# ITEM 755.45 WETLAND RESTORATION SQUARE YARD

*REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)*

DESIGNER INSTRUCTIONS:

Coordinate with MassDOT Landscape Design and Environmental Services Section.

MODIFY YELLOW HIGHLIGHTED SECTIONS AS APPROPRIATE based on:

* Size and nature of impact. Minimal impacts will not need the full specification and may need NO SPECIAL PROVISION at all.
* Permit requirements. Coordinate changes with other wetland special provisions as necessary.
* Wetland Specialist requirements. If WS is deemed unnecessary (i.e., small/minimally impacted wetlands), delete all references. Consult with MassDOT Environmental Services as necessary.

NOTE:

* If there will be no or minimal soil compaction, tilling is not be necessary.
* If original seed bank is considered sufficient to restore vegetation, seeding is not necessary.
* Incorporate invasive plant management items if required by permits.

## DESCRIPTION

The work under this item shall conform to the relevant provisions of Subsections 120, 751, 765, 767, and 771 of the Standard Specifications and the following:

The work under this item shall include all labor and furnishing of materials to complete the work specified herein to protect and restore existing inland wetland areas that will be temporarily impacted as shown on the drawings and as required by the Engineer.

Inland Wetland Replication work shall be as specified and compensated under that item. Tidal wetland mitigation shall be as specified under the appropr­­­iate item for tidal wetlands.

Restoration Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

[Delete if a Wetland Specialist is not required]

All work shall be in coordination with an approved Wetland Specialist. Wetland Specialist qualifications and requirements shall be per Item 755.75, Wetland Specialist.

## SUBMITTALS – DOCUMENTS

[Select, delete or modify as necessary for project size and permit requirements. For example, a very small impact may not need to be surveyed or need Final Acceptance.]

Survey:To establish or confirm pre-construction baseline elevation of temporarily impacted area(s), a survey shall be submitted to the Engineer prior to any fill or other land disturbance.

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): If applicable, request for a Certificate of Compliance shall be submitted to the Engineer for distribution to appropriate regulatory agencies as specified below.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.76 Wetland Monitoring Reports.

## ASSOCIATED ITEMS AND MATERIALS

[Select/delete/amend as required for specific project.]

**Geotextile Fabric for Temporary Soil Protection** shall be as specified under that item.

**Timber Mat** shall be as specified under that item.

**Compost** shall be in accordance with Subsection 751 and M1.06.0 Organic Soil Additives of the Standard Specifications. Compost shall not contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants. Off-site sources shall be identified and available for inspection prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

**Compost Blanket** shall be as specified under that item.

**Seed Mix**

Required submittals include:

* Certificate of Materials from the supplier shall be submitted and approved 30 days prior to ordering seed. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).
* Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.
* Bill of lading or a notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

Seed mix shall be:

[Insert Mix and Rate of Application.

Wetland seed mixes available at https://www.mass.gov/lists/landscape-design-and-roadside-maintenance.]

**Fertilizers** shall not be used.

**Straw mulch or hydromulch** shall be per Section M6 of the Standard Specifications.

**Plants**

[If no planting is proposed, delete all language applicable to planting and plant material.]

Plant material shall conform to the applicable requirements of Subsection 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the Standard Specifications and as amended below.

Plant Certifications shall be submitted at the time of delivery and shall conform to the Standard Specifications. Plants shall be native species, not cultivars. To the extent possible, plants shall originate from the applicable EPA Level III Ecoregion. The nursery source shall certify the provenance or origin of all plants.

[Select as appropriate]

Plant species and sizes to be included in the Restoration Area shall be as specified on the plans. //OR// as follows: Insert Plant List with Botanical Name/Common Name/Size/Quantity.

Requests for substitutions shall be submitted in writing to the Engineer for review by the MassDOT Landscape Architect, and, if required, the relevant regulatory agency at least thirty (30) days prior to planting. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Transplanting and plant material collected from the wild is prohibited unless approved in writing by the Engineer. Plants shall be selected from certified nurseries.

Dead and failing plants shall be replaced per the requirements of Subsection 771 of the Standard Specifications.

**Water**

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

## CONSTRUCTION METHODS & SEQUENCE

[Delete and amend as necessary for specific project.]

**Site Protection Prior to Impacts**

Prior to any land work, as part of the initial site-walk, the Wetland Specialist shall photo-document the site and provide a summary report of existing conditions as outlined under Item 755.75 Wetland Specialist.

Where and as required vegetation shall be cut flush and area surveyed to establish pre-construction elevations.

Following the cutting and surveying, temporary separation fabric or timber matting shall be placed as required to protect soil and vegetation from compaction, contamination, and/or other damages. Fabric and timber mats shall be placed as specified under the respective items and the Engineer shall approval placement.

**Restoration Upon Completion of Roadway Construction Work**

Sediment Barriers

If required for sediment control during Restoration work (i.e, tilling is required to restore soil), sediment barriers shall be installed along the downslope perimeter of the Restoration Area beginning and ending in the surrounding upland so that no disturbed soil can enter adjacent wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to any soil disturbance. No work shall take place outside the barriers.

Removal of Fill and Grading

Fill and temporary separation fabric or mats shall be removed and disposed of as specified under the respective items.

If required, grades shall be restored to pre-construction elevations as shown in the baseline survey or as required by the Engineer and Wetland Specialist to restore hydrologic functions. Final elevations shall be approved by the Engineer prior to soil preparation and seeding. Grading shall be incidental to this item.

Following approval of grading to elevations required, soil shall be prepared and seeded as follows.

[Select scarification or tilling. Amend as needed. Delete what does not apply.]

Soil Scarification

(Recommended where impacts or area is minimal).

Compacted soil shall be scarified with equipment approved by the Engineer. Upon approval of soil scarification, the area shall be seeded with mulch //OR// seeded with Compost Blanket as specified below. Seeding shall immediately follow soil preparation.

Soil Tilling with Compost

(Recommended where compact is severe or organic matter need to facilitate faster restoration).

Two inches of compost shall be applied over the impacted area and soil shall be tilled to a depth of 4 inches below the existing grade. Following tilling, soil shall be raked relatively smooth, or as directed. Upon approval of prepared soil, area shall be seeded and hydromulched.

[Select appropriate seeding method. Delete what does not apply.]

Seeding with Mulch

(Recommended where impacts are minimal and/or importing compost is not cost effective due to size or location of area).

Upon approval of prepared soil, area shall be seeded. Seeding shall be hand broadcast with straw mulch applied per the Standard Specifications and per the manufacturer’s directions. Hydromulch shall be straw or wood fiber only and shall be per the manufacturer’s recommendations.

Seeding with Compost Blanket

(Recommended where practical or already used on project as will facilitate faster restoration).

Application of compost blanket and seed shall be done as one application and shall not begin until the Engineer has approved the site and soil conditions. The Contractor shall notify the Engineer when raked areas are ready for inspection and application of compost blanket and seed.

Compost shall be pneumatically applied (blown on) to a depth of one half to one inch at the same time that seed is broadcast such that seed is covered by a light application of compost.

When planting occurs on projects with compost blankets and seed application, planting shall occur prior to application of compost and seed. Otherwise, compost and seed shall be re-applied to the satisfaction of the Engineer and at not cost to the contract.

Seed tags shall be submitted at time of seeding.

Planting

Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Specifications and as amended below.

Planting Season is May 15-June 15 and September 1-November 1 unless otherwise specified in applicable permit conditions.

Restoration Area shall be planted in the dry. Plants shall be placed according to the planting details and within the range of target elevations and at the spacing shown on the Plans or, if spacing is not indicated on the Plans, at the direction of the Wetland Specialist or the MassDOT Landscape Architect. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer and shall be replaced at the Contractor’s expense.

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by June 1 after fall planting shall be replaced at the Contractor’s expense.

Plant material shall be furnished and installed as indicated including all labor, materials, plants, equipment, incidentals, re-setting of plants (frost heaves, etc), irrigation, re-planting and clean up.

If previously approved species are not available at the time of planting, the MassDOT Landscape Architect will propose substitutions relative to species, size, and quantities. Substitutions shall then be approved by the regulating authority if necessary. Provisions shall be made for a growth warranty as described below or as required by permits.

## PLANT AND SEED ESTABLISHMENT

*Plants* shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by May 15 after fall planting shall be replaced within the immediate or next planting period and at the Contractor’s expense.

*Seeding* that fails to establish according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

## CONDITIONAL ACCEPTANCE OF WORK

[1) Delete references to Wetland Specialist and narrative if not required or considered unnecessary for this project. 2) For small projects where permits allow, Acceptance may be collapsed into one inspection. In this case, modify as needed.]

Conditional Acceptance shall indicate approval of the wetland restoration work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist (if applicable to project) demonstrating that the wetland restoration work was done according to plans (or how modified) and meets required permit conditions (if applicable). The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Restoration Area and the surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

* The target elevations have been restored per the survey or adjusted per the Engineer.  Areas that are too high or too low should be identified along with suggested corrective measures.
* Soil compaction has been mitigated.
* Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
* Hydrology meets performance standards and has been adequately restored.
* Specified seed mix has been seeded and seeded species in the wetland and adjacent upland show signs of good germination and healthy growth.
* Planted woody and herbaceous species (if included) meet specifications and are establishing well.
* There are no invasive plants visible in the restored wetland area.
* Silt fence and non-biodegradable sediment barrier materials have been removed.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Restoration work is not approved, MassDOT will issue a rejection letter requiring corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

## FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Restoration Area. Final Acceptance will initiate the start of the Monitoring Period (if required).

The following conditions shall be inspected and approved for acceptance and payment:

* Hydrology is functioning as intended.
* The desired seeded species are establishing well and cover 100 percent of the restoration area, excluding areas of open water, large boulders or planned bare soil.
* No sediments have entered the wetland.
* Adjacent slopes are stabilized with desirable vegetation.
* Planted woody and herbaceous species (if included) meet specifications and are establishing well.
* There are no visible invasive plants.

If the restoration work is not approved, MassDOT will issue a rejection letter requiring corrective action. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation. Work not approved shall be addressed by the Contractor at no extra cost.

## MONITORING REPORTS FOR REGULATORY COMPLIANCE

[Delete section if no monitoring]

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

* Hydrology is functioning as intended, relative to the preexisting condition of the restored wetland.
* Seeded species are establishing well and cover 100 percent of the area, excluding areas of open water areas or planned bare soil.
* No sediments have entered into wetland.
* Adjacent slopes are stabilized with desirable vegetation.
* All planted species (if included) are living and establishing well.
* There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

## **METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 755.45 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, compost and amendments, seed, mulch, equipment, submittals, maintenance, grading, and incidental costs necessary to complete the work as required.

[Modify payment structure if Acceptance approvals are changed or for permitting.]

Payment shall be as follows:

* 50% upon completion of soil preparation and seeding
* 25% upon Conditional Acceptance
* 25% upon Final Acceptance or approval of the Engineer

[Delete and/or as modify as required. Ensure items and any necessary special provisions are included in the contract.]

Excavation of temporary fill will be paid under Item 120.1

Geotextile Fabric for Temporary Soil Protection will be paid under Item 698.31

Sediment Control Barrier will be paid under Item 767.121

Compost Blanket will be paid under Item 751.73

Timber Mat will be paid under Item 767.91

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

Plants will be paid under the respective items.