Attachment M6 – Selected CTDOT Specifications

ITEM #0948013A – TIDAL WETLAND CREATION

Description: The work under this item shall consist of the construction of a tidal creation area, tidal restoration area, tidal enhancement area ("mitigation area"), turtle nesting habitat area or living shoreline area at the Site(s) identified on the Tidal Wetland Mitigation Plans. The work generally consists of excavating, backfilling, furnishing material and preparing appropriate Site grades under the direction of an Environmental Scientist from the Connecticut Department of Transportation's Office of Environmental Planning (OEP).

Materials: Planting Soil shall be native or manmade planting soil. Planting soil shall consist of soils containing *no more than* 25% sand by weight and an organic content between 25% and 40% by weight. The Contractor shall test all planting soil and a certified test report shall be submitted to OEP for review and acceptance.

Planting soil not furnished by the Contractor shall be native soil material from areas free of invasive species stripped from permitted earth excavation areas within the Project limits. The stripped soil shall meet the criteria specified above and Certified Material Test results shall be approved by the OEP. If these soils do not meet the criteria, additional material from off-Site areas may be substituted or mixed with the on-Site material provided the resultant soil composition meets the applicable criteria.

The soils must be analyzed by USDA-approved methodology for organic matter by loss-on-ignition of oven-dried samples dried at 221°F. The mineral fraction must be analyzed to determine weight percentage of sand, as determined after passing a No. 10 sieve. Sand particles are defined to be between No. 35 and No. 10 sieve. Certified Materials Test results are to be submitted to OEP for approval. The soils must be free of seeds and roots of invasive species, inspected, and approved by OEP prior to their application.

If soil must be supplemented with organic material, the following sources are acceptable, but must meet the criteria for planting soil specified above:

a) **Native Wetland Soil**: The top layer of native wetland soil shall be excavated from within the Project limits or from another permitted wetland source approved by OEP. The bottom of this layer shall be defined as the depth at which the soil color and texture changes, indicating the beginning of the subsoil. Each source must be inspected in place at least 6 months prior to excavation for determination by OEP that it is free from seeds and roots of invasive species.

b) **Peat** shall meet the requirements of **Subarticle M.13.07–Plant Materials: 13. Peat.** Peat material excavated from the Project Site shall be substituted for commercially packaged peat, at the discretion of the Engineer if the on-Site peat does not meet all the requirements of M.13.07.

Backfill used in the tidal wetland mitigation area shall be native or manmade material. Backfill shall consist of soils meeting the textural classification of silt loam with at least 50% silt and the

clay percentage less than 25%. The Contractor shall test the soil by USDA-approved methodology. A Certified Materials Test Report shall contain analysis of the mineral fraction to determine the particle gradation to meet the silt loam textural requirement. The Certified Materials Test Report shall be submitted to OEP for acceptance. The soils must be free of seeds and roots of invasive species and shall be inspected and approved by OEP prior to use and application.

Turtle Nesting Beach Sand shall be natural or manufactured sand consisting of clean, hard, durable, uncoated particles of quartz, other rock or marine shell fragments. It shall be free from lumps of clay, soft or flaky material, mica, loam, organic or other injurious material and shall be analyzed according to AASHTO T 21 to meet the following Site specific gradation:

Sieve Size	Percent Passing
1/2"	100
3/8"	97 – 100
No. 4	93 – 100
No. 8	86 – 97
No. 16	70 – 95
No. 30	25 – 88
No. 50	5 – 55
No. 100	0 – 10
No. 200	0 – 2

Turtle nesting beach sand shall meet the requirements of the colorimetric test and shall not produce a color darker than Gardner Color Standard No. 11. A certified materials test report shall be submitted by the Contractor to the Engineer for OEP acceptance.

a) **Soundness:** When tested with magnesium sulfate solution for soundness according to AASHTO T 104, no more than 10% of the fine aggregates shall be lost at the end of 5 cycles. Turtle nesting beach sand that fails to meet this requirement, but meets all other requirements, may be allowed for use on a restricted basis with the approval of the Engineer on a case-by-case basis.

b) **Storage:** Aggregate stockpiles shall be located on smooth, hard, sloped/well drained areas. Each source and gradation shall have an individual stockpile or bin. Aggregates shall be handled from stockpiles or other sources in such manner as to minimize segregation of the material. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

c) **Granular Fill:** Turtle nesting beach sand shall be placed on a 6-inch layer of granular fill. Granular fill shall meet the requirements of **Subarticle M.02.01–Granular Fill.**

Living Shoreline shall consist of riprap and granular fill.

a) **Riprap:** The riprap size shall be as noted on the plans and shall be resistant to action of air and water. Riprap shall meet the requirements of **Subarticle M.12.02–Riprap**.

   Riprap material proposed by the Contractor must be inspected and approved by the OEP or their authorized delegate prior to the excavation of existing on-Site material within the Project limits or hauling of material from an off-Site source. The Contractor shall give the Engineer at least 10 working days' notice for scheduling of the inspection and approval of the riprap.

b) **Granular Fill:** Granular fill shall be placed as shown on the plans. Granular fill shall meet the requirements of **Subarticle M.02.01–Granular Fill.**

Oyster Cultch: The Contractor shall submit to the Engineer the oyster cultch source supplier for approval through OEP and the Norwalk Shellfish Commission. Once source supplier is approved, a 5-gallon bucket sized sample shall be submitted for review by the Department of Agriculture, Bureau of Aquaculture prior to placement within the tidal mitigation areas. If the cultch source supplier is from Connecticut, no air-drying is required. If the cultch source supplier is from outside of Connecticut, the Contractor shall provide certified documentation that the cultch has been air dried for six months.

Construction Methods: An Environmental Scientist from the OEP will be on-Site to oversee and monitor construction of the tidal wetland mitigation area(s) to ensure compliance with the Tidal Wetland Mitigation Plans.

The Contractor shall submit a construction schedule and an outline of construction methodologies (called the Contractor's Mitigation Plan) for the required earthwork of the tidal wetland creation Site according to the general construction sequence and requirements outlined below to OEP for approval. No work associated with the tidal wetland mitigation area(s), living shoreline, invasive treatment areas, or turtle nesting habitat area(s) shall commence until the OEP has reviewed the submittal and approval is granted. OEP shall have 30 days from the date the submission is received from District Construction to review and approve the submission.

The Contractor must schedule tidal creation activities to begin as soon as access allows. There shall be no inactive period of longer than 10 days between the beginning of the excavation of the mitigation Site and the time when final grades are reached. When applicable, and when conditions warrant, excavation and final grading shall be completed during and near times of low tide unless the work area is contained and isolated from tidal action. The excavation, furnishing of material, final grading, seeding and planting shall be scheduled so that planting will occur within the planting season according to Item #0949875A – Wetland Plantings.

Upon completion of final grades, the Site shall be exposed to tidal flushing for a minimum of 7 days and a maximum of 14 days to allow for settlement of the planting soil and to evaluate final grades. During the 7-14 day settling period, the HTL will be flagged in the field by the Environmental Scientist from OEP or their designated representative. At the end of the first 7

days, the Site conditions will be evaluated by an Environmental Scientist from OEP. Adjustments to final grades or additional placement of planting soil may be made at this time. Planting of rootstock shall immediately follow.

The Contractor shall provide a construction schedule to the Engineer and OEP prior to beginning any construction activities. No work shall commence without OEP concurrence. The Contractor shall ensure that the Environmental Scientist from OEP is available at least 10 days prior to the commencement of these activities to ensure that the Environmental Scientist is available.

OEP reserves the option to adjust the mitigation Site final Grading and Planting Plans to ensure mitigation Site success. During planting, the OEP Environmental Scientist, or their designated representative may relocate up to 50% of the plants in each community type if as-built conditions would pose an unreasonable threat to the survival of plantings installed according to the Planting Plan. The plantings shall be relocated within the tidal wetland creation area to locations with suitable hydrology and soils and where appropriate structural context with other plantings can be maintained.

Upon approval of the Contractor's Mitigation Plan submittal, the Contractor shall meet with the OEP Environmental Scientist in the field prior to on-Site mobilization for the following work at the various mitigation areas:

Mitigation Area 1, Mitigation Area 3 and Mitigation 6B

(a) Remove nuisance vegetation and all invasive plant species in accordance with Contract Item #0952051A – Control and Removal of Invasive Vegetation to the limits shown on the plans.

(b) Install tidal creation signs as directed by OEP.

Mitigation Area 2, Mitigation Area 6 and Mitigation 6A (except as noted)

(a) Identify proposed temporary stockpile and staging locations.

(b) Verify and delineate established Limit of Disturbance as shown on the plans. Prior to excavation or placing of planting soil, backfill, living shoreline or turtle nesting beach sand, the Contractor shall set reference stakes for Site-specific tidal data at the mitigation Site in order to establish appropriate elevations for final grading as directed by OEP staff.

1. Obtain (survey) elevation of existing tidal vegetation and stake in field as directed by OEP.
2. Stake CJL, HTL, MHW, MLW and other jurisdictional limits as may be required by the Project permit.

(c) Install temporary sedimentation and erosion control measures.

(d) Remove nuisance vegetation and all invasive plant species in accordance with Contract Item #0952051A – Control and Removal of Invasive Vegetation.

(e) Identify, clear, grade, and construct any required haul road(s) for access if necessary. Construct haul roads in a manner that minimizes disturbance to existing native vegetation. No additional impacts shall occur to the existing tidal wetland vegetation other than the impacts depicted on the plans. Access haul roads are to be maintained throughout the duration of the Project and haul road locations restored back to their original condition or as depicted on the plans.

(f) **Mitigation Area 2.** Where phragmites are present within the mitigation Site, over excavate to a minimum depth of 3 feet or to a sufficient depth below existing grade for the removal of all rhizomes or as directed by an Environmental Scientist from OEP.

(g) **Mitigation Area 6 and Mitigation Area 6A.** Remove the surface layer of existing riprap. Riprap removed shall be used to create the Living Shoreline. Existing riprap below the surface shall be over excavated to sufficient depth as directed by the Environmental Scientist from OEP. Existing on-Site riprap proposed to be used to create the Living Shoreline shall meet the percentage criteria as defined in the Contract plans. If there is an insufficient quantity of suitable material on-Site to create the Living Shoreline, the Contractor shall procure riprap of similar size to complete the Living Shoreline.

(h) Where over-excavation has occurred in the mitigation site areas, backfill material, as specified above, shall be placed to meet the proposed subgrade and compacted to the depth specified in the plans or as directed by an Environmental Scientist from OEP.

(i) A minimum of 14 inches of tested and approved planting soil shall be placed and compacted over the approved subgrade up to the final grade as shown on the Plan or as directed by an Environmental Scientist from OEP.

(j) **Mitigation Area 2.** Living shoreline, as specified under Materials, shall be placed within the mitigation Site to meet the proposed grade as required.

(k) **Mitigation Area 2.** Excavate turtle nesting habitat area to a minimum depth of at least 3 feet below proposed finished grade or as directed by the Environmental Scientist from OEP. Where phragmites rhizomes are present, over excavation shall be to a sufficient depth to remove all roots within the nesting turtle habitat area as directed by OEP. Granular fill, as specified above shall be placed in over excavated turtle nesting beach sand area on top of the proposed subgrade as required.

(l) **Mitigation Area 2.** Place tested and approved turtle nesting beach sand material on top of approved granular fill to the final grades shown on the Plan and in a manner consistent with specification of the Plan and as directed by an Environmental Scientist from OEP. Material shall be placed in a manner to avoid compaction.

(m) Oyster Cultch, as specified under Materials, shall be placed along the outer perimeter of the mitigation Site to meet the proposed grade as required.

(n) If wood debris, rubbish, or other bulky debris is encountered during over excavation of a mitigation Site or turtle nesting habitat area, the materials shall be removed and backfill placed in the resulting excavation to meet the proposed and approved subgrade. Materials shall be removed from the tidal mitigation areas and transported to an approved upland facility. Disposal of such materials will be paid for under Contract Item #0101135A – Disposal of Debris.

(o) Following placement of planting soil, re-establish Site-specific tidal data (CJL, HTL, MHW, MLW) at the mitigation Site and stake in the field in order to establish appropriate elevations for tidal wetland plantings.

(p) Prior to seeding, the seed tag shall be supplied to OEP for review and approval. Substitutions must be approved by OEP. Initiate and complete seeding consistent with specification of the Mitigation Plan.

(q) Upon placement of planting soil and approval of the Site by OEP, the Site shall be exposed to tidal flux for a minimum of 7 days and a maximum of 14 days. At 7 days, OEP will inspect the Site and adjustments to final grade or planting soil depths may be made. An additional 7 days of exposure to tidal fluctuation may be recommended by OEP at this time and further adjustments to grade may be made.

(r) OEP will inspect the mitigation Site at the conclusion of the 14 day tidal exposure. OEP will approve the Site prior to planting.

(s) **Mitigation Area 2.** Place coir rolls as shown on the plans or as directed by the Environmental Scientist from OEP.

(t) Following 14 days of exposure to tidal cycles, planting of rootstock shall commence in accordance with the Plans. During the performance of this work, an Environmental Scientist from OEP will be available to visit the Site to direct the planting within the wetland mitigation Site(s). The Contractor shall notify the Engineer at least 10 days prior to the commencement of these activities to ensure that the Environmental Scientist is available. Any proposed plant substitutions must be approved in advance by OEP.

(u) Upon stabilization of all Sites, remove temporary sedimentation and erosion control measures. Temporary devices and structures to control erosion and sedimentation in and around the tidal wetland mitigation area and turtle nesting habitat area shall be disassembled and properly disposed of. Sediment collected by these devices shall be removed and placed upland in a manner that prevents its erosion and transport to a waterway or wetland, in accordance with the Required Best Management Practices in Article 1.10.03.

(v) Restore stockpile and staging Site(s) and access/haul roads to the mitigation Site to their original condition or as depicted in the Tidal Mitigation Plan.

(w) Upon Site completion, clear the mitigation Site of any debris, rubbish, garbage, and other manmade litter.

(x) Provide certified post construction as-built plans of the mitigation Sites to OEP as defined by the Army Corps of Engineers and/or DEEP Land and Water Resources Division (LWRD) permit requirements.

(y) Install tidal creation signs as directed by OEP.

Mitigation Area 4 and Mitigation Area 5

(a) Remove nuisance vegetation and all invasive plant species in accordance with Contract Item #0952051A – Control and Removal of Invasive Vegetation and as shown in the plans.

(b) Planting, as directed by OEP, shall be done in the final year of bridge construction.

(c) Install tidal creation signs as directed by OEP.

Method of Measurement: Tidal Wetland Creation will be measured for payment by the number of square feet of Tidal Wetland Mitigation Area re-graded, covered with planting soil backfilled and accepted.

Basis of Payment: This work will be paid for at the Contract unit price per square foot for "Tidal Wetland Creation" within the tidal wetland mitigation area(s), living shoreline and turtle nesting habitat area(s), complete in place, including all materials, equipment, maintenance, tools, labor, and work incidental thereto.

The unit price shall also include: survey and staking of reference elevations and work associated with maintaining the field stakes for the duration of construction to the point of acceptance of the Site by OEP; forming subgrade within the tidal wetland mitigation areas, living shoreline or turtle nesting habitat areas; testing, mixing, and providing backfill, granular fill, riprap and planting soil; placing backfill and granular fill, placing turtle nesting beach sand, furnishing and placing oyster cultch and planting soil; restoring stockpile and staging Site(s); removing and disposing of debris, garbage and litter; and forming subgrade and planting soil within the wetland mitigation areas or turtle nesting habitat areas. The installation, maintenance, and removal/restoration of haul roads shall also be included in this item.

The cost of installing and removing sedimentation and erosion controls, including sedimentation control systems, anti-tracking pad and coir/fiber rolls shall be paid for under their respective Contract items.

The cost of all excavation shall be paid under the Section 2.02, for Earth Excavation.

The cost of all plantings shall be paid under Contract Item #0949875A – Wetland Plantings.

The cost of all seeding shall be paid for under their respective Contract items as shown in the plan.

The cost of disposal of wood debris, rubbish, or other bulky debris encountered during excavation of the Site shall be paid for under Contract Item #0101135A – Disposal of Debris.

The cost of installing wetland creation signs (31-5478) shall be paid for under Contract Item #1208931A – Sign Face – Sheet Aluminum (Type IX Retroreflective Sheeting).

The cost of removing invasive species shall be paid for under the Contract Item #0952051A - Control and Removal of Invasive Vegetation.

Pay Item	Pay Unit
Tidal Wetland Creation	s.f.

ITEM # 0210306A - TURBIDITY CONTROL CURTAINS

Description: This work consists of furnishing, constructing, installing, maintaining, and removing a turbidity control curtain from the Norwalk River to minimize the drift of suspended sediment in the river. The layout of the turbidity control curtains shall be as indicated on the Contract plans, permits or as directed by the Environmental Scientist from the Office of Environmental Planning (OEP).

Materials: The Contractor shall use Type III (Type 3) Impermeable Turbidity Barriers when working within tidally influenced waters.

Length: The length of the turbidity control curtain shall be as specified in the Contact plans, permit or as directed by the Environmental Scientist.

Fabric: The turbidity control curtains fabric shall consist of 22 oz./yd^2 Nylon reinforced Vinyl Fabric (PVC), with UV inhibitors. The material shall have a tensile strength of not less than 200 lbs. when measured lengthwise or crosswise.

Skirt Depth: The depth of the skirt shall be measured to maintain a 1-foot offset off the river bottom at all locations during high tide.

Color: The color of the turbidity control curtain shall be yellow.

Seams: All horizontal seams shall be 100% heat welded and all vertical seams shall be 100% RF welded.

Flotation Units: The flotation unit shall be a 12" polystyrene float with a buoyancy of 50 lbs./ft^2 capable to keep the turbidity control curtain at a minimal elevation of 3 inches above the water line.

Top Tension Cables: The top tension cable shall be 5/16" galvanized steel cable placed on each side of the curtain. The breaking strength of the tension cable shall be 10,000 lbs. per cable with a total breaking strength of 20,000 lbs.

Bottom Ballast Chain: The bottom ballast chain shall be 3/8" galvanized steel chain placed at the bottom on the skirt. The chain shall be finished off on both ends with a stress plates with a 1-ton hook on one end and ring on the other end. The breaking strength shall be 10,600 lbs. and weight shall be 1.50 lb./ft.

Fasteners: Top 18 inches shall consist of marine grade aluminum slide connectors and grommets for lacing from below the connector to bottom edge of skirt. The edges shall be reinforced with 5/8" poly rope with a minimum breaking strength of 800 lbs.

Anchors: The anchor shall consist of a leader chain, nylon rope, heavy duty marker buoy and 6 ft. of painted line. The anchor can be a grappling hook, plow or fluke-type and digs into the river bottom/harbor. The nylon rope shall act as an anchor line between the anchor and buoy. The

anchor line shall have enough slack to allow the barrier to float freely with tidal changes without pulling the curtain below the water surface. The anchors shall be placed every 50 ft. to 100 ft. Alternate anchoring methods such as heavy concrete weights, driven pilings, or stakes may be used if approved, prior to use, by the Environmental Scientist.

Construction Methods: Prior to any river disturbance within the Project limits, the Contractor shall submit to the Environmental Scientist for review and approval, through the Engineer, the Type III Impermeable Turbidity Barriers to be used. Within 30 days of receipt of the submittal, the Engineer will notify the Contractor whether the submittal is approved, rejected or requires modifications. If any part of the plan is not approved, the Contractor shall promptly make any necessary changes and re-submit the entire plan for approval. The entire plan must be approved in writing prior to beginning any in-water work within the Project Site.

General: When assembling and installing a turbidity control curtain, the Contractor shall follow the directions of the manufacturer.

Unless otherwise directed by the Environmental Scientist, the Contractor shall begin installation at high tide from a shoreline anchorage and work along with the current in a downstream direction.

The turbidity control curtain shall form a continuous vertical and horizontal barrier able to contain suspended sediment or turbidity within the river. The bottom skirt shall be suspended a minimum of 12 inches off the bottom of the river for the entire length of the turbidity curtain during high tide.

Installation of Turbidity Curtain: The turbidity control curtain shall be floated into position, attached to the anchor lines, and then unfurled.

The Contractor shall securely attach curtain panel ends together using rope lashings. The top lashing shall be securely tied to the anchor line.

The Contractor shall place the anchors such that the turbidity control curtain remains in the proper location and none of the flotation devices are pulled under the water surface. If directed by the Engineer, the Contractor shall supply and place additional anchorage.

Maintenance of Turbidity Curtain: Throughout the Project duration, the Contractor shall maintain the turbidity control curtain so that no sediment caused by the Project enters the Norwalk River beyond the limits of the turbidity control curtain.

Turbidity control curtains damaged prior to installation, during installation, or during the life of the Contract shall be repaired or replaced to the satisfaction of the Environmental Scientist.

Removal of Turbidity Curtain: The turbidity control curtain shall remain in place until all regulated in-water work for the Project is complete and the turbidity level has settled to preconstruction conditions.

When directed by the Environmental Scientist, the turbidity control curtain shall be furled in place, then released from its anchors and towed out of the water. The turbidity control curtain and all materials incidental to the construction of the turbidity control curtain shall be removed in such a manner as to minimize turbidity within the Norwalk River.

The turbidity curtain and related components shall become the property of the Contractor and shall be removed from the Project.

Method of Measurement: This item will not be measured for payment and shall be included under the lump sum contract "ITEM NO. 0100154A – GUARANTEED MAXIMUM PRICE".

Basis of Payment: This item will be paid for under the contract lump sum price for "ITEM NO. 0100154A – GUARANTEED MAXIMUM PRICE".

ITEM #0952051A – CONTROL AND REMOVAL OF INVASIVE VEGETATION

Description: This work shall include the development and implementation of an Invasive Vegetation Removal Plan (IVRP) to outline the materials, labor, and equipment the Contractor plans to use for the complete eradication and treatment of the invasive vegetation within the Tidal Mitigation Sites. The work shall also include the identification, removal, and off-Site disposal of unwanted vegetation as indicated on the plan sheets, permits or as directed by the Environmental Scientist from the Office of Environmental Planning (OEP).

All invasive vegetation listed on the following websites will be subject to eradication:

- Connecticut Invasive Plant Working Group (CIPWG) Invasive Plants Council (http://cipwg.uconn.edu/invasive_plant_list/)
- US Army Corps of Engineers (ACOE) New England District Compensatory Mitigation Guidance Appendix K (http://www.nae.usace.army.mil/portals/74/docs/regulatory/Mitigation/2016_New_England_Compensatory_Mitigation_Guidance.pdf)

All vegetation designated for removal shall be eradicated in its entirety in accordance with the IVRP submitted by the Contractor and approved by the Engineer. The use of herbicides will not be permitted between the dates of September 15 and May 15. These dates may be changed under the direction of the Environmental Scientist or their approved delegate, based on the given yearly seasonal weather patterns.

Materials: All herbicides shall be registered for the species being treated and shall be formulated as applicable for target-species foliar treatment, cut surface, or injection applications. Where work in or immediately adjacent to wetlands is necessary, the product label(s) for any chemical/adjuvant formulation applied must indicate that the formulation is approved for aquatic environments.

Construction Methods:

1. Tidal Mitigation Sites (Site 1, Site 2, Site 3, Site 4, Site 5 and Site 6B): The invasive vegetation within these areas are to be treated by herbicide method only. Herbicide is to take root for 7-10 days. After the 7-10 day period and approval by the Environmental Scientist, the Contractor shall manually flush cut any invasive vegetation present as close to the existing grade as possible. All flush cut material is to be manually bagged for off-Site disposal.

For Site 2, the invasive vegetation shall be treated above the Coastal Jurisdictional Line (CJL) in accordance with the guidelines listed in the previous paragraph.

2. IVRP: Prior to any ground disturbance within the Project limits, the Contractor shall submit an IVRP to the Environmental Scientist for review and approval through the Engineer. Within 30 days of receipt of the submittal, the Engineer will notify the Contractor whether the IVRP is approved, rejected or requires modifications by the Contractor. If any part of the plan is not approved, the Contractor shall promptly make any necessary changes and re-submit the entire plan for approval. The entire plan must be approved in writing prior to beginning any work on-Site.

The IVRP shall include a schedule and outline with the following information:

1) The Contractor's methods of determining invasive vegetation surveyed limits, including:
    a. Stake out the limits prior to the initial treatment
    b. Maintain a record of the staked limits throughout the life of the Contract
2) Identification of the type(s) of invasive species present within the field surveyed limits
3) A marked up plan sheet outlining the invasive species limits and identifying the types of invasive species present within those limits and total square yards of proposed removal
4) For each species present on-Site, the following shall be described:
    a. Methods to eradicate specific invasive plant species for the life of the Contract and shall include the 1-Year Control and Removal of Invasive Vegetation Warranty Period eradication methods for each plant species
    b. Types and concentrations of any herbicides to be used, including any adjuvants, SDS sheets, types of tools or machinery to be used
    c. Schedules showing dates and eradication methods for life of the Contract including the 1-Year Control and Removal of Invasive Vegetation Warranty Period
5) All invasive species are considered controlled materials and are to be taken off-Site to an approved disposal facility. For disposal methods:
    a. Provide address of location, current permits / letters from the town authorizing such activity and a Site map (complete with regulated areas)
    b. Invasive plants shall not be buried on-Site
6) Proof of CT DEEP licensure for herbicide application
7) A description of safety equipment required
8) Procedures for handling chemical spills

No equipment or vehicles to complete the work will be permitted within the Tidal Mitigation Sites. Treatment within the Tidal Mitigation Sites shall be done manually. Any equipment used to process invasive vegetation must be cleaned prior to further use.

Any invasive species control and removal work performed throughout the duration of the Contract that causes damage or soil disturbance shall be repaired at the Contractor's expense within 7 days. It is the Contractor's responsibility to identify additional areas of concern for invasive vegetation within the limits of the Project, notify the Engineer, and to amend the IVRP. The Contractor shall be responsible to identify invasive vegetation at all times of the year and to prepare a plan for its eradication without assistance.

Herbicide applications will not be permitted during any rain event or during windy conditions. Broadcast or uncontrolled spray application will not be permitted and care must be taken to avoid contacting non-target native species. If any non-target native species to remain within the Project limits are inadvertently treated with herbicide and perish, the Contractor will be responsible to replace in-kind species at no cost to the State.

Remove all twining vines in treetops to the greatest extent possible without damaging the branches of the supporting desired vegetation. Cut and remove vines overtopping tree canopies to the extent practical. Climbing spikes will not be permitted for aerial work.

The Contractor shall also:

1) Maintain the labels for herbicides being used in his/her possession
2) Conduct all herbicide formulations and applications, including the addition of appropriate surfactants and other adjuvants, in strict conformance with the manufacturer's recommendation and per requirements of regulatory agencies
3) Maintain a written record of herbicide application, including the formulation, concentration, area treated, and date for each application. The records are to be provided by the commercial applicator and submitted to the Engineer following each treatment

Any invasive vegetation to be flush cut shall not be more than 2 inches above the ground line. Prune out any branches on non-treatment plants that are damaged during removal of vegetation. All corrective pruning shall conform to the National Arborists Association Pruning Standards.

Wherever removal operations result in exposed soils, disturbed areas shall be vegetatively stabilized with the appropriate seed mix, topsoil and placed above the CJL.

Once the IVRP is approved, a field review shall be scheduled for the Contractor and Environmental Scientist to review the limits of invasive species removal (surveyed and flagged by the Contactor prior to the meeting), the specific species required to be removed, and the Contractor's submitted invasive species removal plan. At this time, the Environmental Scientist may identify additional invasive species or designate additional areas for removal that are not included with the Contractor's submitted IVRP.

If changes are required to the approved IVRP during the life of the Contract, these changes shall be documented by the Contractor and resubmitted to the Environmental Scientist through the Engineer for review and approval a minimum of 10 days prior to beginning of the additional work associated with the change. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment.

2. Invasive Treatment: The treatment schedule below may be modified based on the Contractor's construction schedule or existing field conditions at the discretion of the Environmental Scientist. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment.

Treatment Measures: At minimum, the Contractor shall treat all areas within the optimal growing season between May 15 and September 15. Treatment shall occur twice a year in each year of the Contract until the final year of the Walk Bridge completion or as the Contractor's schedule allows. Specifically, one in the late spring and the second in the late summer. Additional treatment measures may be warranted within the same optimal growing season in any year at the discretion of the Environmental Scientist.

1-Year Control and Removal of Invasive Vegetation Warranty Period: A one-year warranty to treat invasive species at all Sites will be required. The dates for the one-warranty shall be scheduled to be specific for each Site that was treated the previous year. The treatment for one-year warrant shall occur within the optimal growing season between May 15 and September 15. Only one treatment will be required for the one-year warranty.

Method of Measurement: This work will be measured for payment by the number of square yards of invasive vegetation identified, surveyed, treated and eradicated as required including any required re-treatment of any regrowth or new growth. No additional payment will be made for subsequent treatments. The area for removal will be surveyed and flagged prior to treatment and measured. After a review of the surveyed limits, the Engineer may designate additional areas for removal that are not shown on the plans. These additional areas will be measured for payment and included as part of the Contract work.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Control and Removal of Invasive Vegetation." This payment shall include all labor, surveys, materials, tools, and equipment necessary for limits of the invasive area(s); maintenance of the limits throughout the Project; species identification; and cutting, treating, re-treating, removal, and off-Site disposal of designated invasive plant material. Off-Site disposal of residue shall include the loading, transport, dumping, and fees associated with legal off-Site disposal.

- Upon approval of the required IVRP, the Contractor will receive a payment equal to 20% of the estimated Contract value
- Upon successful completion of the treatment period in the final year of the Contract as determined during the Site review by the Engineer, the Contractor will receive a payment equal to 40%
- Upon successful completion of the 1-Year Control and Removal of Invasive Vegetation Warranty Period covering all treated Sites on the Project, the Contractor will receive a final payment equal to 40%

Vegetative stabilization of disturbed areas will be paid for under the respective Contract Items: "Turf Establishment," "Wetland Grass Establishment," "Conservation Seeding for Slopes," "Floodplain Establishment," "Wildflower Establishment," or "Shoreline Grass Establishment."

Pay Item	Pay Unit
Control and Removal of Invasive Vegetation	s.y.

ITEM #0949875A – WETLAND PLANTINGS

Amend Section 9.49 as follows ***for Wetland Mitigation Area(s) only****:*

Article 9.49.01—Description: *Add the following:*

Work under this item shall also include furnishing, installing, trees, shrubs and herbaceous stock of the type and size indicated in the Mitigation Planting Schedule and Mitigation Planting Plan for the Wetland Mitigation Area(s). Work in the Wetland Mitigation Area(s) will be performed under the direction of an Environmental Scientist from the Connecticut Department of Transportation's Office of Environmental Planning (OEP).

Article 9.49.02—Materials: *Add the following:*

The trees, shrubs and herbaceous stock to be planted within the Wetland Mitigation Area(s) shall be native varieties of those species listed in the Mitigation Planting Schedule of the Mitigation Planting Plan. The Environmental Scientist must approve any species substitutions from the Mitigation Planting Plan a minimum of 30 days in advance and receive regulatory approval of any substitutions prior to health inspection by DOT Landscape Design Unit and delivery to the Site. If substitutions are proposed, the Contractor must provide OEP with documentation from 5 wholesale plant material sources of supply indicating that the species type or size listed in the Mitigation Planting Schedule is not available. No cultivars or hybrids of any species will be allowed as a substitution.

If backfill material is required within the Wetland Mitigation Area(s) due to over excavation of the Site, as determined by the Environmental Scientist, it shall meet the soil requirements of the Tidal Wetland Creation special provision.

Article 9.49.03—Construction Methods:

1. **Planting Season:** *Add the following:*

All Plant Material to be Installed (Including Deciduous and Evergreen)

April 15 to October 15 (inclusive for ***TIDAL WETLAND MITIGATION***):
For **Tidal Wetland Mitigation Area(s)**, installation of all trees, shrubs, and herbaceous plantings must be initiated after final grade of the Site has settled and has been evaluated for tidal flows during a specified time period provided by the Environmental Scientist. Upon OEP review and evaluation of tidal conditions, planting must be performed and completed within the specified period, or as otherwise directed by the Environmental Scientist.

For tidal Wetland Mitigation Area(s), a schedule for planting must be submitted by the Contractor and approved by the Environmental Scientist at least 30 days prior to planting. Plant locations shall be as generally depicted in the planting plan for the Wetland Mitigation Area(s) or as directed by the Environmental Scientist.

3. Layout: *Add the following:*

For Wetland Mitigation Area(s), the Contractor shall review Site conditions and inform the Environmental Scientist of any conflicts. The Contractor shall coordinate planting layout with the Environmental Scientist for approval.

4. Excavation: *Add the following:*

For Wetland Mitigation Area(s), planting areas shall be prepared by use of approved tools or machinery. All undesirable invasive species shall be removed in accordance with the requirements detailed in the Control and Removal of Invasive Vegetation special provision. Roots, debris or other obstructions shall be removed from the planting areas. All undesirable material shall be removed from the Site and disposed of by the Contractor in a manner satisfactory to the Engineer.

5. Pits: *Add the following:*

Plant pits within the Wetland Mitigation Area(s) must be hand dug. Machinery may be allowed for use in limited areas, with prior approval of the Environmental Scientist.

6. Backfill: *Add the following:*

For Wetland Mitigation Area(s), backfill shall be as specified in the Tidal Wetland Creation special provision.

8. Setting Plants: *Add the following:*

d. Setting of Herbaceous Stock in Wetland Areas: Herbaceous stock shall be planted within planting cells or clusters, such that individual plants of the same species are grouped together within each cell. The term planting cells refers to the discrete clusters of plants shown on the approved Mitigation Planting Plan. If plant species are not shown planted in discrete clusters, the planting cell is the entire Wetland Mitigation Area(s). Planting cells shall be installed as shown on the plans according to their wetland indicator status or as directed by the Environmental Scientist.

e. Setting of Trees and Shrubs in Wetland Areas: Trees and shrubs shall be installed as shown on the Mitigation Planting Plan or as directed by the Environmental Scientist. The placement of trees and shrubs must be identified in the field and approved by the Environmental Scientist prior to installation and placed according to their wetland indicator status. All trees and shrubs in the Wetland Mitigation Area(s) shall be set so that they are level with the microtopography within the immediate area. For each species of tree or shrub, the number of plants shall be evenly distributed within each planting zone, or as directed by the Environmental Scientist.

f. During planting, the Environmental Scientist may relocate up to 50% of the planting cells from the locations shown on the plans to ensure the survivability in accordance with Army Corps of Engineers Mitigation Guidance. All plants shall be set manually, and any relocated planting cells shall be placed in locations with suitable hydrology and soils, and where appropriate structural context with other planting cells can be maintained, as determined by the Environmental Scientist.

9. Fertilizing: *Add the following:*

Fertilizing within the Wetland Mitigation Area(s) is strictly prohibited.

10. Watering: *Add the following*

Watering within the Wetland Mitigation Area(s) is strictly prohibited.

11. Guying and Staking: *Add the following:*

For Tidal Wetland Mitigation Area(s), the guying and staking within coastal areas may occur above the higher elevation between the Coastal Jurisdictional Limit (CJL) or High Tide Limit (HTL) or as directed by the Environmental Scientist to stabilize plantings due to tidal flows.

12. Wrapping: *Delete Section.*

13. Pruning: *Delete Section.*

14. Spraying: *Delete Section.*

15. Mulching: *Add the following:*

For Tidal Wetland Mitigation Area(s), the mulching within coastal areas may occur above the higher elevation between the Coastal Jurisdictional Limit (CJL) or High Tide Limit (HTL) or as directed by the Environmental Scientist.

17. One-Year Establishment Period: *Add the following:*

A one-year review will be required from the date of initial plant installation within the Tidal Mitigation Areas. The Environmental Scientist will identify, list and quantify dead or rejected plants. The Contractor shall furnish and install new plants as directed by the Environmental Scientist. Dead or rejected plants need not be removed from Wetland Mitigation Area(s).

Add the following at the end of Article 9.49.03:

18. Control and Removal of Invasive Vegetation: The Contractor shall control and eradicate the presence of invasive species within the Wetland Mitigation Area(s) and a minimum of 50 feet around the perimeter of the Wetland Mitigation Area(s) limits. Invasive vegetation removal,

if required, shall be as specified in the Control and Removal of Invasive Vegetation special provision.

Article 9.49.04—Method of Measurement:

Add the following ***for Wetland Mitigation Area(s)*** *only:*

Wetland Plantings will be measured for payment as a Contract lump sum item.

Article 9.49.05—Basis of Payment: *Add the following:*

Wetland Plantings will be paid for at the Contract lump sum price for "Wetland Plantings," which price shall include all materials, tools, equipment, labor and work incidental thereto. The Contractor shall submit to the Department a Schedule of payment values for review and comment prior to payment.

Replacement of dead or rejected plants required within 1 year of the initial planting installation will not be measured for payment. The Environmental Scientist will inspect the wetland plants 1 year after initial installation, and determine the number and types of replacement plants to be provided. Forty percent (40%) of the Contract value for this item will be withheld until final acceptance of the mitigation plantings.

Pay Item	Pay Unit
Wetland Plantings	l.s.

SECTION 1.10 ENVIRONMENTAL COMPLIANCE

In Article 1.10.03—Water Pollution Control:
REQUIRED BEST MANAGEMENT PRACTICES

Add the following after Required Best Management Practices Number 13:

14. In-river Water Quality Monitoring, complying with permit requirements, will be required whenever in-water work is being performed to verify that construction activities are not causing migration of sediment in the Norwalk River, which is the location of sensitive downstream receptors (e.g. shellfish).

In-water work consists of any activity that is performed on the Project that disturbs sediments within the Norwalk River. The Water Quality Monitoring Plan is designed to ensure that the protective measures associated with such work are functioning as designed.

The Engineer shall be responsible for the oversight of the water quality monitoring program; however, the equipment, maintenance, and a boat (with all necessary safety gear) for access will be provided by the Contractor in accordance with the Contract Documents.

All construction personnel shall be notified of the water quality monitoring requirements. At least 3 days prior to the commencement of any in-water work or change of activity within the Norwalk River, the Contractor shall coordinate with the Engineer for proper oversight and to ensure the following protocols are followed and maintained during the Project:

a) The Contractor, in consultation with the Engineer, will deploy stationary monitoring equipment at a minimum of 100 feet and a maximum of 500 feet north and south of the in-water work to serve as the background stations that will establish the baseline for the action levels indicated below. These distances listed above are approximate and monitors shall be field located with due consideration given to safety, marine traffic, and other conditions. The Contractor shall document in writing any modifications to the intended distances, including the rationale for the new location, for approval by the Engineer prior to permit submittal and/or installation.

b) The Engineer will determine approximate location for the equipment used for monitoring the in-water work. The Contractor will then determine installation locations based on field conditions. The locations shall be as follows:

   i) For activities behind marine enclosure, the monitor will be placed 100 feet downstream of the turbidity curtain; and

   ii) For dredging activities, the monitor will be placed 200 feet downstream of the turbidity curtain or as spacing is practical in the field.

All distances listed above are approximate and monitor locations may be modified due to safety, marine traffic, construction activities, or other concerns. Depth of fixed location

meters shall be 3-4' below mean low tide line, unless depth of water does not allow for this depth.

Monitoring Program Implementation

a) The monitoring station will issue an automatic notification any time the in-water work monitoring location results determines if there is an Action Level Exceedance. An Action Level Exceedance is defined as any time the in-water work monitoring location indicates that the current monitoring reading is higher than the previous 15-minute reading by:

   i) Five (5) NTUs when background turbidity is 0 – 15 NTUs

   ii) 35% increase when background turbidity is greater than 15 NTUs

b) All Action Level Exceedances will be investigated by the Engineer in accordance with the following procedure:

   i) 0 - 30 Minutes after Exceedance - The Engineer will investigate if the upstream levels are experiencing a similar fluctuation.

      The Engineer will review the monitoring data to determine if the exceedance is consistent with the previously observed natural river conditions. These natural river conditions may include marine traffic, marine life, and other natural or man-made conditions that are outside the control of the Contractor

      The Engineer will communicate with the equipment operator to determine if a visible plume is observed exiting the protective measures and if anything occurred during construction activities that may explain the exceedance. If there is a visible plume, all in-water construction activity shall cease until the cause is discovered and corrected. Work will not proceed until conditions outlined below in Resumption of Work After an Exceedance are met.

      Should fluctuation be similar with background readings at monitoring points away from construction and there is no visible plume exiting the protective measures, the Engineer will document the occurrence and all findings in a log and wait for the next 15-minute reading before taking action.

      Should the increase not be able to be confirmed as consistent with natural fluctuations, or a visible plume discovered, the Engineer will report to the area with hand-held turbidity monitors and will monitor the real-time data to establish a trend. In the event that a visible plume is seen leaving the turbidity curtain, all in-water construction activity shall cease until the cause is discovered and corrected. Work will not resume until conditions outlined below in Resumption of Work After an Exceedance are met.

ii) 30 – 60 Minutes after Exceedance - If, after 30 minutes the downstream monitor is still reporting an exceedance of the numerical criteria, the Engineer will visit the monitoring station. The monitoring station will be checked and the turbidity measurement will be confirmed with a hand held turbidity meter. If the supplemental measurement confirms the exceedance or a visible plume is observed exiting the turbidity curtain, the curtain will be inspected for damage and the construction activities will be investigated. Construction Activities will be suspended until any visible plume leaving the work area is corrected.

Should maintenance of the monitoring equipment be required beyond regular defouling/recalibration, work will be suspended until a properly functioning monitor is in place and working, such as a hand-held meter.

Work will not resume until conditions outlined below in Resumption of Work After an Exceedance are met.

60 – 120 Minutes after Exceedance – In the event the cause of the exceedance cannot be corrected within 120 minutes, construction activities will be halted until corrective actions can be implemented. Work will not resume until conditions outlined below in Resumption of Work After an Exceedance are met.

Resumption of Work After an Exceedance

After stopping work to correct or identify the source of a turbidity exceedance, no work will resume until turbidity has normalized. All actions taken, including remedial activities, will be documented by the Engineer and will be discussed at the Construction Progress Meeting with the Contractor.

If there is a fish kill identified during the project, the Engineer will notify the Norwalk Shellfish Commission at 203-838-9807 and the Mayor's Water Quality Committee at 203-854-7824.

15. The Contractor is hereby notified that the state threatened peregrine falcon (*Falco peregrinus)* has been known to nest within the Project area. The peregrine falcon is Connecticut's largest falcon, measuring up to 20 inches. Adults are slate gray above and pale underneath with fine bars and spots of black; they have long pointed wings with a narrow tail. Young falcons have the same composition but are darker underneath and browner all over. Peregrine falcons have adapted to life in urban settings. In Connecticut, they sometimes utilize bridges for nesting and brood rearing purposes. Peregrines will actively and aggressively defend the nest. The peregrine will attack anyone or anything that comes within the area of its nest. The peregrine falcon nesting season occurs between the months of April and July. For this reason, special conditions regarding the timing of work on the structures, and immediate area that have nesting falcons must be adhered to.

In order to protect this species and project personnel, any construction and/or inspection activities which are within 500 feet of an identified nest shall not be permitted during nesting season (between April 1st and July 31st.) Any change in construction sequencing or timing affecting work within 500 feet of a known nest shall not be permitted.

The Contractor shall, through the Engineer, at least 10 days prior to the commencement of any construction activities, arrange for a CT DOT Environmental Inspector from the Office of Environmental Planning (OEP) or their authorized delegate to be available to meet and identify the nest location as well as discuss proper protocol for maintaining environmental commitments made to the protection of this species and habitat.

This species is protected by State laws which prohibit killing, harming, taking, or keeping them in your possession. Workers shall be notified of the existence of peregrine falcons in the area and be apprised of the laws protecting them. Photographs of, and the laws protecting, peregrine falcons shall be posted in the Contractor's and DOT field offices (species ID sheets will be provided by OEP). Any observations of this species are to be immediately reported to the Department.

16. The Contractor will adhere to the following commitments agreed upon during consultations with the Connecticut Department of Energy and Environmental Protections Marine Fisheries Division (CTDEEP Marine Fish) and the National Oceanic and Atmospheric Administration National Marine Fisheries Service Greater Atlantic Region Fisheries Office (NOAA NMFS GARFO):

    a) A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

    b) All pile driving and extraction (including sheet piles) activities will be done enclosed within turbidity curtains.

    c) Dredging, outside of marine enclosures, will be conducted only between December 1st and January 31st, and be within turbidity curtains.

    d) No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

    e) All barge movements will take place during slack water conditions coincidental with high tide to minimize river bottom disturbance.

f) All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

g) All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities will be conducted to only occupy one half of the river at a time (or only occupy 50 percent of the river when working in the middle).