverward face of the sheet pile (1:1 slope) – no sheet pile will be directly exposed to river water or visible. This riprap would extend laterally approximately 3 - 6' riverward from the sheet pile.
- In addition, approximately six riprap 'undulation areas' will be spaced along the toe of the slope and extend approximately seven feet riverward from the sheet pile.
- Above the sheet pile there will be a steep 3-foot layer of granite slabs or textured boulders, intersecting the Mean High Water (MHW) line and High Tide Line (HTL) near the bottom of this layer.
- Above the layer of granite slabs or textured boulders there will be a vegetated (structural fill) slope (approx. 1.7 : 1 or 1.8 : 1) with vegetation of an appropriate variety of native species found in the local area.
- At the top of the slope, there will be an 8' wide 'bench' of flat ground next to the building.
- No fill will be placed below the MLW line.

- Temporary turbidity curtain (with anchors to function as a sturgeon exclusion barrier) during construction is proposed approximately six feet riverward of the toe of the proposed riprap. The curtain will be installed above the MLW line. The sweep (or drag) zone of the turbidity curtain is anticipated to extend up to 12 feet laterally in either direction (per the Massachusetts Natural Heritage and Endangered Species Program (NHESP)).

Impact Analysis

Habitat Use

The reach of the river in the vicinity of the Project is a shortnose sturgeon spawning area (Kieffer & Kynard 1996). In addition, juvenile, sub-adult, adult shortnose, and sub-adult Atlantic sturgeon may be present in this reach of the river during the spring, summer or fall.

Shortnose sturgeon spawn in March and April between river kilometers 30 and 32. The Project is located at river kilometer 32. Shortnose sturgeon may use the immediate area of the Project during the summer for foraging, but the primary foraging area is the Amesbury reach downriver of Haverhill (Kieffer & Kynard 1993). Movement into the Project area may be from the lower river for spawning or later in the year for foraging, or by sturgeon moving downriver to forage or to move to winter habitat.

This Shortnose and Atlantic Sturgeon Protection Plan (SPP) has been prepared to address the Massachusetts Natural Heritage and Endangered Species Program (NHESP) requirements, as the project must be conditioned to avoid a "take" of Shortnose Sturgeon. Accordingly, this SPP will be followed for any work conducted below the High Tide Line (HTL) between March 15 and November 15.

Protective Measures

Sturgeon Exclusion and Noise Reduction

Prior to the start of construction, a turbidity curtain will be installed. The turbidity curtain, with anchors to secure the curtain to the substrate, will be positioned approximately six feet riverward of the toe of the proposed riprap, above the MLW. All construction will occur in the dry during low tide when the area inside the turbidity curtain will be dewatered.

The curtain will remain in place during installation of the sheet pile, riprap, and all other materials used for bank stabilization. Prior to the complete installation of the curtain, the area behind the curtain will be swept for sturgeon.

Although not anticipated for the Project, it is noted that, if vibratory hammering were to take place when the curtain is not dewatered, the curtain would reduce to a limited degree sound created by installation of the sheet piles. The curtain will reduce sound created during the work as it creates an acoustical barrier reducing, to a limited degree, sound transmission and, therefore, noise levels.

Sturgeon can be negatively affected by sound. Criteria developed by the Fisheries Hydroacoustic Working Group in 2008 for the protection of all fish, including green sturgeon, are:

Injury – 206 dB re 1 µPa Peak
Injury – 187 dB cSEL (Cumulative sound exposure - dB re 1µPa2-s)
Behavioral Modification – 150 dB re 1 µPa RMS (root-mean-square)

In the Biological Opinion for in-water work at the Holyoke Dam on the Connecticut River (NMFS 2015), the National Marine Fisheries Service (NMFS) used the above criteria to assess the potential for injury or behavioral modification.

With the curtain in place and the piles being driven in the dry, the installation of sheet piles by vibratory hammer at the Project is expected to produce acoustic footprints less than driving sheet piles (163 dB re 1 µPa2-s SEL cum at a distance of 16 ft), the level noted in the 2015 Holyoke Hydroelectric Biological Opinion. This level is below that of injury and the effect upon a sturgeon would be that it would move away from the sound source.

Sound levels while setting sheet pile cofferdams during construction in 2016 of combined sewer outfalls in Springfield, MA did not exceed injury level. These levels were measured with use of a single turbidity curtain and an unconfined bubble curtain outside of the turbidity curtain. Sheet piles at this Project will be driven without water as an interface between the sound source and the river, eliminating a primary vector of transmission.

It is anticipated that sound levels beyond the turbidity curtain will be below the level causing injury and possibly below those of behavioral modification. The turbidity curtain will remain in place during all stabilization work. Should sound levels in the area of the river outside the curtain exceed behavioral modification, there is a significant width of the river where sound levels will be below that level, allowing for both foraging and movement up- and downriver beyond any acoustic disturbance.

The NMFS concluded in the Holyoke Biological Opinion (NMFS 2015) that any sound level generated by pile driving that exceeded 150 dB re 1 µPa RMS 1) would cause a sturgeon within that area to move away from the sound, 2) that the energy needed to move was minimal, and 3) that the effect on a sturgeon was insignificant. They further stated, considering the protection in place (single silt curtain) and the time needed to drive the two-foot piles, that the effect of installation of the piles would "… be insignificant and discountable."

During initial sheet pile installation, noise levels in the river will be monitored. A sturgeon biologist will be present during the acoustic monitoring to ensure that sound levels do not exceed immediate injury level. Levels will be monitored at two locations approximately 10 meters from the water's edge: perpendicular to the sound source and 45 degrees downriver. Hydrophones will be placed at mid-water depth. Should levels exceed instantaneous injury levels, work will cease and additional sound protection will be installed. After this installation, sound levels will again be monitored to ensure reduction below injury levels. Given that the work will be done during low tide, in the dry, and with a turbidity curtain in place, any sound generated is unlikely to exceed even behavioral modification levels outside of the curtain. Once sound levels have been established to be below injury level, sound monitoring will end. If

any different method of sheet pile installation is undertaken after the initial sound monitoring, sound monitoring will be repeated. A monitoring report will be prepared.

Sturgeon Sweep

A sweep of the enclosed area will be done to ensure no sturgeon are behind the turbidity curtain. The turbidity curtain will remain open at one end during the sweep. During the sweep, a sturgeon biologist will be present to confirm that the sweep is completed satisfactorily and that there are no sturgeons in the area to be encircled by the turbidity curtain. Immediately after the sweep, the turbidity curtain will completely enclose the work area. During the sweep, the curtain will be monitored to ensure it is secured to the river bottom.

Should the turbidity curtain need to be redeployed, or should the curtain become lifted from the bottom of the river, work will cease and a sturgeon sweep will be done after the curtain is secured to the bottom to ensure no sturgeon are behind the curtain before work can resume.

After the curtain is closed, should a sturgeon be present within the area behind the turbidity curtain all work will stop, and should there be water behind the curtain, it will be opened at one end. The area behind the turbidity curtain will be swept to ensure that the sturgeon has left the area. If a sturgeon is found within the turbidity curtain, the NMFS and NHESP will be advised of the situation.

Should a dead or injured sturgeon be found, the NMFS and NHESP will be notified along with Micah Kieffer of the USGS S.O. Conte Anadromous Fish Research Center. The Conte lab holds a Section 10 permit for sturgeon in Massachusetts. Personnel from the Conte lab will record physical information (length, weight and condition), as well as assessing if individual identification (PIT tag) is present. Conte personnel will take control of the fish. A report will be filed with the NMFS and NHESP.

Time-of-Year Restrictions

All in-water activity will occur outside of sturgeon spawning season (April 1 to July 15). Once the turbidity curtain is installed, no sturgeon will be impacted by the bank stabilization work. Due to the limited likelihood of interaction, and the protections described to ensure that sturgeon are not harmed, and that movement will not be restricted, it is recommended that the full time-of-year (TOY) restrictions (March 1 to November 15) should not apply to the Project, as described in the Massachusetts Division of Marine Fisheries' (DMF) Technical Report TR-47, "Recommended Time of Year Restrictions (TOYs) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts".

It is anticipated that the Project will have no or an insignificant impact on sturgeon spawning, feeding, over wintering, or movement. It is not anticipated that a sturgeon will be trapped inside the turbidity curtain but, if one is so trapped, the protective measures listed above will prevent injury or mortality.

References

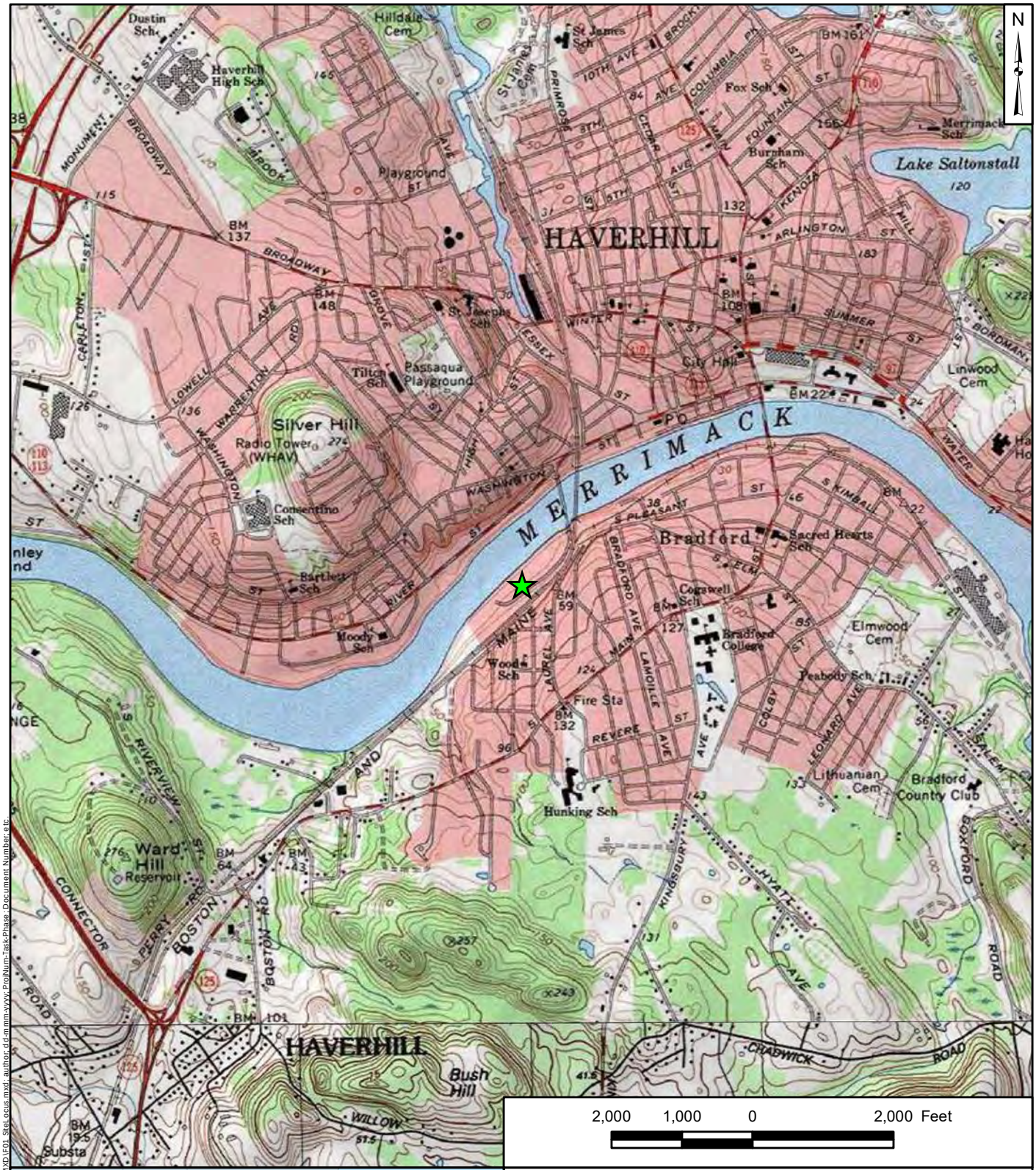
Kieffer, M.C., and B. Kynard. 1993. Annual Movements of shortnose and Atlantic sturgeons in the Merrimack River, Massachusetts. Trans. Am. Fish. Soc. 122:1088-1103.

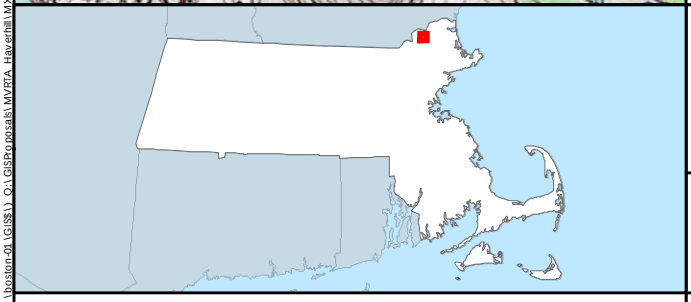
Kieffer, M. and B. Kynard. 1996. Spawning of Shortnose Sturgeon in the Merrimack River, Massachusetts. Trans. Am. Fish. Soc. 122: 1088-1103.

National Marine Fisheries Service (NMFS). 2015. Endangered Species Act, Section 7 Consultation, Biological Opinion, Holyoke Hydroelectric Project (FERC #2004).

Attachment 5

Site Locus Map, prepared by Geosyntec Consultants, MA Environmental Policy Act, 2023 Notice of Project Change, Figure 1





Site Locus Map

Merrimack Valley Regional Transit Authority (MVRTA)
85 Railroad Avenue
Haverhill, Massachusetts

Geosyntec consultants

Acton, MA | March 2021

Figure 1

(O:\ = \\boston-01\GIS$\) O:\GIS\Proposals\MVRTA Haverhill\MXD\F01_SiteLocus.mxd: author; dd-mm-yyyy; ProjNum-Task-Phase; Document Number; etc

Attachment 6

September 29, 2021 Division Determination.

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

Jack Buckley, *Director*

September 29, 2021

Noah Berger
Merrimack Valley Regional Transit Authority
85 Railroad Avenue
Haverhill, MA 01835

Haverhill Conservation Commission
4 Summer Street, #210
Haverhill, MA 01835

RE: Applicant: Merrimack Valley Regional Transit Authority (MVRTA)
Project Location: 85 Railroad Avenue, south bank of the Merrimack River
Project Description: Stabilize bank adjacent to MVRTA facility (the Project)
DEP Wetlands File No: 033-1510
NHESP Tracking No.: 09-26941
Documents Referenced:

- NOTICE OF INTENT and STREAMLINED MESA/WPA REVIEW MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY (MVRTA), COVER LETTER DATED 8/27/2021. Prepared by Geosyntec Consultants.
- BIOLOGICAL ASSESSMENT FOR SHORTNOSE STURGEON AND ATLANTIC STURGEONS AT THE MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY (MVRTA) RIVERBANK STABILIZATION PROJECT. June 2021. Prepared in compliance with Section 7 of the federal Endangered Species Act (attached).
- Plan of Record: "Riverbank Stabilization Project MVRTA Operating Facility 85 Railroad Avenue Haverhill, Massachusetts. July 2021. Prepared for the MVRTA by GeoSyntec Consultants. Sheets Cover, 1-10, inclusive.

Dear Applicants & Commissioners:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received a Notice of Intent with Plans (noted above) in compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.58(4)(b) and 10.59). The Division also received the MESA Review Checklist and supporting documentation for review pursuant to the MA Endangered Species Act Regulations (321 CMR 10.18).

The Project site is mapped as *Priority* and *Estimated Habitat* for the following state-listed species:

Scientific name	Common Name	Taxonomic Group	State Status
Acipenser oxyrinchus	Atlantic Sturgeon	Fish	Endangered*
Acipenser brevirostrum	Shortnose Sturgeon	Fish	Endangered*

The species listed above are protected pursuant to the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). *The Atlantic and Shortnose Sturgeons are federally listed and protected pursuant to the U.S. Endangered Species Act (ESA, 50 CFR 17.11) implemented by the National Oceanic and Atmospheric Administration's National Marine

Fisheries Service (NMFS). Fact Sheets for most state-listed species can be found on our website (www.mass.gov/nhesp).

The Project is located along the southern bank of the tidally influenced Merrimack River. The river at the Project is a mixture of sand, sand & gravel and a mixed sand/gravel/cobble/boulder bottom. T he Project proposes to stabilize a 430-foot-long segment of the Merrimack Riverbank (the "Work") and will impact 1,409 square feet of Land Under Water (temporary). The bank is eroded and has visible scour, slumping and related damage. The MVRTA structure has an outer wall that is located within 25 feet of the most eroded section of the Bank. Laydown areas will be largely installed in upland (mostly paved) areas of the site, with a small upland temporary construction access path to be installed on the east side of the bus facility from the laydown area to the construction area. Sturgeon lifestages from young of year to adults may be present in the River throughout the year.

Based on the information provided and the information contained in our database, the Division finds that this project, as currently proposed, **must be conditioned in order to avoid adverse effects to the actual Resource Area Habitat** of state-protected rare wildlife species and **in order to avoid a prohibited Take of state-listed species (321 CMR 10.18(2)(a))**.

1) **Plans of Record**. All work must conform to the Plans of Record and as amended and approved by the Division. Any changes, updates, or revisions to the proposed Project or any additional work beyond that shown on the Plans of Record shall require additional review and approval by the Division prior to implementation.

2) **Biological Assessment & Sturgeon Protection Plan**. The Project must be conducted in accordance with the Biological Assessment (attached, the "BA") and concurrence letter issued by NMFS. All requirements and conditions incorporated into the BA and responding NMFS concurrence letter are authorized and required by the Division. Mitigation measures in the BA are summarized in section 5.5. These same measures are summarized, and some additional conditions added herein.

    A. Sturgeon Protection Plan (SPP). The Project will implement a Shortnose and Atlantic Sturgeon Protection Plan (BA, Appendix E).
        i. A qualified biologist will monitor noise levels in the river prior to and during pile driving to ensure sound levels do not exceed instantaneous injury levels. If noise levels were to exceed instantaneous injury level (206 dB peak), all work must stop and additional sound/pressure mitigation measures installed. Then, sound levels will continue to be monitored until such time as the mitigation measures are sufficient to keep all sound below the instantaneous injury threshold (e.g., bubble curtains or additional turbidity curtains).
        ii. A turbidity curtain will be installed to enclose the in-river work area (i.e., below the High Tide Line to contain suspended materials from entering the river.
        iii. All sturgeon sweeps must be conducted by a qualified biologist approved by the Division. The initial sweep will be as the curtain is installed to ensure no sturgeon are behind or within the curtain before it is completely enclosed. If a sturgeon is behind the curtain, the curtain will be lifted such that the sturgeon can swim away. Any observed sturgeon will be reported to the NMFS Protected Species Division and NHESP.

    B. Required Revisions to the SPP. The Project shall submit an update/revision to the Protection Plan addressing the following, unless otherwise allowed by the Division.
        i. The curtains must be inspected daily to ensure their integrity.
        ii. The curtains must be inspected at a tidally-informed schedule to be certain that the bottom of the curtain is not lifting off the bottom during higher tides or faster water.
        iii. The curtain must be inspected each day of work and at any time high flows are experienced

to ensure it is not overtopped.

iv. If, at any time, lifting of the curtain bottom or overtopping is observed or reported to the project team, all work shall cease until such time as the qualified biologist completes a sweep of the areas within the curtain.

3) **Erosion & Sedimentation Control**: Prior to the start of Work, adequate erosion and sedimentation control measures shall be implemented, including any necessary controls not specifically referenced in the Plan, and be maintained in effect throughout Project construction and until the site has become stabilized. Structural failure of erosion and sedimentation controls may be subject to enforcement action pursuant to the MESA. If any additional measures are proposed to be installed below the high tide line, consultation with the Division is required.

4) **Plantings and Seeds.** Any plantings or seeds located outside of areas to be maintained as lawn, shall be native to the County in accordance to 'The Vascular Plants of Massachusetts: A County Checklist First Revision' (Dow Cullina, M., B. Connolly, B. Sorrie, and P. Somers. 2011. MA NHESP DFW). Available from State Library of Massachusetts at http://archives.lib.state.ma.us {search for the name of the publication noted herein}.

5) **Compliance Report**: Within thirty (30) days of completion of work the Applicant shall submit a brief written report including photographs showing previous and final conditions with emphasize on demonstrating compliance with Conditions herein and that of the BA.

6) **Renewal, extension or Amendment of the Order of Conditions, Request for Certificate of Compliance**: Upon filing for any renewal, extension, amendment, certification of compliance to any Orders of Conditions issued associated with this site pursuant to the MA Wetlands Protection Act, the Applicant shall similarly file with the Division.

Provided the above-noted condition is fully implemented and there are no changes to the project plans, this project will not result in adverse effects to the actual Resource Area Habitats of state-protected rare wildlife species and will not result in a Take of state-listed species. We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project. Upon filing for any renewal, extension, or amendment of the Orders of Conditions issued under the MA Wetlands Protection Act, the Applicant shall contact the Division to determine if re-filing under MESA is required.

Please contact Misty-Anne R. Marold, Senior Endangered Species Review Biologist, at (508) 389-6356 (misty-anne.marold@mass.gov) with any questions or comments relative to this determination.

Sincerely,

Everose Schluter

Everose Schluter, Ph.D.
Assistant Director

Attached: BIOLOGICAL ASSESSMENT FOR SHORTNOSE STURGEON AND ATLANTIC STURGEONS AT THE MERRIMACK VALLEY REGIONAL TRANSIT AUTHORITY (MVRTA) RIVERBANK STABILIZATION PROJECT.

cc: Patricia Huckery, MA DFW Northeast District Supervisor
Alicia Geilen, Wetlands Circuit Rider for the Northeast Regional Office
Paul Sneeringer, U.S. Army Corps of Engineers
Roosevelt Mesa, NOAA-NMFS
Daniel Bourdeau, Geosyntec Consultants, Inc.