TABLE OF CONTENTS – TECHNICAL SPECIFICATIONS

SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

B. Lump Sum is an amount proposed by bidders, stated on the Bid Form, as a price for the construction of an item, as performed to the plans and specifications and accepted by the owner.

1.4 PROCEDURES

A. Payment for work within these Contract Documents will only be made under the Bid Items listed on the Bid Form. The cost for other items of work included in the Contract Documents and/or on the Contract Drawings and not listed below in Part 3 shall be included in the cost of the various Items bid.

B. Bid Items (Unit prices and Lump Sums) include all necessary materials, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. All work for this project shall be performed under the various Bid Items listed on the Bid Form. It is the intent of this provision that the value of all the Bid Items when added together shall equal the Total Bid Price.

E. All Bid Items shall include the cost for all utility coordination, permits, materials, equipment, tools, labor and work incidental hereto.

F. The Owner reserves the right to increase or decrease the bid item quantities, and/or omit any work that he deems necessary to complete the work with two weeks written notice.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 LIST OF UNIT PRICES

1. BID ITEM NO. 1 – SITE PREPARATION – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to perform site preparation activities including but not limited to:

1. Mobilization, and demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies/materials to and from the site, establishment and disassembly of offices, buildings and other necessary facilities for the Contractor's operations at the site.
2. Installation and removal of all temporary anti-tracking pads and temporary construction access route.
3. Installation of permanent maintenance access road.
4. Temporary staging and stockpile areas.
5. Temporary protection of adjacent property, pavement and curbs to remain, structures, benchmarks, and monuments.
6. Temporary protection of existing utilities to remain.
7. Installation and maintenance of temporary erosion and sediment control including but not limited to silt fence/compost filter sock.
8. Street sweeping, dust control, and repair or addition of erosion and sediment controls to ensure adequate control of silt, dust, and debris on and leaving the active work area.
9. The submittal of a Best Management Practices (BMP) plan which shall include an Erosion and Sedimentation Control Plan and a Dust Control Plan.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 1:

Section 01 57 13 – Temporary Erosion and Sediment Control
Section 01 89 13 – Site Preparation Performance Requirements

2. BID ITEM NO. 2 – CONSTRUCTION STAKING & TEST PITS – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to perform construction staking and test pit activities including but not limited to:

1. Reforming construction stake out survey as necessary to construct the project.
   a. Establishing project centerline; re-establishing plan benchmarks; setting additional benchmarks as needed.
   b. Staking project limits and miscellaneous construction survey work.
2. The Contractor shall perform all construction layout and reference staking necessary for accurate control and completion of all structures, gradings, paving,

drainage, and all other appurtenances required for the complete construction and acceptance of the work.

3. Staking layout shall include, but not be limited to, staking clearing line; removal limits; slope staking and slope stake referencing; grade staking (blue top dirt grade and base course grade hubs); paving hub staking; staking of stormwater system (pipes, manhole, and catch basin); and performing the miscellaneous staking as described in the plans and in these specifications.
4. Exploratory test pits as indicated on the plans and as needed to evaluate potential water and gas line conflict.
5. Exploratory test pits at locations indicated or directed to evaluate groundwater elevation and soil permeability of proposed wetland area. Monitoring stand pipe shall be installed to remain after filling of test pits and prior to construction.
6. Test pits as indicated on the plans or as required to complete the work shall be excavated (open cut or vacuum excavation) and backfilled by the Contractor.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 2:

Section 02 20 10 – Construction Staking and Test Pits

3. BID ITEM NO. 3 – MAINTENANCE AND PROTECTION OF TRAFFIC – LUMP SUM (LS)

This item includes, but is not limited to the implementation and maintenance of all safety signage and warning devices necessary to provide adequate warning and control of traffic on Algonquin Rd, Sachem Rd, and Villa Ave, and adjacent roads, if necessary, as shown on the construction plans, described in the specifications, or as otherwise merited by site conditions.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 3:

Section 01 55 30 – Maintenance and Protection of Traffic

Police protection, if required, will be paid for by the Town of Fairfield, and coordinated with the selected Contractor.

4. BID ITEM NO. 4 – SELECTIVE SITE DEMOLITION – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to perform selective site demolition including but not limited to:

1. Removal, disconnecting, capping or sealing, and abandoning in place site utilities.

2. Removal and lawful disposal of junction chamber, catch basin, and any other structures as shown on the plans.
3. Removal and disposal of sediment and debris inside existing 4.5’ H x 6.5’ W stone masonry box, as needed.
4. Pavement and curb saw cutting.
5. Removal and lawful disposal of existing asphalt pavement and base materials to the limits shown on the plans.
6. Removal and lawful disposal of existing concrete pavement and base materials to the limits shown on the plans.
7. Removal of existing curbs and base materials.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 4:

Section 02 41 13 – Selective Site Demolition

5. <u>BID ITEM NO. 5 – WATER CONTROL AND FLOOD CONTIGENCY PLAN – LUMP SUM (LS)</u>

This item includes all labor, materials, tools and equipment as and when required to produce and execute a water control and flood contingency plan including but not limited to:

1. The Contractor shall furnish, install, operate and maintain a trench dewatering system. The system shall ensure that the trench excavation and pipe installation is completed in dry conditions. Removal of water saturated soil will not be permitted.
2. The Contractor shall provide any equipment necessary, such as dewatering pumps and settling tanks or basins, to control water flowing into the drainage systems being installed, bypass clean water around the active work area, and treat all turbid pump discharges prior to water reentering adjacent wetlands or watercourse.
3. The contractor shall control flood flows from nearby waterbodies such that damage to the work area is prevented.
4. The Contractor shall provide standby equipment and power supply for maintaining uninterrupted construction dewatering.
5. Contractor shall maintain drainage along Algonquin Road and Villa Avenue during construction operations. Contractor is responsible for handling the flow from existing catch basin by grading to drain, piping, or other means as designed by the Contractor.
6. The Contractor shall comply with all necessary permits from State and local agencies required for operation of the dewatering system, monitoring groundwater, and disposal of dewatering effluent.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 5:

Section 31 23 40 – Water Control and Flood Contingency Plan

6. BID ITEM NO. 6 – EARTH EXCAVATION – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to perform earth excavation and site clearing including but not limited to:

1. Clearing and grubbing
   a. Felling of trees including removal of stumps, roots, and other debris.
   b. Removing shrubs, grass, weeds, and other understory vegetation.
2. Stripping and stockpiling topsoil for reuse.
3. Pre-construction tree inspection performed by a certified arborist.
4. Protecting existing vegetation to remain.
5. Construction of protection fencing around trees to remain if deemed necessary by owner or owner's representative
6. Protecting of existing landscaping materials, stone walls, and site improvements not scheduled for clearing, which might be damaged by construction activities.
7. Cleanup and removal of material, labor, tools, machinery and processes once construction is completed.
8. Legal disposal of cleared materials including trees and materials generated during clearing and grubbing.
9. Preparing subgrade for slabs-on-grade, walks, pavements, lawns and grasses and exterior plantings.
10. Preparing subgrade for temporary access route, anti-tracking pad and permanent maintenance access road.
11. Processed aggregate base for footings, pavement repairs, concrete sidewalks, etc. as indicated on the Contract Drawings.
12. Excavating and backfilling for utility trenches and storm drainage structures.
13. Wetland creation excavation and earth moving operations as necessary to the limits shown on the plans, profile, and cross section drawings to construct the proposed wetland system, including but not limited to wetland cells and riprap filter spillway.
14. General excavation and backfill for site improvements as noted on the plans.
15. Soil compaction control.
16. Clean fill from off-site sources, if required.
17. Transport and legal removal of excess materials off-site, if required.
18. Legal disposal of excess or unsuitable materials off-site, if required.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 6:

Section 31 10 00 – Site Clearing
Section 31 20 00 – Earth Moving

7. BID ITEM NO. 7 – SHALLOW WETLAND – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to create a shallow wetland system including but not limited to:

1. Construction of a shallow wetland system as indicated on the Contract Drawings.
2. Installation of topsoil as needed.
3. Installation of wetland plants.
4. Installation of riprap filter spillway and emergency riprap spillway in constructed wetland as shown on the plans and profile.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 7:

Section 32 71 00 – Constructed Wetlands
Section 32 91 13 – Topsoil
Section 32 93 00 – Plants
Section 35 41 20 – Riprap Filter Spillway

8. BID ITEM NO. 8 – STORM DRAINAGE UTILIT & DRAINAGE SWALE – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to furnish and install storm drainage utilities and drainage swale including but not limited to:

1. Storm drainage piping, fittings, and accessories.
2. Connection of drainage system to municipal sewers, if required.
3. Catch basins, junction chambers, and drainage swale.
4. Modular precast concrete manhole sections with tongue-and-groove joints, covers, anchorage, and accessories.
5. Drainage swale.
6. Installation of outlet protection as indicated on the drawings.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 8:

Section 33 40 00 – Storm Drainage Utilities
Section 35 43 61 – Outlet Protection

9. BID ITEM NO. 9 – SITE RESTORATION – LUMP SUM (LS)

This item includes all labor, materials, tools and equipment as and when required to restore the site including but not limited to:

1. Restoration of all temporary anti-tracking pads and temporary construction route.
2. Restoration of the permanent maintenance access road.
3. Topsoil, planting, seeding and mulching all disturbed areas.
4. Sidewalk, curbing and road repair after installation of drainage utility.
5. Preconstruction and postconstruction condition survey and any other work incidental to the full repair of construction disturbance areas, and restoration of the site.

There will be no measurement for this work. This work will be paid for at the contract lump sum price bid as a percentage of completion as determined by the Engineer.

The following sections shall be covered under payment for Bid Item No. 9:

Section 32 12 16 – Asphalt Paving
Section 32 13 13 – Concrete Paving and Curbing
Section 32 30 10 – Site Restoration
Section 32 91 13 – Topsoil
Section 32 93 00 – Plants

10. BID ITEM ALLOWANCE A1 – UTILITY RELOCATION COORDINATION ($25,000)

This item includes all labor, materials, tools and equipment as and when required to coordinate utility relocation. Measurement and payment for this work will be on a Time and Material (T&M) basis for contractor to coordinate relocation with utility providers, if necessary.

3.2 SUBMITTALS

A. *Section 01 57 13 – Temporary Erosion and Sediment Control*

1. Best Management Practices (BMP) Plan; Erosion and Sedimentation Control Plan and Dust Control Plan.
2. Manufacture specification, product data, and/or certifications for all erosion and control material.

B. *Section 02 41 13 – Selective Site Demolition*

1. Methods of removal/disconnection/capping/sealing and equipment to perform the work.
2. Water Management Plan.
3. Records and disposal documentation.

C. *Section 03 41 40 – Precast Concrete Headwall*

1. Fabricator certification with each precast endwall.

D. *Section 31 10 00 – Site Clearing*

1. Certified Arborist qualifications.
2. Tree protection product data.

E. *Section 31 20 00 – Earth Moving*

1. Pre-excavation Photographs or Videotapes.
2. Gradation reports of fill materials.

F. *Section 31 23 19 – Water Control and Flood Contingency Plan*

1. Water Control Plan and Flood Contingency Plan.

G. *Section 32 12 16 – Asphalt Paving*

1. Extended Season Paving Plan, if operations during extended season is approved.
2. Laboratory certified test reports and accurate density inspection reports within 48 hours following the daily paving operations.

H. *Section 32 13 13 – Concrete Paving and Curbing*

1. Product data, design mixtures and shop drawings.

I. *Section 32 71 00 – Constructed Wetlands*

1. Soil testing, if determined to be required.

J. *Section 32 91 13 – Topsoil*

1. Fertilizer (if required) data sheets, specifications, performance data, physical properties, and manufacturer's certificates or labels.
2. Topsoil and compost samples, test report, and sources.

K. *Section 32 93 00 – Plants*

1. Seed mixture product data sheets, specifications, performance data physical properties and product sample. Manufacturer's certificates or labels for seed mixture and planting materials.
2. Planting Schedule and maintenance instructions.

L. *Section 33 40 00 – Storm Drainage Utilities*

1. Product data for drainage pipe, trench drain, gasket material, and any of the miscellaneous drainage items.

2. Shop drawings for concrete storm drainage manholes, catch basins, junction chambers, area drains, and drywells, including frames, covers, grates, outlet control structure, and water quality unit.

END OF SECTION 01 20 00

ITEM	DESCRIPTION	UNIT	SPEC REF	ESTIMMATED QUANTITY	BID UNIT PRICE	BID PRICE
1	Site Preparation	LS	01 57 13 01 89 13	1	$_____	$_____
2	Construction Staking & Test Pits	LS	02 20 10	1	$_____	$_____
3	Maintenance and Protection of Traffic	LS	01 55 30	1	$_____	$_____
4	Selective Site Demolition	LS	02 41 13	1	$_____	$_____
5	Water Control and Flood Contingency Plan	LS	31 23 40	1	$_____	$_____
6	Earth Excavation	LS	31 10 00 31 20 00	1	$_____	$_____
7	Shallow Wetland	LS	32 71 00 32 91 13 32 93 00 35 41 20	1	$_____	$_____
8	Storm Drainage Utility & Drainage Swale	LS	03 41 40 33 40 00 35 43 61	1	$_____	$_____
9	Site Restoration	LS	32 12 16 32 13 13 32 30 10 32 91 13 32 93 00	1	$_____	$_____
ALLOWANCE						
A1	Utility Relocation Coordination				$25,000	$25,000
TOTAL BASE BID (Sum of Items 1-9 and A1)					$_____	

SECTION 01 55 30 – MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. Contractor to install temporary traffic control signs on Algonquin Rd, Sachem Rd, Collingwood Avenue, Pequot Road, and Villa Ave. in all directions from the work site access points to warn motorists of the construction site as shown on the construction plans.

B. The contractor shall restore any damage done during construction upon completion of the work.

C. The contractor will be responsible for removing all temporary traffic controls at the completion of the project.

D. Police protection, if required, will be coordinated between the Town of Fairfield and the Contractor.

PART 2 – PRODUCTS

2.1 All construction signing shall conform to the standards in the manual on Uniform Traffic Control Devices (MUTCD), the Standard Specifications.

2.2 Contractor shall coordinate flagmen and/or police officers depending on the town requirements.

PART 3 – EXECUTION

3.1 Maintain existing ingress and egress to Algonquin Rd, Sachem Rd, and Villa Ave, and to all of the private residences in the area of construction.

3.2 Maintain all lanes of traffic on all public and private streets throughout the area.

3.3 Coordinate flagmen and/or local police traffic person as required when construction equipment and trucks enter and exit the site.

3.4 Temporary signs and other temporary traffic protective devices shall remain and be properly maintained in place throughout the full duration of the project.

3.5 Traffic signs shall be mounted on posts when feasible.

3.6 The Contractor shall notify the Owner and Town at least 14 days in advance of proposed implementation of the Traffic Control Plan.

3.7 The Contractor shall implement the Maintenance and Protection of Traffic Plan before the start of construction.

END OF SECTION 01 55 30

SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Work shall include the furnishing of ALL materials, labor, and equipment needed to place and maintain erosion controls, including but not limited to anti-tracking pad, silt fences/compost filter sock. Street sweeping, dust control, and repair or addition of erosion and sediment controls to ensure adequate control of silt, dust, and debris on and leaving the active work area.

B. The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. The Contractor's attention is specifically directed, but not limited, to the following sections:

- Section 1.10 – Environmental Compliance
- Section 2.11 – Anti-Tracking Pad
- Section 2.19 – Sedimentation Control System
- Section 2.86 – Drainage Trench Excavation, Rock in Drainage Trench Excavation
- Section 9.39 – Sweeping for Dust Control
- Section 9.43 – Water for Dust Control

C. Contractor shall assess the work area, submit a Best Management Practices (BMP) plan, and execute the approved plan.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

1. Section 01 89 13 – Site Preparation Performance Requirements
2. Section 31 10 00 – Site Clearing
3. Section 31 20 00 – Earth Moving
4. Section 31 23 40 – Water Control and Flood Contingency Plan
5. Section 32 30 10 – Site Restoration
6. Section 32 93 00 – Plants

1.3 QUALITY ASSURANCE

A. Codes and Standards:

a. The work shall be consistent with the latest "Connecticut Guidelines for Soil Erosion & Sediment Control" and "Connecticut Stormwater Quality Manual" published by the Council on Soil and Water Conservation in Collaboration with Connecticut Department of Energy and Environmental Protection,

b. In case of conflict between these Special Provisions and the aforementioned standards, these Special provisions shall take precedence and shall govern.

B. Dust Control: The Contractor shall be responsible for controlling visible dust caused by Work operations and the moving of vehicles and equipment. Dust control shall be implemented when soils are exposed, before, during and after Work activity ceases. Dust control will also be required on the weekends. The Contractor shall utilize the application of water or other

methods, subject to the Engineer's approval, when visible dust is present on-site, in accordance with the Health and Safety Plan. The use of chemicals for dust control, including calcium chloride, will not be permitted.

a. All excavation, loading and transport of materials shall minimize the formation of dust. To prevent dust generation, application of water to roadways and active work areas shall be utilized as required. The Contractor's operations shall include air monitoring and dust minimization measures.

C. Workmanship: all workers shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

1.4 SUBMITTALS

A. Prior to commencing work, the Contractor shall submit in writing to the Engineer an "Erosion and Sedimentation Control Plan" and a "Dust Control Plan" for all construction phases for approval. The plan shall conform with Subarticle 1.3 – Quality Assurance of this section 01 57 13, and all environmental laws and regulations established by Federal, State or municipal agencies.

B. Contractor shall submit manufacture specification, product data, and/or certifications for all erosion control material to be used on site and a plan showing where each material will be installed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials to be used to furnish and install temporary erosion and sediment control, including but not limited to silt fence/compost filter sock and anti-tracking pad, shall conform to all pertinent sections of the latest State of Connecticut Department of Transportation – Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction.

B. Erosion control material specification, product data, and/or certifications shall be submitted prior to installation and is subject to approval. No work shall begin prior to installation of erosion control materials.

C. The use of hay bales is not permitted, Contractor shall use straw bales as a replacement.

PART 3 - EXECUTION

A. Erosion and sediment controls shall be placed by the Contractor in locations shown on the approved plans.

B. All erosion checks shall be maintained until adjacent areas are stabilized. Maintain/replace erosion control as needed and/or as directed by the Owner or Owner's representative.

C. Contractor shall inspect erosion controls weekly and after storm events. Inspection reports shall be prepared and kept on-site. Repair or replacement of affected erosion control measures shall be made promptly as needed.

D. Remove erosion control measures when they have served their usefulness so as not to block or impede storm water flow or drainage.

E. Remove erosion and sedimentation controls and retore and stabilize areas disturbed during removals according to Section 32 30 10 – Site Restoration.

F. Revision to original plan shall be submitted in writing for approval prior to any modification.

END OF SECTION 31 25 00

SECTION 01 89 13 – SITE PREPARATION PERFORMANCE REQUIREMENTS

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 WORK INCLUDED

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

1. Mobilization, and demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies/materials to and from the site, establishment and disassembly of offices, buildings and other necessary facilities for the Contractor's operations at the site.
2. Installation and removal of all temporary anti-tracking pads and temporary construction access route.
    a. Requirements, submittals, materials and execution of shall be coordinated with Section 31 25 00 – Erosion and Sedimentation Controls.
    b. Restoration shall be covered under Section 32 30 10 – Site Restoration.
3. Installation of permanent maintenance access road.
4. Temporary staging and stockpile areas.
5. Temporary protection of adjacent property, pavement and curbs to remain, structures, benchmarks, and monuments.
6. Temporary protection of existing utilities to remain.

1.4 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall be coordinated with the following sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control
2. Section 02 20 10 – Construction Staking and Test Pits
3. Section 02 41 13 – Selective Site Demolition
4. Section 31 10 00 – Site Clearing
5. Section 31 20 00 – Earth Moving
6. Section 31 23 40 – Water Control and Flood Contingency Plan
7. Section 32 30 10 – Site Restoration

1.5 DEFINITIONS

A. Commencement of Construction: The initial disturbance of soils associated with clearing and grubbing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial

installation of erosion and sediment control practices.

B. Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as geological creep, detachment, movement of soil or rock fragments by water, wind, ice, or gravity.

C. Erosion/Sediment Control: Any temporary or permanent measures taken to reduce erosion, control siltation and sedimentation, and ensure that sediment-laden water does not leave the site.

D. Final Stabilization: All soil-disturbing activities at the site have been completed and uniform, perennial vegetative cover with the density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geo-textiles) have been employed on all unpaved areas and areas not covered by permanent structures, concrete or pavement.

E. Receiving Waters: Bodies of water or surface water systems receiving water from upstream manmade (or natural) streams.

F. Sediment: Fragmented material that originates from weathering and erosion of rocks and unsolicited deposits, and is transported by, suspended in, or deposited in water.

1.6 QUALITY ASSURANCE

A. Workmanship: All personell shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Permits and Regulations:

1. The Contractor shall obtain all necessary permits and be responsible for implementing the terms and requirements of these permits as needed and for payment of all fees.

2. The Contractor shall handle all material in compliance with applicable requirements of OSHA and other governing authorities having jurisdiction.

1.7 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to his/her actions.

1.8 PROJECT CONDITIONS

A. Traffic: Conduct site clearing operations to ensure minimum interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close or obstruct streets, walks or other occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place. Protect improvements on adjoining properties and on Owner's property. Restore damaged improvements to their original condition, as acceptable to property owners.

C. Utility Locator Service: Notify utility locator service, "Call Before You Dig" at 1-800-922-4455 for area where Project is located prior to site clearing. Perform test pits to evaluate water and gas line conflict, refer to Section 02 20 10 – Construction Staking and Test Pits and Section 02 41 13 – Selective Site Demolition.

D. Contractor is responsible for establishing staging and stockpiling areas, as defined by the Owner.

E. Perform the work described under Sections 01 57 13 – Temporary Erosion and Sediment Control and Section 31 10 00 – Site Clearing prior to commencing the work described in this Section 01 89 13.

F. Coordinate with property owner's representative for access to the site, staging areas, and disposal site.

1.9 VERIFICATION

A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities and shall immediately inform the Owner's Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner's Representative.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with applicable state and Federal laws.

1. Store and handle materials as recommended in writing by materials manufacturer.

PART 2 – PRODUCTS

2.1 MATERIALS

Materials shall conform to Division III – Materials Section of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements and as specified in these Special Provisions or as indicated on the Contract Drawings and approved by the Engineer.

PART 3 – EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Protect existing site improvements to remain from damage during construction.

C. Restore damaged improvements to their original condition, as acceptable to Owner.

D. The Contractor shall prevent all damage to installations such as: pipes, conduits, wires, cables, or structures above or below ground; the Contractor shall ascertain from the Owners of said utilities or installations any special construction methods or precautions which should be employed while working in proximity to same. No land monuments, property markers, or official datum points shall be damaged or removed until an authorized agent has witnessed or otherwise referenced their location and approved their removal. The Contractor shall so control his operations as to prevent damage to trees and shrubs, which are to be preserved, in accordance with Section 31 10 00 Site Clearing.

E. The locations of all utilities shown on the contract documents are to be considered approximate. The contractor shall notify Call Before You Dig at least one week prior to the commencement of construction activities. Refer to Section 02 20 10 – Construction Staking and Test Pits for evaluation of potential water and gas line conflicts requirements.

3.2 TEMPORARY CONSTRUCTION ACCESS ROUTE & ANTI-TRACKING PAD

A. Install temporary construction haul routes and anti-tracking pads where indicated and in conformance with the contract drawings and Section 01 57 13 – Temporary Erosion and Sediment Control.

B. The location of the access route and anti-tracking pad shall be staked in the field prior to starting construction for approval by the owner and engineer. Locations may be adjusted in order to minimize disturbance to existing trees.

3.3 PERMANENT MAINTENANCE ACCESS ROAD

A. Install 12-feet wide permanent maintenance access road where indicated and in conformance with the contract drawings. Maintenance access road shall be installed prior to commencement of work and shall be used to access the site during construction.

B. The location of the permanent maintenance access road shall be staked in the field prior to starting construction for approval by the owner and engineer. Locations may be adjusted in order to minimize disturbance to existing trees.

C. Place 8” layer of compacted broken stone and compact to elevation indicated on the plan. Cap permanent maintenance access road with 6” layer of compacted granular fill for driving surface.

D. Once construction is completed re-touch maintenance access road as needed and leave it in place.

3.4 CLEANING

A. Keep the ground always clean of rubbish and of unused materials during construction. Coordinate work with Section 31 10 00 – Site Clearing.

B. Remove used materials and equipment. Leave area clean.

C. Do not store hazardous or flammable materials or liquids on site, unless stored in approved containers, properly labeled and approved by the owner.

D. Trash receptacles and recycling containers shall be maintained on site at all times to prevent the accumulation of litter on the project site.

END OF SECTION 01 55 31

SECTION 02 20 10 – CONSTRUCTION STAKING AND TEST PITS

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements.

1.3 The work shall be consistent with the latest "Connecticut Stormwater Quality Manual" published by the Council on Soil and Water Conservation in Collaboration with Connecticut Department of Energy and Environmental Protection,

1.4 In case of conflict between these Special Provisions and the aforementioned standards, these Special provisions shall take precedence and shall govern.

1.5 The work under this section shall be implemented prior to any excavation

1.6 WORK INCLUDED

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

1. Reforming construction stake out survey as necessary to construct the project.
    a. Establishing project centerline; re-establishing plan benchmarks; setting additional benchmarks as needed.
    b. Staking project limits and miscellaneous construction survey work.
2. The Contractor shall perform all construction layout and reference staking necessary for accurate control and completion of all structures, gradings, paving, drainage, and all other appurtenances required for the complete construction and acceptance of the work.
3. Staking layout shall include, but not be limited to, staking clearing line; removal limits; slope staking and slope stake referencing; grade staking (blue top dirt grade and base course grade hubs); paving hub staking; staking of stormwater system (pipes, manhole, and catch basin); and performing the miscellaneous staking as described in the plans and in these specifications.
4. Exploratory test pits as indicated on the plans and as needed to evaluate potential water and gas line conflict.
5. Exploratory test pits at locations indicated or directed to evaluate groundwater elevation and soil permeability of proposed wetland area. Monitoring stand pipe shall be installed to remain after filling of test pits and prior to construction.
6. Test pits as indicated on the plans or as required to complete the work shall be excavated (open cut or vacuum excavation) and backfilled by the Contractor.

1.5 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall be coordinated with the following sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control
2. Section 01 89 13 – Site Preparation Performance Requirements
3. Section 02 41 13 – Selective Site Demolition

4. Section 31 10 00 – Site Clearing
5. Section 31 20 00 – Earth Moving
6. Section 33 40 00 – Storm Drainage Utilities

1.6 QUALITY ASSURANCE

A. Workmanship: All workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Excavation of test pits shall be accomplished by such means as are required to ensure that underground utilities or structures that may be encountered are not damaged. It shall be the Contractor's sole responsibility for any damage incurred during excavation operations. Any such damages shall be repaired or replaced by him (if permitted) to the satisfaction of the Owner/Responsible Agency/Engineer at the Contractor's own expense. When the repair and/or replacement must be done by the Owner/Responsible Agency, any and all costs thereof shall be borne by the Contractor.

C. Notify utility locator service, "Call Before You Dig" at 1-800-922-4455 for area where Project is located prior to construction staking and test pits.

1.7 DEFINITIONS

A. Construction Survey: The survey measurements made prior to or while construction is in progress to control elevation, horizontal position, dimensions and configuration of structures/improvements included in the Project Drawings.

B. Construction Staking: The placement of stakes and markings to provide offsets and elevations to cut and fill in order to locate on the ground the designed structures/improvements included in the Project Drawings.

C. Survey "Field Checks": Measurements made after construction staking is completed and before construction work begins to ensure that structures marked on the ground are accurately located per Project Drawings.

PART 2 – PRODUCTS

2.1 MATERIALS

The materials to be used for the work shall be as specified below or as indicated on the Contract Drawings and approved by the Engineer.

A. The Contractor shall furnish all staking materials of adequate quality for the purpose intended, including all stakes, stake chasers, paint, field note books, and all other materials necessary to properly perform the required work.

B. Stakes shall be suitable for general field construction staking and shall be durable enough to last the duration of the project without undue weathering so as to make the stake illegible or difficult to read or use. Stakes that become illegible shall be remarked or reset at the Contractor's expense.

C. Paint, when used in lieu of plastic flagging to mark survey stakes, shall be brightly colored or fluorescent to be visible from passing equipment. Paint that becomes faded shall be remarked or reset at the Contractor's expense.

D. Plastic flagging shall be brightly colored or fluorescent plastic ribbon securely tied to the survey stake. Plastic flagging that becomes faded, torn or dislodged shall be replaced at the Contractor's expense.

PART 3 – EXECUTION

3.1 CONSTRUCTION STAKING

A. The Owner will furnish the Contractor such control points, bench marks, and other data as may be necessary for the construction staking and layout by qualified engineering or surveying personnel as noted elsewhere herein.

B. The Contractor shall be responsible for the placement and preservation of adequate ties to all control points, whether established by him or found on the project, necessary for the accurate re-establishment of all base lines or center lines shown on the plans.

C. All stakes, references, and batter boards including original, additional or replacement, which may be required for the construction operations, signing and traffic control shall be furnished set and properly referenced by the Contractor. Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans, specifications or special provisions shall be called to the Engineer's attention by the Contractor for correction or interpretation prior to proceeding with the work.

D. Stakes which are damaged, destroyed or made unusable during construction shall be replaced by the Contractor at no additional expense to the City.

E. Upon request of the Engineer, the Contractor shall furnish copies of all data used in setting and referencing all stakes and other layout markings used by the Contractor.

F. When requested by the Engineer, the Contractor shall provide safe facilities for convenient access to control points, batter boards, and references.

G. All staking shall be performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout and staking of the type required under the contract and who are acceptable to the Engineer. The personnel shall perform this staking under the direct supervision of a person, or persons, of engineering background experienced in the direction of such work and acceptable to the Engineer.

H. The Engineer may check the control of the work, as established by the Contractor, at any time as the work progresses. The Engineer will inform the Contractor of any deficiencies identified; however, said notification does not relieve the Contractor of any responsibility for the accuracy of the layout work. Further, the Contractor shall, at his expense, correct or replace as required any deficient layout and construction work which may be the result of inaccuracies in his staking operations or of his failure to report inaccuracies in his staking operations or of his failure to report inaccuracies found in work done by the Engineer or by others. If, as a result of these inaccuracies, the Engineer is required to

make further studies, redesign, or both, all expenses incurred by the Owner due to such inaccuracies will be deducted from any monies due the Contractor.

I. The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, transportation, and work incidental to the accurate and satisfactory completion of this work.

3.2 TEST PITS

A. Test pit excavations shall have neat, clean-cut and vertical sides. Upon completion of the test pit excavation, the Engineer shall be notified so that he can make the necessary location measurements. Excavation and backfilling shall conform to the applicable requirements of Section 31 20 00 – Earth Moving. Hand digging shall be employed when required by the Engineer. The Contractor shall restore the pavement with Temporary Pavement Trench Repair or Permanent Pavement Trench Repair as directed by the Engineer.

B. It shall be agreed that the Contractor entered into this Contract with full knowledge that in any work involving excavation, operation in public highways or adjacent to other developments, some unforeseen utility relocations, obstacles, difficulties, unforeseen soil or groundwater conditions, etc., may be encountered and that the Contractor has included in his bid and contract obligations the assumptions of the risks and costs to which such obstacles, etc., may subject him.

C. The Contractor shall measure and record the size configuration, and exact horizontal and vertical location of all utilities, pipes or other obstacles uncovered in the various pits dug under this Specification.

D. Test Pits: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during test pit excavation. Test shall be performed, as needed. The Contractor may conduct other test pits to verify the location of subsurface utilities.

Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Do not interrupt existing utilities serving facilities except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided.

E. Test pits shall be performed to evaluate potential water and has line conflict where proposed stormwater system will be installed.

F. Test pits shall be performed to evaluate groundwater elevation and soil permeability where proposed wetland area is located. The guidance to evaluate the existing soil shall be in accordance with Chapter 10 – Genera; Design Guidance for Stormwater Infiltration System of the Connecticut Stormwater Quality Manual.

G. The Engineer shall be notified well in advance of the excavation, so that he also may assist in making the necessary measurements to locate all objects within test pits and to record the results.

H. A monitoring stand pipe shall be installed after filling of the test pits in the proposed wetland and prior to construction.

I. Test pits shall be backfilled immediately after their purpose has been satisfied and maintained in a manner satisfactory to the owner and shall conform to all relevant sections of this Specification.

END OF SECTION 02 20 10

SECTION 02 41 13 – Selective Site Demolition

PART 1 – GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 SUMMARY

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

1. Removal, disconnecting, capping or sealing, and abandoning in place site utilities.
2. Removal and lawful disposal of junction chamber, catch basin, and any other structures as shown on the plans.
3. Removal and disposal of sediment and debris inside existing 4.5' H x 6.5' W stone masonry box, as needed.
4. Pavement and curb saw cutting.
5. Removal and lawful disposal of existing asphalt pavement and base materials to the limits shown on the plans.
6. Removal and lawful disposal of existing concrete pavement and base materials to the limits shown on the plans.
7. Removal of existing curbs and base materials.
8. Replacement of paving asphalt, paving concrete and curbing shall be covered under Section 32 12 16 – Asphalt Paving and Section 32 13 13 – Concrete Paving and Curbing.
9. Replacement of storm drainage utilities shall be covered under Section 33 40 00 – Storm Drainage Utilities and Section 33 49 00 – Storm Drainage Structures

1.4 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall not commence prior to the implementation of the work of the following sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control
2. Section 01 89 13 – Site Preparation Performance Requirements
3. Section 02 20 10 – Construction Staking and Test Pits
4. Section 31 10 00 – Site Clearing

Work shall be coordinated with the following section:

5. Section 31 20 00 – Earth Moving
6. Section 32 12 16 – Asphalt Paving
7. Section 32 13 13 – Concrete Paving
8. Section 33 40 00 – Storm Drainage Utilities

1.5 PROJECT CONDITIONS

A. The Contractor shall make a complete investigation of the existing structures, and of any special requirements that may be necessary to perform this work. No extra compensation will be made because of special requirements.

B. The existence and location of underground items are not guaranteed. Investigate and field verify before starting work. Excavation and backfill in the vicinity of existing items of work shall be carried out with extreme caution. Refer to Section 02 20 10 – Construction Staking and Test Pits.

C. Notify utility locator service, "Call Before You Dig" at 1-800-922-4455 for area where Project is located prior to demolition and removals. Perform test pits to evaluate water and gas line conflict, refer and coordinate work with Section 02 20 10 – Construction Staking.

D. Contractor shall be held responsible for any damage and for maintenance and protection of existing utilities.

E. Indicate on record drawings where there is conflict between field conditions and Drawings.

1.6 SUBMITTALS

A. Informational Submittals
   1. Methods of removal/disconnection/capping/sealing and equipment proposed to perform the work. This submittal should be sufficient to demonstrate a thorough understanding of the work to be completed and the means that will be implemented to safely complete the removal/disconnection/capping/sealing within the Contract Time without damage to surrounding structures or resources.
   2. Waste Management Plan to indicate the types of waste to be generated and the proposed disposal or recycling locations. Include back-up disposal facilities.

B. The following records and disposal documentation must be submitted:
   1. Evidence of lawful disposal or recycling of all wastes generated.
   2. Documentation of underground structures and utilities.

1.7 REGULATORY REQUIREMENTS

A. Contractor is responsible for obtaining any additional permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or levied, except for the permits already obtained by the Owner and attached to these Special Provisions.

B. Comply with all applicable federal, state, and local environmental, safety and health requirements regarding the removal of structures and other site features and recycling or disposal of debris, as applicable

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 UTILITIES

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Owner/Engineer and Utility no less than two days (exclusive of Saturdays, Sundays and legal holidays) in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Owner/Engineer/Utility's written permission.

B. When necessary, the Contractor shall cooperate with representatives of public service companies in order to avoid damage to their structures by furnishing and erecting suitable supports, props, shoring or other means of protection. Fire hydrants adjacent to the work at all times shall be readily accessible to fire apparatus and no material or other obstructions shall be placed within a radius of 10 feet of a fire hydrant.

C. If the Contractor wishes to have any utilities temporarily relocated for his/her convenience other than contemplated by the Owner, the Contractor shall make the necessary arrangement with the Owner and make reimbursement for the cost thereof at his/her own expense.

3.2 CONSTRUCTION METHODS

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
   1. Arrange with utility companies to shut off indicated utilities.
   2. Contractor shall locate all underground site lighting wires, gas and water mains and protect during construction.

B. Sawcut sidewalk and road to the limits shown on the plans.

C. Trench excavation and general excavation required to remove storm drainage pipes, structures, asphalt paving, and concrete paving and curbing shall be in accordance with Section 31 20 00 – Earth Moving.

D. Existing material to be removed by the Contractor shall be removed by such mechanical methods as he may propose, subject to the approval of the Engineer. Methods shall include careful disassembly and cutting of the structures into small, manageable pieces for careful removal if needed.

E. The Contractor shall take all precautions and do such work as may be necessary to prevent damage to the completed portions of any new construction and existing structures to remain, due to his removal operations. Any damage to any existing structures to remain shall be repaired, prior to final payment, at the Contractor’s expense.

F. Plug and abandon pipes to remain as indicated on the plans.

G. Assess the existing 4.5’ H x 6.5’ W stone masonry box culvert on Villa Avenue and remove sediment and debris if necessary.

H. Promptly and properly manage all debris as the demolition progresses. Construct and/or prepare material staging/stockpile areas at locations approved by the Engineer.

3.3 BITUMINOUS CONCRETE AND CONCRETE PAVEMENT/CURB REMOVAL

A. Remove bituminous concrete pavement within Limit of Work as indicated on the Drawings.

B. Pavement reclamation is not allowed.

3.3 DISPOSAL OF MATERIALS AND DEBRIS

A. Legally dispose of or recycle all materials from removal as well as equipment and other materials that are within the limits of removal. Provide evidence that the demolition materials have been received at a legal disposal, recycle, reuse or salvage location. Such proof may include truck weigh slips from an approved disposal facility or documentation of transfer of title. Transport of all materials off site shall be in accordance with applicable Department of Transportation Regulations. All materials leaving the site shall become the property of the Contractor.

END OF SECTION 02 41 13

SECTION 03 41 40 – PRECAST CONCRETE ENDWALL

PART 1 – GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall include furnishing and installing concrete endwall to the dimensions and details shown on the plans and shall conform to Section 5.05 – Endwall of Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

1. Section 31 20 00 – Earth Moving
2. Section 33 40 00 – Storm Drainage Utilities

1.4 SUBMITTALS

A. Submittals shall be in accordance with Subsection 5.05.03 – Construction Methods: Submittal of Section 5.05 of the Standard Specifications.

PART 2 – PRODUCTS

A. The materials to be used for the work under this section shall be those indicated on the Contract Drawings and as specified under Subsection 5.05.02 – Materials of Section 5.05.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

A. The construction methods for the work under this item shall conform to the details shown on the Contract Drawings and as described in Subsection 5.05.03 – Construction Methods of Section 5.05

END OF SECTION 03 41 40

SECTION 31 10 00 – SITE CLEARING

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 WORK INCLUDED

A. This Section includes the following:

1. Clearing and grubbing
    a. Felling of trees including removal of stumps, roots, and other debris.
    b. Removing shrubs, grass, weeds, and other understory vegetation.
2. Stripping and stockpiling topsoil for reuse.
3. Pre-construction tree inspection performed by a certified arborist.
4. Protecting existing vegetation to remain.
5. Construction of protection fencing around trees to remain if deemed necessary by owner or owner's representative
6. Protecting of existing landscaping materials, stone walls, and site improvements not scheduled for clearing, which might be damaged by construction activities.
7. Cleanup and removal of material, labor, tools, machinery and processes once construction is completed.
8. Legal disposal of cleared materials including trees and materials generated during clearing and grubbing.
9. Site clearing shall not commence until erosion and sediment controls are in place. Installation of temporary erosion and sediment control shall be coordinated with Section 01 57 13.

B. Related Section

Work shall be coordinated with the following sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control
2. Section 01 89 13 – Site Preparation Performance Requirements
3. Section 02 20 10 – Construction Staking and Test Pits
4. Section 02 41 13 – Selective Site Demolition
5. Section 31 20 00 – Earth Moving
6. Section 31 23 40 – Water Control and Flood Contingency Plan
7. Section 32 30 10 – Site Restoration

1.3 DEFINITIONS

A. Reasonable and reasonably: When used in this specification is intended to mean that the conditions cited will not affect the establishment or long term stability, health or growth of the plant. This specification recognizes that plants are not free of defects, and that plant conditions change with time. This specification also recognizes that some decisions cannot be totally based on measured findings and that profession judgment is required. In cases of differing opinion, the Owner's Representative expert shall determine when conditions within the plant are judged as reasonable.

B. Shrub: Woody plants with mature height approximately less than 15 feet.

C. Tree and Plant Protection Area: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and defined by a circle centered on the trunk with each tree with a radius equal to the crown dripline unless otherwise indicated by the owner's representative.

D. Tree: Single and multi-stemmed plants, with anticipated mature height approximately greater than 15 feet or any plant identified on the plans as a tree.

E. Topsoil: Friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, without weeds, roots, and other objectionable manner.

1.4 REFERENCES

A. This Section includes the following: The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

B. The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that the requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.

1. ANSI A 300 (Part 5) – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, most current editions.
2. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign Il, most current edition.

1.5 MATERIAL OWNERSHIP

A. Except for stripped topsoil that will be reused on site or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 PROJECT CONDITIONS

A. Salvable Improvements: If needed carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

B. Utility Locator Service: Notify utility locator service, "Call Before You Dig" at 1-800-922-4455 for area where Project is located prior to site clearing. Perform test pits to evaluate water and gas line conflict, refer to Section 02 20 10 – Construction Staking and Test Pits.

C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place as specified under Section 31 10 00 – Site Clearing.

1.7 QUALITY ASSURANCE

A. Codes and Standards: State and local laws and code requirements shall govern the hauling and disposal of trees, shrubs, stumps, roots, rubbish, debris and other matter.

B. Workmanship: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section

C. Certified Arborist: Shall be certified through the International Society of Arboriculture. Arborist shall have appropriate training, experience and knowledge as evidenced by successfully completing a standardized application and testing process. Contractor shall check required permits, licenses and ISA arborist credential. Certified Arborist shall have insurance, including proof of liability for personal and property damage, and workman's compensation.

1. All pruning, branch tie back, tree removal, root pruning, and fertilizing required by this section shall be performed by or under the direct supervision of ISA Certified Arborist Submit aforementioned individual's qualifications for approval by the Owner's Representative.

2. Arborist shall check for dead, dying or diseased trees which may be subject to accidental disturbance during construction. Such trees will be flagged for removal, and removed by the Contractor prior to the start of construction.

PART 2 - PRODUCTS

2.1 Products and materials to be used for the work shall be as specified below or as indicated on the Contract Drawings and approved by the Engineer

2.2 SOIL MATERIALS

A. Stripped and stockpiled topsoil meeting the specifications shall be re-used, salvaged topsoil exceeding the quantity required under the Contract shall be disposed of at Contractor's expense.

2.4 TREE PROTECTION

A. Plastic Mesh Fence: Heavy - duty orange plastic mesh fencing fabric 48 inches wide. Fencing shall be attached to metal "U" or "T" post driven into the ground of sufficient depth to hold the fabric solidly in place with out sagging. The fabric shall be attached to the post using attachment ties of sufficient number and strength to hold up the fabric without sagging. The Owner's Representative may request, at any time, additional post, deeper post depths and or additional fabric attachments if the fabric begins to sag, lean or otherwise not present a sufficient barrier to access.

B. Submit product data for approval.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to be removed or relocated by wrapping orange plastic ribbon around the trunk. Obtain the Owner's Representative's approval of all trees and shrubs to be removed.

C. Layout the limits of vegetation to remain by flagging all trees and shrubs with white plastic ribbon tied completely around the trunk of each tree and on a prominent branch for each shrub. Obtain the Owner's Representative's approval of all trees and shrubs to remain.

D. Notify the Owner's Representative in writing of any conditions that may impact successful completion of the work.

E. Prior to any construction activity install all tree protection fencing if necessary.

F. All existing ditches, waterways, drainage structures, and culverts shall be cleaned of obstructions resulting from construction operations.

G. All excavations made below the proposed subgrade surface by the removal of trees, stumps, etc. shall be filled with suitable material, which shall be compacted thoroughly in accordance with the provisions governing formation of embankments specified in the CTDOT Standard Specifications.

H. The locations of all utilities shown on the contract documents are to be considered approximate. The contractor shall notify Call Before You Dig at least one week prior to the commencement of construction activities. Refer to Section 02 20 10 – Construction Staking and Test Pits for evaluation of potential water and gas line conflicts requirements.

3.2 PROTECTION

A. Protect the Tree and Plant Protection Area at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance. Notify the Owner's Representative of any spills, compaction or damage and take corrective action immediately using methods approved by the Owner's Representative.

B. Erect and maintain temporary fencing around drip line of trees to remain before starting site clearing. Remove fence when construction is complete.

C. Do not excavate within dripline unless otherwise indicated.

D. Vehicles of any kind shall not park beneath drip line of existing trees.

E. Storage of any material shall not take place beneath drip lie of existing trees.

3.3 TREE REMOVAL

A. Remove trees, shrubs and stumps within the work area as necessary to perform the proposed site improvements. Only trees approved for removal shall be removed.

1. Tree and shrub removal shall be conducted in a manner so as to avoid damage to those trees and shrubs which will remain.

2. Do not cut or damage trees or shrubs outside of the Contract limit lines prior to approval. Damage outside the Contract limit lines caused by the Contractor's operations shall be corrected at the Contractor's expense.

3. All trees shall be calipered at 4 and one-half feet above existing grade prior to removal. All trees shall be "topped" and "limbed" previous to felling unless otherwise directed by the Engineer.

4. In areas of major construction, the stumps and roots of all trees designated for removal shall be grubbed and excavated to a depth of 3 feet below the ground surface except in areas of fill greater than 3 feet, where such trees may be cut flush with the ground surface.

B. Tree branches of trees to remain that interfere with the construction may be tied back or pruned to clear only to the point necessary to complete the work.

C. Air pollution caused by dust and dirt shall be controlled, complying with governing regulations.

D. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in accordance with the provisions governing formation of embankments specified in the CTDOT Standard Specifications.

3.4 TOPSOIL STRIPPING AND STOCKPILE

A. Remove sod and grass before stripping topsoil.

B. The site contractor shall strip, screen and stockpile all topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials, minimize sediment damage, and not obstruct natural drainage. While in stockpile, the material shall be sampled and tested by the contractor for gradation and organic content. The site contractor shall amend and blend organic material as needed prior to placement. Following every 300 cubic yards of placement, the soil shall be retested by the site contractor and amended as required.

C. Stockpile topsoil in storage piles in areas indicated or directed for reuse as part of Section 32 3 10 – Site Restoration. No soil stockpile shall exceed ten (10) feet in height.

D. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil in locations required by the construction manager. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

E. All topsoil stockpiles shall be protected from sediment transport by surface roughening, watering, and perimeter silt fencing.

F. Any topsoil stockpile remaining longer than 30 days shall be seeded with a sterile temporary cover or the approved specified final seed mixture.

G. Where trees and shrubs are indicated to remain, stop topsoil stripping a sufficient distance from dripline to prevent damage to main root system.

H. Upon completion of Project or as approved by Owner or Owners Representative, remove surplus subsoil and topsoil from site. Grade stockpile area as necessary for planting or seeding.

3.5 DAMAGE OR LOSS TO EXISTING PLANTS TO REMAIN

A. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Owner's Representative. Damaged trees or plants shall be replaced in kind by the Contractor at their own expense. Trees shall be replaced with a tree of similar species and of equal size or 6 inch caliper which ever is less. Shrubs shall be replaced with a plant of similar species and equal size or the largest size plants reasonably available which ever is less. Where replacement plants are to be less than the size of the plant that is damaged, the Owner's Representative shall approve the size and quality of the replacement plant.

1. All trees and plants shall be installed per the requirements of Specification Section 32 90 00 – Planting.

B. Plants that are damaged shall be considered as requiring replacement or appraisal in the event that the damage affects more than 25 % of the crown, 25% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard. Trees and shrubs to be replaced shall be removed by the Contractor at his own expense,

1. The Owner's Representative may engage an independent arborist to assess any tree or plant that appears to have been damaged to determine their health or condition

C. Any remedial work on damaged existing plants recommended by the consulting arborist shall be completed by the Contractor at no cost to the owner. Remedial work shall include but is not limited to: soil compaction remediation and vertical mulching, pruning and or cabling, insect and disease control including injections, compensatory watering, additional mulching, and could include application of tree growth injections.

D. Remedial work may extend up to two years following the completion of construction to allow for any requirements of multiple applications or the need to undertake applications at required seasons of the year.

3.6 CLEANUP AND DISPOSAL

A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed.

B. Disposal: Remove surplus excavation and soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

C. Remove and dispose of all debris and trash in a legal manner off site. Burning of cleared and grubbed materials is not allowed within the property limits.

1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

D. Cleared and grubbed items shall be removed from the site and satisfactorily disposed of in accordance with local regulations.

E. The town will not take ownership of or store any surplus soil materials. Any need to establish an offsite waste storage area (WSA) shall be the sole responsibility of the Contractor and will not result in any additional fee to the town.

END OF SECTION 31 10 00

SECTION 31 20 00 – EARTH MOVING

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 WORK INCLUDED

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

1. Preparing subgrade for slabs-on-grade, walks, pavements, lawns and grasses and exterior plantings.
2. Preparing subgrade for temporary access route, anti-tracking pad and permanent maintenance access road.
3. Processed aggregate base for footings, pavement repairs, concrete sidewalks, etc. as indicated on the Contract Drawings.
4. Excavating and backfilling for utility trenches and storm drainage structures.
5. Wetland creation excavation and earth moving operations as necessary to the limits shown on the plans, profile, and cross section drawings to construct the proposed wetland system, including but not limited to wetland cells and riprap filter spillway.
6. General excavation and backfill for site improvements as noted on the plans.
7. Soil compaction control.
8. Clean fill from off-site sources, if required.
9. Transport and legal removal of excess materials off-site, if required.
10. Legal disposal of excess or unsuitable materials off-site, if required.

1.4 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall not commence prior to the work of the following sections:

1. Section 01 57 13 – Temporary Erosion and Sediment Control
2. Section 01 89 13 – Site Preparation Performance Requirements
3. Section 02 20 10 – Construction Staking and Test Pits
4. Section 31 10 00 – Site Clearing

Work shall be coordinated with the following sections:

5. Section 02 41 13 – Selective Site Demolition
6. Section 32 12 16 – Asphalt Paving
7. Section 32 13 13 – Concrete Paving and Curbing
8. Section 32 30 10 – Site Restoration

9. Section 33 40 00 – Storm Drainage Utilities

1.5 DEFINITIONS

A. Fill: General term for soil materials used to raise existing grades.

B. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

C. Backfill: General term used for soil material used to fill an excavation.

1. Initial Backfill: Backfill placed over excavated subgrade, beside and over pipe in a trench, including haunches to support sides of pipe.

2. Final Backfill: Backfill placed over initial backfill to fill a trench.

D. Base Course: Course placed between the subbase course and hot-mix asphalt paving.

E. Bedding Course: Initial Backfill placed over the excavated subgrade in a trench before laying pipe.

F. Sand and Gravel: Fill placed over the excavated subgrade before placing crushed stone slab-on-grade base course.

G. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill per Section 2.07 and Article 2.02.03.

H. Drainage Course/Crushed Stone: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

I. Structural Fill: Fill of specified quality placed over the excavated subgrade in the building area, exterior foundation wall backfill, support for slabs and sidewalks, and outside of the zone of crushed stone backfill.

J. Ordinary Fill: General fill and backfill placed outside the limits of Structural Fill, Sand and Gravel, and Crushed Stone.

K. Free Draining Material: material per Section 2.08, Article M.02.07 modified as defined under "Products" section.

L. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

M. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, free draining material, or topsoil materials.

N. Proof-roll: The application of compactive energy to subgrade for the geotechnical engineer's evaluation of suitability of subgrade for bearing.

O. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

P. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

Q. Suitable Material: any material whose composition is satisfactory for use as fill. Any mineral (inorganic) soil, blasted or broken rock and similar materials of natural or man made (i.e. recycled) origin, including mixtures thereof, are considered suitable materials. Determinations of whether a specific natural material is suitable shall be made by the Engineer on the above basis.

1. Recycled materials that the Engineer has evaluated and approved for general use shall be considered to be suitable material subject to the conditions for use. In general the use of recycled materials must be sanctioned by NYSDEC, usually in the form of a Beneficial Use Determination (BUD).

R. Unsatisfactory Soils: Materials including, but not limited to, the following: soil containing ice, snow, roots, sod, rubbish or other deleterious or organic matter; materials non-conforming to the gradations specified for each soil material and not accepted by the Geotechnical Engineer or Owner's representative; materials with a gradation approved by the Geotechnical Engineer or Owner's representative, but that are too saturated to be reused. For subgrades exposed below new foundations, Unsatisfactory Soils include soils that were placed historically by unnatural methods (by man), and not placed and compacted in a quality-controlled manner with documentation, and native undisturbed materials that are too loose/weak to directly support new loads: it may be possible to reuse these particular materials through excavation and replacement in compacted, controlled lifts, at the direction of the Geotechnical Engineer.

1.6 PROJECT CONDITIONS

A. Visit the site to review all details of the work and working conditions and to verify dimensions in the field including headroom and interferences from adjacent structures. Notify the Engineer in writing of any discrepancy before performing any work.

B. Examine the substrata of the areas and ascertain the conditions under which earthwork is to be performed/installed. Do not proceed until all unsatisfactory conditions, if any, have been corrected to the satisfaction of the owner.

C. Consult official records of existing utilities, both surface and subsurface, and their connection to be fully informed on all existing conditions and limitations as they apply to this work and its relation to other construction work.

D. Notify utility locator service, "Call Before You Dig" at 1-800-922-4455 for area where Project is located. Do not proceed until clearance is received.

E. Existing Utilities: Locate existing utilities in areas of excavation work. Provide adequate means of support and protection during earthwork operations. Refer to Section 02 20 10 – Construction Staking and Test Pits for additional information on how to locate existing underground utilities in areas of excavation work.

F. Do not start earthwork operations in areas where clearing and grubbing is not complete, except that stumps and large roots may be removed concurrent with excavation.

G. Verify that survey benchmark and intended elevations for work are as indicated.

1.7 QUALITY ASSURANCE

A. Workmanship: all workers shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Testing and Inspection: Contractor shall be responsible to coordinate with an Owner-selected testing agency or laboratory to schedule testing and inspection service required by these specifications and Form 819 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2024 edition, as amended and latest supplements. Payment shall be the responsibility of the Contractor.

1.8 SUBMITTALS

A. Pre-excavation Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

B. Gradation reports of fill materials to be used for the project (prior to delivery of any materials).

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. Materials shall be free from ice, snow, roots, sod, rubbish or other deleterious or organic matter and shall conform to the gradations specified for each soil material.

B. Base Course: Course placed between the subbase and hot mix asphalt per CT DOT Form 819 M.05.01 modified as follows:

1. Under Section M.05, 2. Coarse Aggregate, delete the phrase "the coarse aggregate shall not have a loss of more than 50%" and substitute the phrase "the coarse aggregate shall not have a loss of more than 40%".

C. Subbase Course: Course placed between the subgrade and base course per CT DOT Form 819 M.02.02 Grading "A" and section M.02.06.04 Soundness.

D. Free Draining Material: Course placed on prepared subgrade beneath the topsoil layer in lawn areas designated on the plans. Material shall be per Section 2.08, Article M.02.07 per CT DOT Form 819 modified as follows:

1. Modify Paragraph M.02.07 to delete the phrase "passing the No. 200 mesh sieve" and substitute the phrase "passing the No. 100 mesh sieve".

E. Granular Fill: This material shall be used as a foundation for structures, to replace unstable material in slopes, as a foundation for sidewalks and culverts, in shoulders and elsewhere as indicated on the plans, required by the specifications or ordered by the Engineer. Granular fill shall conform to CT DOT Form 819 Article M.02.01.

F. Ordinary Fill: General fill and backfill placed outside the limits of Structural Fill, Sand-Gravel, and Crushed Stone. Ordinary Fill shall be friable soil, free of rubbish, ice, snow, tree stumps, roots, and other organic matter; no stone greater than 8 inches and maximum percent finer than No. 200 sieve of 25 percent.

G. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe. Bedding Course shall consist of Sand free of silt, clay, loam, and organic matter. Bedding material shall pass a 3/8" sieve, with not more than 10% passing a No. 200 sieve.

H. Crushed Stone: In areas where Crushed Stone is placed in a total layer thickness greater than 8 inches, wrap Crushed Stone with Filter Fabric.

Sieve Size	Percent Passing by Weight
1-inch	100
3/4-inch	90 - 100
1/2-inch	20 - 55
3/8-inch	0 - 15
No. 4	0 - 5

I. Sand and Gravel:

Sieve Size	Percent Passing by Weight
4"	100
No. 4	50 – 85
No. 10	40 – 75
No. 40	10 – 35
No. 200	0 – 8

J. Structural Fill: Shall be provided per project Geotechnical Study. The specification below should only be used if no Geotechnical recommendation is provided.

Sieve Size	Percent Passing by Weight
6"	100
1"	60 – 100
No. 4	35 – 85
No. 10	25 – 75
No. 20	15 – 60
No. 40	10 – 45
No. 100	5 – 25
No. 200	3 – 10

K. Non-woven geotextile/filter fabric: Conform to CT DOT Form 819 Section 7.55 and material Section M.08.01-19.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify and flag structures, utilities, sidewalks, pavements, and other facilities and protect from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations. Maintain and protect existing utilities remaining which pass through work area. Coordinate work with Section 01 89 13 – Site Preparation Performance Requirements and Section 02 20 10 – Construction Staking and Test Pits.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section 31 10 00 – Site Clearing.

C. Protect and maintain erosion and sedimentation controls, which are specified in Section 01 57 13 – Temporary Erosion and Sediment Control, during earthwork operations.

3.2 EXCAVATION – GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered within a tolerance of plus or minus 1 inch. Unclassified excavated materials may include rock and obstructions. Provide additional excavation as required by the geotechnical engineer. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of unsuitable material or obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION

A. Excavate to required elevations and dimensions regardless of the character of surface and subsurface conditions encountered within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

B. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

C. Excavation for walks and pavements: Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

D. Trench Earth Excavation: Excavation of catch basins, pits, manholes, and including the excavation of all trench materials of any kind except as classified as trench rock excavation. No tunneling will be allowed.

E. Excavation for Utility Trenches: Excavate trenches to indicated gradients, lines, depths, and elevations.

F. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

G. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area, refer to Section 31 23 40 Water Control and Flood Contingency Plan.

3.4 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirements of agencies having jurisdiction for all earthwork operations.

B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

C. Slope the sides of excavations over five feet (5') deep to the angle of repose of the material excavated, but not steeper than 1½ horizontal to 1 vertical. Where sloping is not possible, either because of space restrictions or stability of material excavated, shore and brace in accordance with requirements of authorities having jurisdiction. In addition, provide 5' high snow fence around these areas as protection. Temporary slopes should be covered with plastic sheeting or other suitable cover where necessary to prevent the surface from drying or eroding.

D. Maintain sides and slopes of excavation in a safe condition until completion of backfilling, by scaling, benching, shelving, or bracing.

E. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfilled excavations, and when sides or excavations are subject to vibrations from vehicular traffic or the operation of machinery, or from any other source.

F. Provide minimum requirements for trench shoring and bracing to comply with ANSI A10.1 "Safety for Building Construction", and with local codes and authorities having jurisdiction.

3.5 SUBGRADE EVALUATION

A. Geotechnical engineer must be present for subgrade evaluation. Notify the Geotechnical Engineer at minimum 5 days prior to subgrade preparation.

B. The geotechnical engineer shall observe the reaction of the subgrade during proof-rolling and evaluate suitability for foundation bearing. Proof-roll subgrade with 10 passes of a vibratory drum roller weighing at least 10,000 pounds at the drum or other approved equipment to identify soft pockets and areas of excess yielding. Soft pockets and zones of yielding shall be excavated and proof-rolled again. Do not proof-roll wet or saturated subgrades.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation or change in Contract Time.

D. Landscape and lawn areas are to be constructed in areas utilized during construction for construction access and material storage. These areas are not considered suitable for landscape or lawn construction until subgrade conditions are properly decompacted.

E. Preparation of subgrade operations is to be performed in conditions free of mud, frost, snow, and ice.

F. Prior to the commencement of subgrade preparation, the Geotechnical Engineer shall be notified of any potential unsuitable soil conditions and a determination made as to the acceptable nature of the subgrade soils.

3.6 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings as directed by the geotechnical engineer. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used in lieu of structural fill when approved by Engineer, without additional compensation or change in Contract Time.

B. Fill unauthorized excavations under other construction or utility pipe as directed by the Engineer, without additional compensation or change in Contract Time.

3.7 STORAGE OF SOIL MATERIALS AND PROTECTION OF SUBGRADE

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust and for protection from precipitation.

B. Dewater to maintain water at least two feet below bottom of all excavations.

C. Protect all subgrade soils. Excavate disturbed subgrade and backfill in accordance with specifications at Contractor's expense.

D. Excavate soil and all other materials required to accommodate foundations, slabs, paving and site structures, and construction operations.

E. Do not excavate to full depth when freezing temperatures may be expected unless subgrade is protected from freezing or footings or slabs can be placed immediately after excavation is completed and are protected from freezing.

F. Maintain safe and stable banks.

G. Excavate in a manner that will not disturb existing foundations. Plans for excavating near existing foundations shall be submitted to the Engineer for approval prior to beginning such excavation.

H. Correct unauthorized excavations at no additional cost to the Owner or change in Contract Time.

I. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.8 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Inspection, testing, approval, and recording locations of underground utilities.

C. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Install warning tape directly above utilities, 6" above storm sewer.

3.9 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

3.10 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.11 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials as indicated on the plans and as specified in CT DOT Form 819. Compaction shall be performed in accordance with the following:

Minimum compaction for fill and backfill, based on percentage of maximum dry density (as determined by ASTM D1557 or AASHTO T-180 (Modified Proctor), is:

Below Structures	-	95%
Behind Retaining Walls	-	92%
Pavement Base/Subbase	-	95%
Below Pavement Subbase	-	95%
Areas of General Landscaping and At Lawn areas	-	90%

Loose lift thickness for Fill and Backfill and the minimum number of passes of compaction equipment are summarized on the following table:

Compaction Method	Maximum Stone Size	Maximum Loose Lift Thickness		Minimum Number of Passes	
		Below Structures and Pavement	Less Critical Areas	Below Structures and Pavement	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4"	6"	8"	6	4
Hand-operated vibratory drum rollers weighing at least 1,000#	6"	8"	10"	6	4
Light vibratory drum roller, minimum dynamic force 3,000# per ft. of drum width	6"	10"	14"	6	4
Medium vibratory drum roller, minimum dynamic force 5,000# per ft. of drum width	8"	12"	18"	6	4
Large vibratory drum roller, minimum dynamic force 8,000# per ft. of drum width	10"	16"	24"	6	4

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure. Uneven backfill outside foundation walls are permitted after slabs or suitable bracing are installed at the tops of the walls.

3.12 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Grading: Slope grades to direct water away from structures and to prevent ponding. Finish sub-grades to required elevations within the following tolerances:

1. Lawn or Unpaved Area: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus ½ inch.

3.13 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase and base course under pavements and walks as follows:

1. Shape subbase and base course to required crown elevations and cross-slope grades.

2. Compact subbase and base course as specified in Section 3.11.

3.14 DRAINAGE COURSE

A. Place free draining course on subgrades free of mud, frost, snow, or ice.

1. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as specified.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: The Contractor will engage an Owner-qualified independent geotechnical engineer and/or testing agency to perform field quality-control testing.

B. Allow geotechnical engineer and/or testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: Footing subgrades shall be evaluated by the geotechnical engineer for suitability for foundation bearing.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

E. When geotechnical engineer and/or testing agency reports show that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions at no additional compensation or change in Contract Time.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 31 20 00

SECTION 31 23 40 – WATER CONTROL AND FLOOD CONTIGENCY PLAN

PART 1 – GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. The Contractor's attention is specifically directed, but not limited, to the following sections:

- Section 1.10 – Environmental Compliance
- Section 2.19 – Sedimentation Control System
- Section 2.86 – Drainage Trench Excavation, Rock in Drainage Trench Excavation

In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 Provide all labor, materials, tools and equipment, as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

A. The Contractor shall furnish, install, operate and maintain a trench dewatering system. The system shall ensure that the trench excavation and pipe installation is completed in dry conditions. Removal of water saturated soil will not be permitted.

B. The Contractor shall provide any equipment necessary, such as dewatering pumps and settling tanks or basins, to control water flowing into the drainage systems being installed, bypass clean water around the active work area, and treat all turbid pump discharges prior to water reentering adjacent wetlands or watercourse.

C. The contractor shall control flood flows from nearby waterbodies such that damage to the work area is prevented.

D. The Contractor shall provide standby equipment and power supply for maintaining uninterrupted construction dewatering.

E. Contractor shall maintain drainage along Algonquin Road and Villa Avenue during construction operations. Contractor is responsible for handling the flow from existing catch basin by grading to drain, piping, or other means as designed by the Contractor.

F. The Contractor shall comply with all necessary permits from State and local agencies required for operation of the dewatering system, monitoring groundwater, and disposal of dewatering effluent.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

1. Section 01 57 13 – Temporary Erosion and Sediment Controls
2. Section 01 89 13 – Site Preparation Performance Requirements

1.4 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity.

1. To control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

2. Additional dewatering equipment shall be installed as needed to control water flow from nearby waterbodies to prevent damage and disruption to the work area.

3. Work includes removal of equipment/material when no longer needed or relocation during different phases of work to accommodate the proposed construction. All disturbed areas as a result of the described work in this section shall be restored.

4. Contractors must plan their de-watering activities such that they account for increases in water flow due to storms or other events. No separate payment will be made for de-watering measures that are damaged or overwhelmed by significant and sudden increases in the water flow. Contractors must plan for such events. In some instances, water flows may exceed those reasonably expected to be de-watered and the Contractor may be required to suspend work until such time that the water flows return to a manageable level. In the event the work is suspended due to high water, the Contractor will not be compensated for repairs to de-watering measures, but additional days will be added to the schedule, at no additional cost, to offset the days lost to high water.

B. Pump Discharges: All pump discharges shall be routed to a pump discharge settling area to sufficiently settle out suspended sediments prior to water re-entering the watercourse, while also mitigating erosion or scour prior to encountering wetlands or watercourses.

1.5 SUBMITTALS

A. All submittals shall be approved by the Owner's representative prior to commencement of work. Plan approval shall not relieve the Contractor of any of his responsibility for the safety of the work and for the successful completion of the project.

B. The Contractor shall prepare and submit two separate plans prior to the commencement of construction: Water Control Plan to describe their means and methods for controlling of water during construction as well as a Flood Contingency Plan to describe their emergency operation and preparedness plans to the Engineer for review and approval.

C. The Water Control Plan shall provide the Contractor's proposed project and water control phasing and detail on how the Contractor intends to install the drainage system on dry, stable subgrades throughout each phase of construction.

1. The Contractor's Water Control Plan shall be submitted a minimum of two (2) weeks prior to construction and shall show:

i. Describe how dewatering, control, and diversion of water shall be accomplished.

ii. Provide plans, sections, and details showing the arrangement, locations, and details of dewatering sumps and/or pumps, discharge lines, and means of discharge and control of sediment and disposal of water, if applicable.

iii. Any storm drainage discharging into a confined work area from existing or proposed storm drainage pipes shall be diverted or pumped outside the confined areas. Pumps shall be sized by the Contractor to handle the expected flows and be discharged to a stable location. The Contractor shall submit the means and methods of handling storm drainage to the Engineer for approval.

iv. Provide the estimated average and peak dewatering rates, including supporting calculations.

v. Describe method for maintaining uninterrupted construction dewatering and back-up power supply.

vi. Provide manufacturer's specifications for equipment to be used to control water.

vii. Include an overall schedule for dewatering, control, and diversion of water.

2. Proposed revisions to the Water Control Plan throughout the course of construction for any reason must be submitted in writing and approved by the Engineer prior to modification.

3. The Water Control Plan shall be coordinated with the requirements of Section 31 25 00 – Erosion and Sediment Controls, and other specification sections as required.

D. Flood Contingency Plan: This emergency operation plan is designed to provide the Contractor with guidelines during a flood or a threatening flood period in order to protect the surrounding community.

1. The Contractor shall monitor the weather forecasts and plan construction accordingly.

2. If the weather forecasts should indicate the possibility of a major storm system within 24 to 48 hours, the Contractor shall plan for the possibility of flooding at the site and shall remove all equipment, construction materials (i.e., fuels, solvents, hydraulic fluids, etc.) and stockpiles from flood prone areas, and alert the Owner and Engineer of a potential emergency.

3. If the National Weather Service (NWS) forecasts should indicate the possibility of a precipitation event where the equivalent of more than 3-inches of rain within 24 hours has a greater than a 50% chance of occurring, the Contractor shall plan for the possibility of flooding at the site. Also, the Contractor shall notify the Owner and Engineer.

4. In case of flooding within the project limits which can potentially cause damage to the surrounding area, equipment, and materials, the Contractor shall remove all equipment, construction materials (i.e., fuels, solvents, hydraulic fluids, etc.) and stockpiles from the flood prone areas, and alert the Owner of a potential emergency.

5. The Contractor shall maintain sufficient equipment and manpower at the site in order to react to a flooding emergency.

6. Compensation: No additional compensation shall be made to the Contractor for damages resulting from flood or from time lost due to inclement conditions such that Work within the project site is not feasible.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing CT DEEP notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Pre-installation Conference: Conduct conference at Project site with Engineer, Owner's Representatives and/or DEEP Representative.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

A. Description: The Contractor shall investigate and verify existing site conditions, and evaluate the need for, and the type of protection and facilities required. Before commencing construction, the Contractor shall furnish the Engineer with details of the plan and methods he proposes to use for water control, emergency response, and accomplishing the work. The Contractor may use sandbags, inflatable dams, cofferdams, or other types of protective facilities as approved by the Engineer. The furnishing of such plans and methods shall not relieve the Contractor of any of his responsibility for the safety of the work and for the successful completion of the project.

B. Any pumping from within the areas of construction shall be done in such a manner as to prevent the possibility of movement of sediment from within these areas. Any pumped water must be discharged to a temporary discharge settling basin and/or in accordance with the requirements of the Standard Specifications.

C. Unless otherwise provided or directed, all such temporary protective work shall be removed and disposed of in an approved manner when no longer required.

D. The Contractor shall be responsible for the scheduling of work described herein so as not to interfere with any sequence of operations developed for this project. Delays as a result of work required under this specification shall not constitute a claim for an extension of contract time.

E. If changing conditions impede the effectiveness of the water control protocols implemented by the contractor, work will be halted and revisions to the water control scheme will be planned and implemented, with adequate time for the revisions to take effect and reestablish fully dewatered and dry conditions before work can begin again.

F. In the event of precipitation events that are in excess of the capacity of the water control and bypass system, or for any reason the dewatered excavation areas begin to fill with water, work shall be halted until the work area can be fully dewatered and the subgrade fully dried again before work shall continue.

G. The Contractor is responsible to redeploy and revise the water control and dewatering schemes as many times as necessary to comply with these specifications at no additional cost to the Owner. No such changes in will justify a change order for additional funding

H. If the Contractor is unable to work due to wet conditions that resulted in unexpected precipitation in excess of the water control system or for any reason beyond the control of the Contractor, lost time will be added to the Contract period to allow for completion of construction.

I. If the Contractor is unable to work due to wet conditions that resulted from the failure of the water control system, the incorrect installation of said system, or any reason deemed within the control of the Contractor, lost time will NOT be added to the Contract period.

3.2 INSTALLATION

A. Conform to approved submitted plan and all relevant sections of the specifications.

B. Monitor dewatering systems continuously.

C. Protect and maintain temporary erosion and sedimentation controls, replace and/or reinforce as needed.

D. All work shall be performed on dry subgrades; provide an adequate system and operate the system continuously until the proposed work, including but not limited to excavation, filling, and installation of drainage system, is complete or until dewatering is no longer required.

E. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

3.3 COFFERDAMS AND DIVERSIONS

A. The height of any flow diversion, coffer dam, or barrier shall not exceed four (4) feet in height at any location without supporting structural loading calculations prepared and signed by a professional engineer and without written approval by the Owner.

B. The height of any flow diversions and or barriers shall be elected by the Contractor to provide reasonable protection from flooding. At a minimum, any barriers shall be constructed to the height necessary for the diversion flows described above in these specifications, or as otherwise indicated on the Contract Drawings. All such temporary structures or facilities shall be safely designed, extended to sufficient depth and be of

such dimensions and water-tightness so as to assure construction of the permanent work to the limits shown on the plans. Movements or failures of the temporary protection facilities, or any portions thereof, which prevent proper completion of the permanent work, shall be corrected at the sole expense of the Contractor. Additionally, any cleanup associated with such movements or failures shall be completed at the sole expense of the Contractor.

C. Cofferdams will be constructed of clean, inert materials that will have a minimal impact on the work area. Cofferdams constructed of soil or material from the stream will not be used unless specifically directed by the Owner.

D. Acceptable cofferdam materials shall include temporary sandbags/supersacs, concrete jersey barriers, plastic barriers, and other comparable items.

E. The Contractor is responsible to install all cofferdams/diversion structures in a safe and correct manner. Cofferdams must be installed so as to withstand the pressures exerted by the stream flow or ponded water against the cofferdam.

F. Commercial products used as cofferdams (i.e. water structures, temporary dams) shall be installed in accordance with the manufacturer's instructions.

G. The Contractor is permitted to make minor disturbances to the work area as may be required to properly install any cofferdam/diversion system. All disturbances will be limited to only that disturbance necessary to install the cofferdam/diversion system. Cofferdam/diversion system installation must be done in the presence of the Owner's representative.

H. If the Contract conditions call for the use of sand bags, or if the Contractor shall use sand bags to assist with de-watering, the Contractor shall fill the sand bags with clean, washed sand. Soils with fine particles are prohibited. When placed in the flowing water, the sand bags shall not produce visible turbidity.

3.5 DISCHARGE SYSTEM

A. The discharge of water from the pumping operations or diversion of water shall be done so as to prevent erosion of soils and the introduction of sediment to nearby waterbodies.

B. All materials placed for the discharge system are temporary in nature, and shall be removed from the project area upon completion of the dewatering process.

3.6 MAINTENANCE, REMOVAL AND RESTORATION

A. The Contractor shall maintain all water control measures in good operating form until such time that the measures are no longer needed.

B. In the event of damage to the water control system, the Contractor shall repair or replace the measures as soon as possible and prior to commencing work.

C. Upon completion of the work, and approval of the Contracting Officer, the Contractor shall remove all water control measures. The Contractor shall remove all equipment, material or temporary structures from the work site.

D. Any fill placed around the work site to assist in the water control process, shall be removed upon completion of the work. In the event sandbags are used in the water control process, the sand bags will be removed and emptied outside of any waterbody or wetland area.

E. Upon removal of the water control measures, the Contractor shall regrade any disturbed surfaces and restore all areas consistent with the stabilization of the project site as set forth in the Contract Documents.

END OF SECTION 31 23 40

SECTION 32 12 16 – ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Work under this section shall include the production, delivery and placement of a non-segregated, smooth and dense bituminous concrete mixture brought to proper grade and cross section. This section shall also include the method and construction of longitudinal joints.

B. The terms listed below as used in this specification are defined as:

Bituminous Concrete: A concrete material that uses a bituminous material (typically asphalt) as the binding agent and stone and sand as the principal aggregate components. Bituminous concrete may also contain any of a number of additives engineered to modify specific properties and/or behavior of the concrete material. For the purposes of this Specification, references to bituminous concrete apply to all of its sub-categories, for instance those defined on the basis of production and placement temperatures, such as hot-mix asphalt (HMA) or those categories derived from the mix-design procedure used, such as "Marshall" mixes or "Superpave" mixes.

Types of Bituminous Concrete Mix Designations		
Official Mix Designation Designation	English Equivalent Mix Designation	SI Equivalent Mix Designation
HMA S1	Superpave 1.0 inch	Superpave 25.0 mm
HMA S0.5	Superpave 0.5 inch	Superpave 12.5 mm
HMA S0.375	Superpave 0.375 inch	Superpave 9.5 mm
HMA S0.25	Superpave 0.25 inch	Superpave 6.25 mm
Bituminous Concrete Class 1	~	~
Bituminous Concrete Class 2	~	~
Bituminous Concrete Class 3	~	~
Bituminous Concrete Class 4	~	~
Bituminous Concrete Class 12	~	~

Course: A lift or multiple lifts comprised of the same bituminous concrete mixture placed as part of the pavement structure.

Density Lot: All material placed in a single lift and as defined below.

Disintegration: Wearing away or fragmentation of the pavement. Disintegration will be evident in the following forms: Polishing, weathering-oxidizing, scaling, spalling, raveling, potholes or loss of material.

Hot Mix Asphalt (HMA): A bituminous concrete mixture typically produced at 325°F.

Lift: An application of a bituminous concrete mixture placed and compacted to a specified thickness in a single paver pass.

Marshall: A bituminous concrete mix design used in mixtures designated as "Bituminous Concrete Class ( )".

Production Lot: All material placed per day during a continuous daily paving operation.

Quality Assurance (QA): All those planned and systematic actions necessary to provide confidence that a product or facility will perform as designed.

Quality Control (QC): The sum total of activities performed by the vendor (Producer, Manufacturer, and Contractor) to ensure that a product meets contract specification requirements.

Superpave: A bituminous concrete mix design used in mixtures designated as "S*" Where "S" indicates Superpave and * indicates the sieve related to the nominal maximum aggregate size of the mix.

Segregation: A non-uniform distribution of a bituminous concrete mixture in terms of volumetrics, gradation or temperature.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials shall conform to the requirements of Section M.04 in the Standard Specifications (CT DOT Form 819) except that this not being a Connecticut Department of Transportation (CDOT) project there will not be any testing by CDOT. All references regarding CDOT testing shall be deleted and replaced with the material producers and/ or suppliers may be subject to inspecting and testing by the Owner and/ or his representatives.

B. Materials Supply**:** The bituminous concrete mixture must be from one source of supply and originate from one Plant unless authorized by the Owner. The bituminous concrete mixture shall be produced at an approved Connecticut DOT Plant. The Contractor shall provide proof of current DOT plant approval status. Bituminous Concrete plant QC plan requirements are defined in Section M.04.

C. Recycle Option: The Contractor has the option of recycling reclaimed asphalt pavement (RAP) or Crushed Recycled Container Glass (CRCG) in bituminous concrete mixtures in accordance with Section M.04. CRCG shall not be used in the final lift of the surface course.

PART 3 - EXECUTION

3.1 MATERIAL DOCUMENTATION

A. All vendors producing bituminous concrete must have their truck-weighing scales, storage scales, and mixing plant automated to provide a detailed ticket.

B. Delivery tickets must include the following information:

1. Project name printed on ticket.
2. Name of producer, identification of plant, and specific storage bin (silo) if used.
3. Date and time of day.
4. Mixture Designation If RAP is used, the plant printouts shall include RAP dry weight, percentage and daily moisture content. Class 3 mixtures for machine-placed curbing must state "curb mix only".

5. Net weight of mixture loaded into truck (When RAP is used, RAP moisture shall be excluded from mixture net weight).
6. Gross weight (Either equal to the net weight plus the tare weight or the loaded scale weight).
7. Tare weight of truck – Daily scale weight.
8. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
9. Truck number for specific identification of truck.
10. Individual aggregate, RAP, and virgin asphalt high/target/low weights shall be printed on batch plant tickets (For drum plants and silo loadings, the plant printouts shall be printed out at 5 minute intervals maintained by the vendor for a period of three years after the completion of the project).
11. For every mixture designation the running daily total delivered and sequential load number.

C. The net weight of mixture loaded into the truck must be equal to the cumulative measured weight of its components.

D. The Contractor must notify the Owner immediately if, during the production day, there is a malfunction of the weighing or recording system in the automated plant or truck-weighing scales. Manually written tickets containing all required information will be allowed for one hour, but for no longer, provided that each load is weighed on State-approved scales. The Owner reserves the right to monitor the plant's bituminous concrete mixture production for batching and/ or weighting operation.

3.2 TRANSPORTATION OF MIXTURE

A. Trucks with loads of bituminous concrete being delivered to the projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight (GVW).

B. The mixture shall be transported from the mixing plant in trucks that have previously been cleaned of all foreign material and that have no gaps through which mixture might inadvertently escape. The Contractor shall take care in loading trucks uniformly so that segregation is minimized. Loaded trucks shall be tightly covered with waterproof covers acceptable to the Owner. Mesh covers are prohibited. The front and rear of the cover must be fastened to minimize air infiltration. The Contractor shall assure that all trucks are in conformance with this specification. Trucks found not to be in conformance shall not be allowed to be loaded until re-inspected to the satisfaction of the Owner.

C. Truck body coating and cleaning agents must not have a deleterious effect on the transported mixture. The use of solvents or fuel oil, in any concentration, is strictly prohibited for the coating of the inside of truck bodies. When acceptable coating or agents are applied, truck bodies shall be raised immediately prior to loading to remove any excess agent in an environmentally acceptable manner.

3.3 PAVING EQUIPMENT

A. The Contractor shall have the necessary paving and compaction equipment at the project site to perform the work. All equipment shall be in good working order and any equipment that is worn, defective or inadequate for performance of the work shall be repaired or replaced by the Contractor to the satisfaction of the Owner. During the paving operation, the use of solvents or fuel oil, in any concentration, is strictly prohibited as a release agent or cleaner on any paving equipment (i.e., rollers, pavers, transfer devices, hand tools, etc.).

B. Refueling of equipment is prohibited in any location on the paving project where fuel might come in contact with bituminous concrete mixtures already placed or to be placed. Solvents for use in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off the paved or to be paved area; and they shall not be returned for use until after they have been allowed to dry.

C. Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Owner. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam.

D. Rollers: All rollers shall be self-propelled and designed for compaction of bituminous concrete. Roller types shall include steel-wheeled, pneumatic or a combination thereof and may be capable of operating in a static or dynamic mode. Rollers that operate in a dynamic mode shall have drums that use a vibratory or oscillatory system or combination of. The vibratory system achieves compaction through vertical amplitude forces. Rollers with this system shall be equipped with indicators that provide the operator with amplitude, frequency and speed settings/readouts to measure the impacts per foot during the compaction process. The oscillatory system achieves compaction through horizontal shear forces. Rollers with this system shall be equipped with frequency indicators. Rollers can operate in the dynamic mode using the oscillatory system on concrete structures such as bridges and catch basins if at the lowest frequency setting.

E. Pneumatic tire rollers shall be self-propelled and equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 pounds per square inch uniformly over the surface, adjusting ballast and tire inflation pressure as required. The Contractor shall furnish evidence regarding tire size; pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

F. Lighting: For paving operations, which will be performed during hours of darkness, the paving equipment shall be equipped with adequate lighting fixtures approved by the Owner.

3.4 SEASONAL REQUIREMENTS

A. All paving, including placement of temporary pavements, shall be divided into two seasons, In-Season and Extended Season. In-Season paving shall occur from May 1 – October 31, and Extended Season shall occur from November1- April 30. The following requirements shall apply unless otherwise authorized or directed by the Owner:

1. Bituminous concrete mixes shall not be placed when the air or subbase temperature is below 40°F regardless of the season.
2. The Contractor shall not schedule paving operations during the Extended Season without prior approval from the Owner The Contractor shall also provide to the Owner an

"Extended Season Paving Plan" as outlined below as part of the Extended Season approval process:

a. An "Extended Season Paving Plan" shall be submitted to the Owner a minimum of two (2) weeks prior to the Contractor's anticipated paving operations and shall address minimum delivered mix temperature, maximum paver speed, enhanced rolling patterns and the method to balance mixture delivery and placement operations. Extended Season paving shall not commence until the Owner has approved the "Extended Season Paving Plan".

3. The final lift of bituminous concrete shall not be placed between November 1 and April 30. The Owner, at his discretion, may consider a request from the Contractor to allow placing the top course bituminous concrete if it is deemed to be in the best interest of the project.
4. There will be no additional compensation in relation to when bituminous concrete is placed.

3.5 TRANSITIONS FOR ROADWAY SURFACE

A. Transitions shall be formed at any point on the roadway where the pavement surface deviates, vertically, from the uniform longitudinal profile as specified on the plans. Whether formed by milling or by bituminous concrete mixture, all transition lengths shall conform to the criteria below unless otherwise specified.

B. Permanent Transitions: A permanent transition is defined as any transition that remains as a permanent part of the work. All permanent transitions, leading and trailing ends shall meet the following length requirements:

1. Posted speed limit is greater than 35 MPH: 30 feet per inch of vertical change (thickness)
2. Posted speed limit is 35 MPH or less: 15 feet per inch of vertical change (thickness).
3. Bridge Overpass and underpass transition length will be 75 feet either
    a. Before and after the bridge expansion joint, or
    b. Before or after the parapet face of the overpass.
4. In areas where it is impractical to use the above described permanent transition lengths the use of a shorter permanent transition length may be permitted when approved by the Owner.

C. Temporary Transitions: A temporary transition is defined as a transition that does not remain a permanent part of the work. All temporary transitions shall meet the following length requirements:

1. Posted speed limit is greater than 35 MPH
    a. Leading Transitions = 15 feet per inch of vertical change (thickness)
    b. Trailing Transitions = 6 feet per inch of vertical change (thickness)
2. Posted speed limit is 35 MPH or less
    a. Leading and Trailing = 4 feet per inch of vertical change (thickness)

Note: Any temporary transition to be in-place over the winter shutdown period, holidays, or during extended periods of inactivity (more than 7 calendar days) shall conform to the "Permanent Transition" requirements shown above and shall be approved by the Owner prior to implementation.

3.6 SPREADING AND FINISHING OF MIXTURE

A. Prior to the placement of the bituminous concrete, the underlying base course shall be brought to the plan grade and cross section within the allowable tolerance. Immediately before placing the mixture, the area to be surfaced shall be cleaned by sweeping or by other means acceptable to the Owner. The bituminous concrete mixture shall not be placed whenever the surface is wet or frozen. The temperature of the bituminous concrete mixture at time of placement must be between 265°F. to 325°F. except that the minimum temperature will be 290°F. when the mixture is placed during the Extended Season.

B. The mix temperature may be verified by the Owner at the time and location of placement by means of a probe or infrared type of thermometer to confirm conformance with this specification.

C. Placement: The bituminous concrete mixture shall be placed and compacted to provide a smooth, dense surface with a uniform texture and no segregation at the specified thickness and dimensions indicated in the plans and specifications.

When unforeseen weather conditions prevent further placement of the mix, the Owner is not obligated to accept or place the bituminous concrete mixture that is in transit from the plant or already at the project site awaiting placement.

In advance of paving, traffic control requirements as stipulated under the relevant sections of the Contract Documents shall be set up daily, maintained throughout placement, and shall not be removed until all associated work including density testing is completed.

The Contractor shall inspect the newly placed pavement for defects in the mixture or placement before rolling is started. Any deviation from standard crown or sections shown on the plans, or nonconforming to adjacent existing conditions, shall be immediately remedied by placing additional mixture or removing surplus mixture prior to commencing compaction operations. Such defects shall be corrected to the satisfaction of the Owner.

Where it is impractical due to physical limitations to operate the paving equipment, the Owner may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation. Where hand spreading is permitted by the Owner, it shall not relieve the Contractor of his responsibility to comply with all compaction requirements. The Contractor shall use such equipment as may be necessary to ensure proper compaction has been attained in areas of hand spreading without damage to nearby or adjacent structures/amenities or completed work.

D. Placement Tolerances: Each lift of bituminous concrete placed at a uniform specified thickness shall meet the following requirements for thickness and area. Any pavement exceeding these limits shall be subject to removal and replacement. Lift tolerances will not relieve the Contractor from the responsibility of meeting the final designed grades and cross sections.

The Contractor shall provide copies of all bituminous concrete delivery slips to the Owner for each daily section of pavement placed to determine the theoretical thickness of the in place material as follows:

Theoretical Thickness = T/A_a x 0.0575

Where: T = Actual tons in place
A_a = Actual area (SY)

Yield factor for calculation = 0.0575 Tons/ SY/ inch

E. Thickness- When the thickness of the lift of mixture is less than that shown on the plans beyond the tolerances shown in Table A, the Contractor, shall remove the deficient section and replace it with the specified thickness of material of the same class and to the dimensions as specified in the Contract Documents at their own cost

TABLE A - Thickness Tolerances

Mixture Designation	Lift Tolerance
Class 4 and S1	+ ⅜ inch*
Class 1, 2 and 12 and S0.25, S0.375, S0.5	+ ¼ inch*

*There is no negative lift tolerance, the minimum lift thickness shall be equal to the designed thickness indicted on plans.

When requested by the Owner, if quality or thickness is a disputed issue then, the Contractor, will provided pavement cores as another means to confirm the pavement thicknesses at no additional cost to the Owner. If the Contractor does not provide cores within 72 hours from the Owner request, then the Owner reserves the right to hire a third party to provide core samples to verify thickness. The cost of which will be deducted from the Contractor's progress payments and/ or retainage.

F. Longitudinal Joint Construction: All joints shall be straight and true to adjacent improvements. During placement of multiple lifts of bituminous concrete, the longitudinal joint shall be constructed in such a manner that it is located at least 6 inches from the joint in the lift immediately below. The Contractor shall plan his daily paving operation so that each paving length is the full width of area being paved. No exposed longitudinal joint edges will be allowed unless authorized by the Owner. Prior to placing the completing pass (hot side), an application of tack coat must be applied to the exposed edge of the preceding paving pass of bituminous concrete regardless of time elapsed between paver passes. The in-place time allowance described in Sub article "Tack Coat Application" below does not apply to joint construction.

G. Transverse Joints: All transverse joints shall be formed by saw-cutting a sufficient distance back from the previous run, existing bituminous concrete pavement, or bituminous concrete driveways to expose the full thickness of the lift. Tack coat shall be applied on any cold joint immediately prior to additional bituminous concrete mixture placement.

H. Tack Coat Application: A thin uniform coating of tack coat shall be applied to the pavement immediately before overlaying and be allowed sufficient time to break (set). All surfaces in contact with the bituminous concrete that have been in place longer than 3 calendar days shall have an application of tack coat. The tack coat shall be applied by a non-gravity pressurized spray system that results in uniform overlapping coverage at an application rate of 0.03 to 0.05 gallons per square yard for a non-milled surface and an application rate of 0.05 to 0.07 gallons per square yard for a milled surface. For areas where both milled and un-milled surfaces occur, the tack coat shall be an application rate of 0.03 to 0.05 gallons per square yard. The Owner must approve the equipment and the method of measurement prior to use. The material for tack coat shall not be heated in excess of 160°F and shall not be further diluted. Under no circumstances shall tack coat be applied to surfaces damp to the touch or over standing water. In the event of unforeseen weather conditions, the application of tack coat shall stop until the surface to receive tack coat is dry. The Owner is not obligated to accept any bituminous concrete mixture or tack coat that is placed on/in wet conditions.

I. Tack Coat Application Rate Verification: The Contractor shall provide daily tack coat delivery tickets to the Owner for verification of application rates.

Daily Delivery tickets must include the following information:

1. Project name printed on ticket.
2. Name and location of supplier,
3. Date and time of day.
4. Product type.
5. 1st Gross weight - the loaded scale weight before application of tack coat material.
6. 2nd Gross weight - the loaded scale weight upon completion of tack coat material application.
7. Tare weight of truck – Daily scale weight.
8. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
9. Truck number for specific identification of truck.

J. Compaction: The Contractor shall compact the mixture to an average density between **92.0 and 97.0 percent**. All roller marks shall be eliminated without displacement, shoving, cracking, or aggregate breakage.

The Contractor shall only operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting on concrete structures such as bridges and catch basins. The use of the vibratory system on concrete structures is prohibited. Rollers operating in the dynamic mode shall be shut off when reversing directions.

If the Owner determines that the use of compaction equipment in the dynamic vibratory mode may damage highway components, utilities, or adjacent property, the Contractor shall provide alternate compaction equipment. The Owner may allow the Contractor to operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting.

These allowances will not relieve the Contractor from meeting pavement compaction requirements.

K. Surface Requirements: The pavement surface of any lift shall meet the following requirements for smoothness and uniformity. Any irregularity of the surface exceeding these requirements shall be corrected by the Contractor at his expense:

1. Smoothness – Each lift of the surface course shall not vary more than ¼ inch from a Contractor-supplied 10 foot straightedge. For all other lifts of bituminous concrete, the tolerance shall be ⅜ inch. Such tolerance will apply to all paved areas regardless of placement methods, i.e. hand spreading.
2. Uniformity – The paved surface shall not exhibit segregation, rutting, cracking, disintegration, flushing or vary in composition as determined by the Owner.

3.7 CONTRACTOR QUALITY CONTROL (QC) REQUIREMENTS FOR PLACEMENT

A. The Contractor shall be responsible for maintaining adequate quality control procedures throughout the placement operations. Therefore, the Contractor must ensure that the materials, mixture and work provided by Subcontractors, Suppliers and Producers also meet contract specification requirements.

B. A Quality Control Plan (QCP) shall be submitted for any project with a proposed tonnage greater than 2,500 tons of Bituminous Concrete and/or when the paving operation is scheduled to occur during the Extended Season with prior approval from the Owner.

C. Quality Control Plan: When required, prior to placement, the Contractor shall submit a QCP to the Owner for approval. The QCP shall be submitted at the pre-construction meeting or a minimum 30 days prior to any production or paving. Work covered by the QCP shall not commence until the Owner's comments have been incorporated into the QCP and approved. The QCP shall detail every aspect of the placement process and if required, include a separate section on Extended Season paving as described in Section 4. "Seasonal Requirements". The QCP must address the actions, inspection, minimum frequency of testing/ sampling and testing necessary to keep the production and placement operations in control, to determine when an operation has gone out of control, and to respond to correct the situation in a timely fashion. The QCP shall also include details on when and who will communicate with personnel at the bituminous concrete plant to determine when immediate changes to the production or placement processes are needed, and to implement the required changes.

   Approval of the QCP does not relieve the Contractor of his responsibility to comply with the project specifications and in accordance with the Contract Documents.

D. Quality Control Inspection, Sampling and Testing: The Contractor shall coordinate all quality control sampling and testing, provide inspection, and exercise management control to ensure that bituminous concrete production and placement conforms to the requirements of these specifications.

   1. Records of Inspection and Testing: For each day of placement, the Contractor shall document all test results and inspections on forms approved by the Owner. The document shall be certified by the Quality Control Manager or his representative that the information in the document is accurate, and that all work complies with the requirements of the contract.

3.8 DENSITY TESTING OF BITUMINOUS CONCRETE

A. The Contractor shall monitor and confirm density utilizing a nuclear density gauge of all bituminous concrete placed daily regardless of the quantity. Testing shall be performed by a NETTCP certified HMA Paving Inspector from a certified independent CT testing laboratory. The minimum frequency of testing shall be as follows.

Sub-Lots for Density Testing		
Daily Production Tons	MAT Number of Sub-Lots	JOINT Number of Sub-Lots/ Joint
Less than 500	1 per 100	1per 100
500 to 1,500	10	5
Greater than 1,500	20	10

B. The Contractor shall submit complete laboratory certified test reports and accurate density inspection reports to the Owner within 48 hours following the daily paving operations. The documents shall be submitted in a manner acceptable to the Owner.
C. The Owner shall be responsible for all costs associated with the required density testing.

3.9 CORRECTIVE WORK PROCEDURES

A. Any portion of the completed pavement that does not meet the requirements of the Contract Documents shall be corrected at the expense of the Contractor. Any corrective courses placed as the final wearing surface shall not be less than 1½ inches in thickness after compaction.

B. If pavement placed by the Contractor does not meet the requirements of the Contract Documents, and the Owner requires its replacement or correction, the Contractor shall:

1. Propose a corrective procedure to the Owner for review and approval prior to any corrective work commencing. The proposal shall include:
    a. Limits of pavement to be replaced or corrected, indicating stationing or other landmarks that are readily distinguishable.
    b. Proposed work schedule.
    c. Construction method and sequence of operations.
    d. Methods of maintenance and protection of traffic.
    e. Material sources.
    f. Names and telephone numbers of supervising personnel.
2. In the event the Contractor proposes to perform corrective work during the "Extended Season", the Contractor shall provide an "Extended Season Paving Plan" and adhere to all seasonal requirements within this specification.
3. Perform all corrective work in accordance with the Contract and the approved corrective procedure.

3.10 PROTECTION OF THE WORK

A. The Contractor shall protect all sections of the newly finished pavement from damage that may occur as a result of the Contractor's operations for the duration of the Project. Prior to the Owner's authorization to open the pavement to traffic, the Contractor is responsible for the protection of the pavement from all damage.

NOTE

The Owner may at any time during the course of the work perform QA testing that he deems necessary to assure conformance to these specifications. Any deficiencies found through these actions shall be immediately corrected by the Contractor at no additional cost to the Owner. The cost associated with the re-testing of areas where corrective work was performed will be deducted from the Contractor's progress and/ or retainage

Any pavement deficiencies, corrective work and/ or QC/ QA issues need to be resolved prior to payment for the work under this section.

END OF SECTION 32 12 16

SECTION 32 13 13 – CONCRETE PAVING AND CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Conditions and Supplementary Conditions apply to this Section of the Specifications.

B. The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.2 SUMMARY

A. Work shall include furnishing all materials, labor and equipment to install the following:

1. Concrete Sidewalk
2. Concrete Curbing

B. Related Section

1. Section 31 20 00 – Earth Moving
2. Section 32 12 16 – Asphalt Paving

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete pavement mixture.

C. Shop Drawings: For reinforcing steel and splicing materials.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

C. Workmanship: All workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

D. Testing and Inspection: Owner shall employ and pay for a qualified independent laboratory to perform testing and inspection service required by these specifications and in compliance with the specifications outlined in the CTDOT Form 819.

E. Mockup: The Contractor shall demonstrate conformity of the extruded concrete curb with these specifications and as indicated on the Contract Drawings through the use of mockups with specified finishes and joint treatments in an area approved by the Engineer.

Extruded curb mockups, with approval of the Engineer, may be installed in areas of permanent work, to be ultimately incorporated into the final project.

Mockup sample shall include the following for each curb face and finish specified on the Contract Drawings:

1. A minimum of 10' section of completed curb, including a radius, with tooled joints. Included in this section of the mockup will also be the installation of expansion joints.
2. Samples shall be installed in an area approved by the Engineer and shall be protected throughout the duration of the project.
3. Mockup samples will be used to determine joint sizes, lines, finish, and other design features.
4. The approved extruded curb samples shall be the standard from which the workmanship will be judged.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Plain Steel Wire: ASTM A 82, as drawn.

E. Deformed-Steel Wire: ASTM A 496.

2.2 CONCRETE MATERIALS

A. Materials used for concrete sidewalks shall conform to Article 9.21.02 of Form 819.

B. Concrete shall conform to Article M.03.01 of the Standard Specifications where indicated on the Contract Drawings.

C. Water: Potable

D. Air-Entraining Admixture shall conform to Article M.03.01 of the Standard Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll prepared ¾” aggregate base course below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excessive yielding.

B. Prior to placing any concrete, the Contractor shall notify the Engineer twenty-four (24) hours in advance so that formwork and reinforcing may be inspected. Do not place concrete until inspection has been made or waived.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with Article 6.02 of the Standard Specifications.

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting buildings, concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness to match jointing of existing adjacent concrete pavement.

3.5 CONCRETE PLACEMENT– SIDEWALK

A. Comply with Article 9.21 of the Standard Specifications.

1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.6 CONCRETE PLACEMENT – CONCRETE CURBING

A. Comply with Section 8.11 of CT DOT Form 819.

B. Expansion joints shall continue through face of curb.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 305.1 for cold-weather protection.

C. Comply with ACI 306.1 for cold-weather protection.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

3.8 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.

C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 32 30 10 – SITE RESTORATION

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 SUMMARY

Work under this section includes providing all materials, equipment, and services necessary to restore the site after construction including but not limited to the restoration of all temporary anti-tracking pads, temporary construction route and permanent maintenance access road, any work necessary to assist in the completion of topsoil, plants and wetlands as specified in their respective sections, the preconstruction and postconstruction condition survey and any other work incidental to the full repair of construction disturbance areas, and restoration of the site.

1.4 RELATED SECTIONS

Work shall be coordinated with the following sections:

1. Section 01 89 13 – Site Preparation Performance Requirements
2. Section 31 20 00 – Earth Moving
3. Section 32 12 16 – Asphalt Paving
4. Section 32 13 13 – Concrete Paving and Curbing
5. Section 32 71 00 – Constructed Wetlands
6. Section 32 91 13 – Topsoil
7. Section 32 93 00 – Plants

1.5 QUALITY ASSURANCE

A. Workmanship: all workers shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. The Owner reserves the right to test and reject for cause any material not meeting material specifications by tests in accordance with methods described in each relevant section of these Special Provisions. Costs for these tests shall be borne by the Contractor [subcontractor].

C. No substitution prior to approval will be accepted. If specified material is not obtainable, submit proof of no availability to Engineer, together with proposal for use of equivalent material.

D. All welding shall be performed by welders, tackers, and welding operators who have been qualified in the last six (6) months by test as prescribed in the Code for Welding in Building Construction of the American Welding Society.

E. Inspection: The Owner may inspect any and all materials before installation, for compliance with requirements specified in these Special Provision and Contract drawings. Remove rejected material immediately from project site.

F. Pre-installation/work Conference: Conduct conference with Owner/Engineer/Contractor/Local Authorities at Project site.

PART 2 - PRODUCTS

2.1 INSTALLATION - GENERAL

A. All items shall be assembled and erected per manufacturer's recommendation and located as shown on the Contract Drawings and/or as directed by the Engineer.

2.2 CLEANING

A. Clean up debris and unused material and remove it from the site.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify the work completed in the following sections are completed and satisfies the requirements:

1. Section 31 20 00 – Earth Moving
2. Section 32 12 16 – Asphalt Paving
3. Section 32 13 13 – Concrete Paving and Curbing
4. Section 32 71 00 – Constructed Wetlands
5. Section 32 91 13 – Topsoil
6. Section 32 93 00 – Plants

If the work of the above sections does not meet specifications Contractor shall begin corrective measures. Any work to be corrected shall be at the Contractor's expense. The contract will not be accepted until a satisfactory final product has been produced.

3.2 SITE CLEANING AND REPAIR

A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition.

3.3 CLEANUP AND PROTECTION

A. During restoration work, keep pavements clean and work area in an orderly condition.

B. Protect restoration work and materials from damage due to operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged restoration work as directed.

C. Compaction: The Contractor shall keep all equipment, vehicular and pedestrian traffic off areas that have been seeded to prevent excessive compaction and damage to young plants. Where such compaction has occurred, the Contractor shall rework the soil to make a suitable seedbed; then re-seed and mulch such areas with the full amount of the specified materials, at no extra charge to the Owner.

D. This work will not be considered complete until all cleanup operations are complete. This shall include the removal of all debris resulting from the restoration operation. The Contractor shall be required to shape, grade, and establish vegetative cover in accordance with the specifications on all areas disturbed outside the normal limits of the construction.

E. The Contractor shall care for restored areas until all work on the entire contract has been completed and accepted. When necessary, such care shall consist of providing protection against traffic by warning signs or barricades

3.4 PRE-CONDITION SURVEY AND MONITORING

A. This work shall involve the video documentation of the pre-existing conditions for all roads adjacent to the proposed work prior to commencement of construction activities. Monitoring the site during the construction activities at the direction of the Engineer. The work shall involve the use of still photography and high resolution video equipment for the purpose of recording the roads, sidewalks and any portions deemed necessary and shall denote any pre-existing defects such as cracks, separations, settlement, holes, and/or other typical conditions or deteriorations often present on roads caused by vibrations. Where applicable, the work shall also include the review of parking areas, retaining walls, and other structures accessory to the location. Where defects are noted, such notations shall indicate severity or extent of condition (i.e., crack width, length, depth, etc.).

3.5 POST-CONSTRUCTION SURVEY AND REPAIRS NEEDED

A. This work shall involve the video documentation of the post-construction conditions for all roads adjacent to the proposed work. The work shall involve the use of still photography and high resolution video equipment for the purpose of recording the roads, sidewalks and any portions deemed necessary and shall denote any post-construction defects such as cracks, separations, settlement, holes, and/or other typical conditions or deteriorations often present on roads caused by vibrations.

B. All areas surveyed under Pre-Condition Survey and Monitoring Subsection 3.5 shall be re-evaluated after construction is complete in accordance with the above requirements. Any changes in condition or impacts caused by construction shall be repaired at the contractor's expense to the Owner's satisfaction.

3.6 RESTORATION OF PROPERTY

A. During restoration work, Contractor shall repair and restore all gravel and paved driveways/roadways to pre-construction condition or better and to the satisfaction of the property owner.

B. The Contractor will also be required to restore any damaged or disturbed lawn area to the satisfaction of the property owner.

3.7 INSPECTION AND ACCEPTANCE

A. When restoration work is completed, including maintenance, the Owner will, upon request, make an inspection to determine acceptability.

B. When inspected restoration work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by the Owner and found to be acceptable.

C. When the Owner decides that any area that has been restored fails for any reason to produce a satisfactory restored area after a suitable period of time has elapsed, the Contractor shall correct such areas in the same manner as specified in the contract until restoration has been completed to a satisfactory standard. Any work to be corrected shall be at the Contractor's expense.

END OF SECTION 32 30 10

SECTION 32 71 00 – CONSTRUCTED WETLANDS

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements.

1.3 The work shall be consistent with the latest "Connecticut Stormwater Quality Manual" published by the Council on Soil and Water Conservation in Collaboration with Connecticut Department of Energy and Environmental Protection,

1.4 In case of conflict between these Special Provisions and the aforementioned standards, these Special provisions shall take precedence and shall govern.

1.5 WORK INCLUDED

Work under this section includes providing all materials, equipment, and services necessary to furnish and deliver work as shown on the Drawings, as specified, and as required by job conditions including, but not limited to the following:

1. Construction of a shallow wetland system as indicated on the Contract Drawings.

1.6 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall be coordinated with the following sections:

1. Section 02 20 10 – Construction Staking and Test Pits
2. Section 31 20 00 – Earth Moving
3. Section 32 30 10 – Site Restoration
4. Section 32 91 13 – Topsoil
5. Section 32 93 00 – Plants
6. Section 35 41 20 – Riprap Filter Spillway

1.7 DEFINITIONS

A. Stormwater Wetland: Man-made wetland systems that incorporate marsh areas and permanent pools (cells) to provide treatment and attenuation of stormwater flows.

B. Shallow Wetland: Shallow wetland systems, also referred to as shallow marsh wetlands, consist of aquatic vegetation with a permanent pool ranging from 6 to 18 inches during normal conditions.

C. Riprap Filter Spillway: Used to separate wetland cells to enhance plug flow conditions across wetland.

D. Outlet Control: Manages runoff into and out of structural stormwater wetland.

1.8 JOB CONDITIONS

A. Prior to construction the work described under Section 02 20 10 – Construction Staking and Test Pits shall take place. Exploratory test pits (two as indicated on the plans) and field tests are required to evaluate groundwater elevation and soil permeability.

B. Soil testing may be required by the Engineer or Owner to determine the suitability of the soils for plant growth and to classify the permeability (in terms of Hydrologic Soil Group) of proposed wetland area.

C. Minimize soil compaction and restore soils that were compacted due to construction activities. When soils are overly compacted, the soil pores are destroyed and permeability is drastically reduced.

D. If required, restoring soils compacted as a result of construction activities typically requires modification of the underlying soils to improve soil quality to support vegetation. The soil should be treated by scarification, ripping (tilling), or use of a shatter-type soil aerator to a depth of 9 to 12 inches or more depending on site and soil conditions. Amendment with 2 to 4 inches of topsoil or organic material may be required to improve plant establishment based on soil testing results.

E. Shallow Wetlands rely on a permanent pool or saturated soil conditions and are best suited to areas with poorly drained soils, the area shall fall under the Hydrologic Soil Group (HSG) D classification. Area with HSG A, B, or C classification may require an impermeable liner if the bottom of the system does not intercept groundwater.

1.9 QUALITY ASSURANCE

A. Workmanship: all workers shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Shallow Wetland shall be constructed and graded such that flow through the wetlands is conveyed uniformly across the treatment area. While pathways, channels, or other varied water depths could enhance the aesthetic or ecosystem value of the wetland, they could also cause short-circuiting through the wetland thereby reducing the overall treatment effectiveness. The system shall be uniformly sloped to maximize treatment performance. Individual wetland cells shall be separated by Riprap Filter Spillway, described under Section 35 41 20.

1.10 SUBMITTALS

A. If soil testing is determined to be require by the Engineer or Owner, Contractor shall submit soil test report describing the suitability of the soils for plant growth and the HSG classification of the soil.
   1. Test shall be conducted by the University of Connecticut Soil Testing Laboratory, another university soil testing laboratory, or a commercial soil testing laboratory.
   2. Soil testing shall be in conformance with the Connecticut Stormwater Quality Manual testing requirements for stormwater wetlands.

PART 2 - PRODUCTS

2.1 GENERAL

A. Topsoil and wetland vegetation products shall be as specified in Section 32 91 13 – Topsoil and Section 32 93 00 – Plants.

B. Riprap Filter Spillway material is described under Section 35 41 20.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform evaluation of the site as described in this Section and Section 02 20 10 – Construction Staking and Test Pits to determine suitability of area for shallow wetland construction.

B. Coordinate a pre-wetland construction meeting with the Engineer, Ecologist and Owner before proceeding with work. Make any adjustments necessary to successfully construct the shallow wetland system.

C. Construction of shallow wetland shall be as indicated on the plans or as directed by the Engineer/Ecologist.

D. Perform earthwork as described under Section 31 20 00 – Earth Moving.

E. Vegetation of wetland shall be described under Section 32 20 10 – Site Restoration, Section 32 91 13 – Topsoil, and Section 32 93 00 – Plants.

END OF SECTION 32 71 00

SECTION 32 91 13 – TOPSOIL

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 WORK INCLUDED

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

1. Furnishing and placing topsoil.

1.4 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall be coordinated with the following sections:

1. Section 31 10 00 – Site Clearing
2. Section 31 20 00 – Earth Moving
3. Section 32 30 10 – Site Restoration
4. Section 32 93 00 – Plants

1.5 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation.

C. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Planting (Top) Soil: Topsoil shall consist of natural loam, free from subsoil, obtained from an area which has never been stripped. Topsoil is friable clay loam surface soil found in a depth of not less than 4 inches, and is substantially free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material. Topsoil meeting this definition and the specifications specified below shall be considered suitable for use on-site.

E. Compost: Compost is an organic matter resource with the ability to improve the chemical, physical, and biological characteristics of soils. Compost consists of municipal, farm, and food waste and may include spoiled hay, mushroom substrate, leaves, lawn trimmings, animal manure, food waste, woodchips, and other organic materials. Compost meeting this definition and the specifications specified below shall be considered suitable for use on-site. Compost to be mixed

with topsoil at a rate of 80% topsoil/20% compost (by weight) for all areas where topsoil is to be planted or seeded.

F. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1. Cultivation of all subgrade areas prior to amending is included in this Section.
2. Subgrade soil(s): Subgrade soil shall be free draining and granular, which have been placed resulting from the approved rough grading work and are located in the lawn, tree or shrub planting areas.
3. Prepared, cultivated subsoil shall be demonstrated to be capable of infiltrating water at a minimum rate of 1" per hour prior to placement of planting soils.

G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.6 SUBMITTALS

A. Product data sheets, specifications, performance data, physical properties, and manufacturer's certificates or labels for the following:

1. Fertilizer (if required)

B. Samples (and test report), in the following quantities:

1. Test must be recent and approved prior to delivery of material to the site.
2. Topsoil – provide representative testing to indicate topsoil is in conformance with the specifications specified below. Only topsoil meeting organic content specifications is acceptable.
3. Compost - provide representative testing to indicate compost is in conformance with the specifications specified below. Only compost meeting organic content specifications is acceptable. The following sources are provided:
   a. Connecticut Department of Energy & Environmental Protection – Composting and Organic Recycling sources: https://portal.ct.gov/deep/waste-management-and-disposal/organics-recycling/composting-and-organics-recycling
4. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The Owner's Representative reserves the right to reject, on or after delivery, any material that does not meet these Specifications. The Contractor shall be responsible for recognizing that these critical project materials warrant timely and serious attention, that the testing process to achieve Approved materials should be considered a lead time item, and that under no circumstance shall failure to comply with all specification requirements be an excuse for "staying on project construction schedule."
5. Source of topsoil must be submitted. Only quality material free of contamination shall be used. At the discretion of the Owner or Owner's Representative, additional soil testing for the presence of chemical compounds may be required. All testing shall be at the Contractor's expense.

C. Topsoil shall be free of any invasive species. Contractor to coordinate with owner's representative to inspect topsoil and verify that topsoil is free of any weeds and invasive species prior to importing topsoil to site.

1.7 QUALITY ASSURANCE

A. Contractor is solely responsible for quality control of the Work. The Owner reserves the right to test and reject for cause any material not meeting material specifications by tests in accordance with methods adopted by the Association of Official Agricultural Chemists. Costs for these tests shall be borne by the Contractor [subcontractor].

B. Analysis and standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

C. Soils Testing Laboratory: to be approved by Owner's Representative. Lab shall have ability to make tests and provide soil recommendations.

D. Pre-installation Conference: Conduct conference with Owner/Engineer/Contractor/Local Authorities at Project site.

E. Regulatory Requirements:

1. Comply with laws, regulations, and quarantines for agricultural and horticultural products.

F. The contractor is responsible for meeting the requirements in this Specification, including, but not limited to soil testing, timely submittals, moisture content of soils, compaction, and protection of work. If any areas of soils are installed without adherence to this Specification, the contractor is responsible to correct any and all deficiencies, regardless of the project status, including, but not limited to removal and replacement of soils and pavements, in-situ amendments, monitoring or other actions.

G. Topsoil and Compost Analysis: Furnish soil and compost analysis by a qualified soil-testing laboratory.

1. Report suitability of topsoil for lawn growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver fertilizer, if called for, in sealed waterproof bags showing weight, chemical analysis and name of manufacturer.

B. Acceptance at Site: verify in writing that delivered materials conform to specifications and approved submittals.

C. Storage and Protection:

1. Materials shall be uniform in composition, dry and free flowing. Store materials in dry place, on pallets, off the ground; protect from sun. Store materials in a manner that does not diminish their usability and effectiveness.
2. Protect materials from theft, damage, weather, dirt, oils, grease, and construction activities.
3. Planting soils stored onsite prior to placement shall be stockpiled in windrows less than six feet high and no longer than ten days before placement.

4. Planting soils should be covered during precipitation events to minimize saturated soil conditions. Planting soils may not be manipulated when in a wet or frozen condition, to include planting operations.

1.9 PROJECT CONDITIONS

A. Soil Moisture Content

1. Contractor shall not move, blend or grade soil when moisture content is so great that adequate mixing is not possible as determined by the field soil moisture test, nor when it is so dry that dust will form in the air or that clods will not break readily, nor when it is frozen. Apply water, if necessary, or allow to dry to bring soil moisture between 60% of optimum moisture content and optimum moisture content as determined by ASTM D698 for compaction, grading and plantings.
2. Soil may not be manipulated in any way while in a wet condition, including moving of stockpiles, grading, planting or any other excavation. Contractor is responsible for removal and replacement of any and all soils that were manipulated when wet.
3. Field Soil Moisture Test
    a. Form soil in palm of hand, if soil retains shape and crumbles upon touching, the soil may be worked.
    b. If the soil will not retain shape it is too dry and should not be worked.
    c. If the soil retains shape and will not crumble, it is too wet and should not be worked.
    d. If the soil glistens or free water is observed when the sample is patted in the palm of hand the soil is too wet and should not be worked.

1.10 SEQUENCING AND SCHEDULING

A. Topsoil shall be placed directly upon completed cut and fill slopes whenever conditions and the progress of construction will permit. Coordinate the work of this Section with the respective trades responsible for installing interfacing work to ensure that the work performed is scheduled to minimize damage to lawn areas.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. The existing topsoil material on site is to be stripped, stockpiled, and screened for reuse to the greatest extent possible as described under Section 31 10 00 – Site Clearing.

B. Imported topsoil shall be hauled to the site and stockpiled in locations designated by Owner.

C. Topsoil: Topsoil shall consist of natural loam topsoil with the addition of humus only, and no other soil type, such as a sand or clay soil type, shall be accepted. Topsoil must be free from subsoil, obtained from an area which has never been stripped. It shall be removed to a depth of one foot or less if subsoil is encountered. Topsoil shall be of uniform quality, free from hard clods, stiff clay, hardpan, sods, particularly disintegrated stone, lime, cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks or any other undesirable material. Topsoil shall meet the following requirements:

1. Organic Matter: between 5%-9% organic matter.
2. The pH shall be in the range of 6.0 to 7.5 inclusive.

3. Topsoil shall consist of the following percentages of sand, silt and clay.
    - Rocks, Stone and Gravel (>2.0 mm) <25%
    - Sand (0.05-2 mm) 40%-70%
    - Silt (0.002-0.05 mm) 10%-50%
    - Clay (<0.002 mm) 20% maximum
4. When the topsoil complies with the requirements of the specification but show a deficiency of not more than one percent in organic matter, it may be incorporated when and as permitted by the engineer.
5. Electrical conductivity shall be a maximum of 1.0. mmhos/cm. A higher level would indicate that the salt content is too high to be acceptable.
6. Compost to be mixed with topsoil at a rate of 80% topsoil/20% compost (by weight) for all areas where topsoil is to be planted or seeded. Compost shall be free of debris such as plastics, metal, concrete or other debris and stones larger than 1/2", larger branches and roots and wood chips over 1/2" in length or diameter. Compost shall be a dark brown to black color and be capable of supporting plant growth with appropriate management practices in conjunction with addition of fertilizer and other amendments as applicable, with no visible free water or dust, with no unpleasant odor, and meeting the following criteria as reported by laboratory tests.

D. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

1. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient.
2. Additional loam, if required, shall be fertile, friable, agricultural soil, typical for locality, pH value compatible, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay lumps, stones, and other objects over two (2) inches in diameter, and free from other impurities, plants, weeds and roots.

2.2 SOIL AMENDMENTS

A. Compost shall have a density of 27 – 37 lbs/ft3, organic matter content of >50%, pH 5.5 – 8.0, soluble salts of <6.0 mmhos.

B. Fertilizers, if required, shall be of uniform composition and shall be suitable for accurate application by approved equipment. Fertilizer to be used only if approved by engineer. Fertilizers shall be delivered to the site in their manufacturer's packaging, and shall meet all applicable state or federal laws related to labels. The manufacturer's name, fertilizer formulation and other required information shall be clearly marked on the packaging.

C. When lime is required, the materials shall be ground limestone, hydrated lime or burnt lime. Lime materials shall contain a minimum of 50% total oxides and shall be ground such that 50% passes a #100 mesh sieve and 98-100 % shall pass a #20 mesh sieve. Lime will be incorporated into the top 3"-6" of soil by disking or other suitable means.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify prepared soil base is properly rough graded and ready to receive the work of this Section.

B. Verify trench backfilling has been inspected.

C. Verify substrate base has been contoured and compacted.

D. Beginning of landscaping work means acceptance of existing soil base, and site conditions.

3.2 PREPARATION

A. Loosen subsoil with a subsoiler to a depth of 12 inches.

B. Prepare subgrade to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes in level areas.

C. Screen topsoil to remove stones ¾ inch and larger.

D. Remove foreign materials, debris, weeds, undesirable plants, roots, branches. Remove subsoil contaminated with petroleum products, or other materials, which would inhibit healthy plant growth.

E. Scarify subgrade to depth of four (4) inches where topsoil is scheduled. Scarify areas where equipment is used for hauling and spreading topsoil and has compacted subsoil. No rubber-tired equipment or heavy equipment except for a small bulldozer shall pass over the subsoils (subgrade) after they have been loosened. If the Contractor plans to utilize such areas for any use of heavy equipment, this work should be carried out prior to beginning the process of loosening soils or filling in that area, or it will have to be re-scarified and meet this specification requirement.

F. Saturate soil with water to test drainage.

3.3 PLACING AND TREATING TOPSOIL

A. Place both stockpiled topsoil and additional loam during dry weather; place to a minimum compacted depth of six (6) inches on dry unfrozen subgrade. Place screened topsoil for both sodded and seeded lawn areas. Treat additional loam with ground limestone only if pH adjustment is required and as approved by engineer.

B. Compost to be mixed with topsoil at a rate of 80% topsoil/20% compost (by weight) for all areas where topsoil is to be planted or seeded.

C. Fine grade topsoil, making changes in grade gradual, eliminating rough or low areas. Blend slopes into level areas. Manually spread topsoil close to trees, plants, and building to prevent damage. Roll, fill depressions to ensure positive drainage.

D. Remove any residual roots, weeds, rocks and foreign material while spreading.

E. Remove surplus subsoil and topsoil from site. Leave stockpile areas and site clean and raked ready to receive grass.

F. Apply fertilizer only if required for soil improvement, and as approved by engineer, in accordance with manufacturer's instructions, or testing agency recommendations (if tests are made), within 10 days of seeding, after smooth raking of topsoil and prior to roller compaction.

G. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

H. Mix thoroughly into upper six (6) inches of topsoil.

I. Lightly water to aid the dissipation of fertilizer, if applied.

J. After incorporation of fertilizer or limestone into the soil, fine grade seed/sod bed to remove all ridges and depressions, and the surface cleared of all stones 1/2 inch or more in diameter and all other debris.

K. Establish cover per the Drawings as soon as possible following approval of topsoiling.

3.4 CLEANUP AND PROTECTION

A. During topsoil installation keep the work area clean and in an orderly condition.

B. Protect work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.5 INSPECTION AND ACCEPTANCE

A. When soil placement work is completed, Owner's Representative will inspect to determine acceptability.

B. When inspected topsoil work does not comply with requirements, replace rejected work until re-inspected by Owner's Representative and found to be acceptable. Remove rejected soil and materials promptly from project site.

END OF SECTION 32 91 13

SECTION 32 93 00 – PLANTS

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 WORK INCLUDED

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

1. Installation of trees and wetland plants.
2. Furnishing seed and mulch for the establishment of turf, ground vegetation, trees, wetland plants, and other plantings as indicated on the plans and for all disturbed areas after completion of construction.

1.3 RELATED SECTIONS

1. Section 32 30 10 – Site Restoration
2. Section 32 71 00 – Constructed Wetlands
3. Section 32 91 13 – Topsoil

1.4 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Lawn: Any area seeded with grass seed that will be maintained as mown grass.

D. Mulch: Mulch consists of straw mulch, sphagnum peat, chipped wood or bark and is used to cover soil around planted trees and shrubs for the purpose of retaining moisture, providing a slow release of nutrients, suppressing weeds, and moderating temperatures. Mulch is added as a layer above the soil. Mulch meeting this definition and the specifications specified below shall be considered suitable for use on-site.

1.5 SUBMITTALS

A. Product data sheets, specifications, performance data, physical properties and product sample for the following:

1. Seed mixture: Submit native seed mixtures for approval prior to application of the seed and all empty seed bag labels after application of seed to the Engineer. Species types within Native Seed Mixtures listed below may vary dependent upon season and/ or availability of species' seed.

B. Manufacturer's Certificates or labels from containers certifying that the product meets the specified requirements for the following:

1. Seed mixture, if pre-mixed, also show compliance with State and federal seed laws.
2. Planting materials to be provided by the contractor for all plants and shrubs.

C. Planting Schedule: Indicating anticipated planting dates for each type of planting shall be provided to the Owner at least 10 business days prior to installation.

D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.6 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

C. The Owner reserves the right to reject for cause any material not meeting material specifications.

D. Do not make substitutions. If specified landscape material is not obtainable, submit proof of no availability to Owner, together with proposal for use of equivalent material.

E. Pre-installation Conference: conference with Owner/Engineer/Contractor/Local Authorities at Project site.

F. Inspection: The Owner may inspect trees and plants either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size, and quality. Owner retains right to further inspect trees for size and condition of balls and root systems, insects, injuries and at any time during progress of work. Remove rejected trees or shrubs immediately from project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees before delivery. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.

B. Handle planting stock by root ball.

C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

D. Deliver seed mixture in new, sealed, containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging. Seed in damaged packaging is not acceptable.

E. Deliver fertilizer, if called for, in sealed waterproof bags showing weight, chemical analysis and name of manufacturer.

1.8 WARRANTY

A. The Contractor shall supply the Engineer with all warranties or certificates, or both, furnished with the seed mixture prior to use of the material, if so requested.

B. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.
b. Structural failures including plantings falling or blowing over.

2. Warranty Periods from Date of Substantial Completion:

a. Trees: One year.
b. Ground Cover and Perennial Plants: One year.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.

1. Maintenance Period for Trees: 12 months from date of planting completion.
2. Maintenance Period for Ground Covers and Plants: 12 months from date of planting completion.
3. Seeded Lawns: 90 days from date of Substantial Completion, seeding the area shall have greater than 95% viable coverage of grass.

a. When initial maintenance period has not elapsed before end of planting season, or if lawn is not fully established, the area shall be mulched with straw and maintenance continued next planting season.

1.10 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with the respective trades responsible for installing interfacing work to ensure that the work performed there under is scheduled to minimize damage to lawn areas.

1.11 JOB CONDITIONS

A. Seeding shall be performed when weather and soil conditions are suitable in accordance with locally accepted practice, as specified herein.

B. Seeding dates are as follows: April 1 to June 15 or September 1 to October 31

C. Do not install seed when wind velocity exceeds five (5) mph.

D. Dormant season plantings to be installed between November 1 and March 31, but not while the ground is frozen.

E. Growing season plantings to be installed between April 1 and June 15 or between September 1 and October 31.

PART 2 - PRODUCTS

2.1 TREE MATERIAL

A. General: Furnish nursery-grown trees complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, not root bound, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement. Provide single stem trees except where special form are shown or listed.

B. Root-Ball Depth: Furnish trees with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

C. Refer to contract drawings and planting schedule (Sheet PR-1) for plant species and sizes to be used on site.

D. Provide balled and burlapped or container-grown trees.

E. All plants shall be well watered upon delivery and they will be watered regularly to keep the potting soil damp prior to planting.

2.2 SEED

A. Seed may be mixed on-site by an approved method or pre-mixed by a dealer. If the seed is to be mixed on-site, seed shall be delivered to the site in separate containers for each variety of seed.

B. Grass Seed: Shall be Hart's Triple Team Tall Fescue Blend as supplied by Chas C. Hart Seed Company, 304 Main Street, Wethersfield, CT 06109, p. 860.529.2537, or approved equal.

C. Wetland Seed: Shall be New England Wetmix (Wetland Seed Mix) as supplied by New England Wetland Plants, 14 Pearl Lane, South Hadley, MA 01075, p. 413-548-800, or approved equal.

D. Restoration Seed: Shall be New England Conservation/Wildlife Mix as supplied by New England Wetland Plants, 14 Pearl Lane, South Hadley, MA 01075, p. 413-548-800, or approved equal.

E. The seed mixture is to have no noxious weeds. Other suppliers and seed mixes may be substituted for the above-listed product with the approval of the Ecologist and Owner.

F. Provide fresh, clean, new-crop seed complying with established tolerances for germination and purity in accordance with the U.S. Department of Agriculture Rules and Regulations under the latest edition of the Federal Seed Act. Seed shall be mixed by the dealer and shall be delivered to the site in sealed containers that bear the Dealer's guaranteed analysis.

G. Hydroseeding solution shall consist of the following components:

Grass seed	6 lbs / 1,000 sq. ft.
Cellulose mulch	32 lbs / 1,000 sq. ft.
Fertilizer	15 lbs / 1,000 sq. ft.
Superphosphate	20 lbs / 1,000 sq. ft.

H. If seeding is to be done after September 30, increase the seeding rate by 50% over specified rates.

I. Any changes to type or quantity of seed mix to be approved by the Engineer.

2.3 PLANTS

A. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying with requirements in ANSI Z60.1.

2.4 MULCHES

A. Ground or shredded bark: free from dyes to consist of wood chips derived from hardwood or softwood tree species available from municipalities or utility companies, or produced by chipping trees cut from on site. Size of individual wood chips should average 2-3" and should not exceed 4". Provide a mixture that is free of weed seed, harmful bacteria, or disease spores and substances toxic to plant growth. Mulch shall be derived from tree material, not from wood waste or by-products like sawdust, shredded palettes, or other debris. Mulch shall be natural in color and not dyed. It shall be of a uniform grade with no additives or any other treatment. Mulch with leaves, twigs, and/or debris shall not be acceptable. Mulch shall be applied to a uniform depth of 4" and shall be so distributed as to create a smooth, level cover over the exposed soil. A gap of approximately 2 inches should be left between the mulch and the trunk of the tree or shrub to avoid mounding above the trunk flare.

B. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

C. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.

2.5 PLANTING AND SEEDING MATERIALS

A. Accessories: Water - Clean, fresh and free of substances or matter which could inhibit vigorous growth of vegetation.

B. Stakes and Guys: Provide stakes and deadmen of sound new hardwood, treated softwood, or redwood, free of knot holes and other defects. Provide wire ties and guys of 2-strand, twisted, pliable galvanized iron wire, not lighter than 12 ga. with zinc-coated turnbuckles. Provide not less than 1/2 inch diameter rubber or plastic hose, cut to required lengths and of uniform color, material and size to protect tree trunks from damage by wires.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate the work to prepare planting areas with Section 32 91 13 – Topsoil. Topsoil shall be not be over compacted. A person weighing approximately 150 lbs walking on the soil should leave a 1”-2” depression by footprint. Topsoil over compacted shall be corrected by reverse tine tilling to full topsoil depth, cultipacked, fine graded until meeting this performance requirement.

B. Moisten prepared lawn areas before seeding if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

C. Before seeding, restore areas if eroded or otherwise disturbed after finish grading.

3.2 TREES

A. Excavation of Pits and Trenches for Trees: Excavate circular pits with sides sloped inward. Install and compact approved soil mix at bottom of pit as shown on the Contract Drawings leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately two times as wide as ball diameter.

B. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.

C. For balled and burlapped stock, make excavations at least half again as wide as the ball diameter and equal to the ball depth, plus following allowance for setting of ball on a layer of compacted backfill.

D. Allow for a three-inch (3)-inch thick setting layer of planting soil mixture.

E. For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width and depth.

F. Fill excavations for trees and shrubs with water and allow water to percolate out prior to planting.

G. Compost to be mixed with topsoil prior to backfill at a rate of 80% topsoil/20% compost (by weight).

H. Set balled and burlapped (B&B) stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with top of ball at same elevation as adjacent finished landscape grades. Remove burlap. When set, place additional backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.

I. Set container grown stock, as specified, for balled burlapped stock, except cut cans on two (2) sides with an approved can cutter; remove bottoms of wooden boxes after partial backfilling so as not to damage root balls.

J. Dish top of backfill to allow for mulching.

K. Mulch pits, trenches, and planted areas. Provide not less than following thickness of mulch, and work into top of backfill and finish level with adjacent finish grades.

L. Mulch shall be applied to a uniform depth of 4" and shall be so distributed as to create a smooth, level cover over the exposed soil. A gap of approximately 2 inches should be left between the mulch and the trunk of the tree or shrub to avoid mounding above the trunk flare.

M. Prune, thin out, and shape trees and container plants in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect or Engineer; do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any. Prune container plants to retain natural character.

N. Remove and replace excessively pruned or mis-formed stock resulting from improper pruning.

O. Guy and stake trees immediately after planting, as indicated.

3.3 SEEDING

A. Furnish and apply seed to the topsoil with a mechanical seeder at a rate as indicated on the seed label and/or contract document.

B. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

C. Hydro seeding is acceptable with written authorization by Owner's representative. Submit application materials and methods for approval.

D. Rake lawn seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

E. Drag or roll the surface of specialty seed areas to incorporate the seed into the top 1/4 inch to 1/2 inch of soil. A seed drill is acceptable.

F. Protect all seeded areas by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

G. Seeding shall not occur between June 15th and September 1st without prior written authorization by Owner's representative. Increased temporary irrigation may be required to establish lawn.

H. Satisfactory Seeding: After leaf-out in spring following construction 95% cover.

I. The Contractor shall be responsible for ensuring that seed mixture has successfully developed in to plant cover.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weigh, and seed component is deposited at not less than the specified seed-sowing rate.

B. Site Preparation - Proper site preparation is essential to ensure complete contact of the protection matting with the soil. Grade and shape the area of installation. Remove all rocks, roots, clods, vegetative, or other obstructions so that the installed blankets or mats will have direct contact with the soil. Prepare seedbed by loosening 2–3 inches of topsoil above final grade. Incorporate amendments, such as lime and fertilizer, into soil according to soil test and the seeding plan

C. Seed the area before installing blanket for erosion control and revegetation. Follow the manufacturer's instructions to ensure proper installation.

D. Erosion Control Blanket:

1. Anchoring - U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor ECB to the ground surface. Wire staples should be a minimum of 11 gauge. Metal stake pins should be 3/16 inch diameter steel with a 1.5 inch steel washer at the head of the pin. Wire staples and metal stakes should be driven flush to the soil surface.

2. All anchors should be 6–8 inches long and have sufficient ground penetration to resist pullout. Longer anchors might be required for loose soils.

3. Installation on Slopes - Begin at the top of the slope and anchor the blanket in a 6 inch deep by 6 inch wide trench. Backfill trench and tamp earth firmly. Unroll blanket downslope in the direction of the water flow. The edges of adjacent parallel rolls must be overlapped at least 3 inches and be stapled through the overlapped area at least every 2 feet. When blankets must be spliced, place uphill blanket end over downhill blanket (shingle style) with 6-inch overlap. Staple through overlapped area, approximately 12 inches apart. Lay blankets and mats loosely and maintain direct contact with the soil—do not stretch. Ensure good, consistent, direct soil contact.

4. ECBs must be stapled sufficiently to anchor the blanket and maintain contact with the soil. Staples must be placed down the center and staggered with the staples placed along

the edges. Steep slopes (1H:1V to 2H:1V) require at least two staples per square yard. Moderate slopes (2H:1V to 3H:1H) require 1-2 staples per square yard (1 staple 3 every feet on center). Gentle slopes require one staple per square yard.

5. Inspection and Maintenance - All blankets should be inspected periodically following installation. Inspect installation after significant rainstorms to check for erosion and undermining. Any failure should be repaired immediately. If washout or breakage occurs, reinstall the material after repairing the damage to the slope.

3.5 TREE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees and container plants according to standard horticultural practice. Prune trees to retain required height and spread. Do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

3.6 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants as directed.

B. Dig holes large enough to allow spreading of roots and backfill with planting soil. Compost to be mixed with topsoil prior to backfill at a rate of 80% topsoil/20% compost (by weight).

C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.7 PLANTING BED MULCHING

A. Mulch backfilled surfaces of planting beds and other areas indicated.

1. Apply 4-inch average thickness of mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

3.8 PLANT MAINTENANCE

A. Tree Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Ground Cover and Plant Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.

C. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. Maintain all lawns for 90 days from date of Substantial Completion.

1. Days from November 15 to April 15 do not count towards the 90-day requirement. Maintenance period will resume after April 15 as required by the contract period.

E. Temporary Irrigation

1. Provide temporary irrigation for all vegetated areas until final acceptance.
2. Contractor is responsible for the irrigation, labor, materials, and oversight, all inclusive until final acceptance of all plants.
3. Prior to germination, seed shall be irrigated at daily intervals at a rate of 3"to 4" per week to prolong soil moisture. If lawn installation is approved between June 1 and August 15, watering may be required twice per day.
4. Following germination, irrigate on alternate days to provide a minimum of 1" of saturation per watering session. Do not overwater to create water-logged conditions.
5. Reduce maintenance to 2-3 days per week, providing 1" to 2" of saturation per session for the remainder of the establishment period.
6. Irrigation may be modified as determined by the weather and soil moisture.
7. Irrigation shall be provided in the early morning or late afternoon to prevent evaporation.

3.9 INSPECTION AND ACCEPTANCE

A. When planting work is completed, including maintenance, the Owner will, upon request, make an inspection to determine acceptability.

B. When inspected planting work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by the Owner and found to be acceptable.

C. When the Owner decides that any area that has been planted fails for any reason to produce a satisfactory coverage and establish after a suitable period of time has elapsed, the Contractor shall remediate such areas in the same manner as specified in the contract until plants have been established. Any work to be corrected shall be at the Contractor's expense. The contract will not be accepted until plant establishment has been produced unless the work necessary to assure satisfactory establishment will be done under the provisions of an uncompleted work agreement.

END OF SECTION 32 93 00

SECTION 33 40 00 - STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 The General Conditions and Supplementary General Conditions apply to this section of the Specifications.

1.2 The work under this section shall conform to ALL relevant sections of the latest Form 819 – State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" including current supplements. In case of conflict between these Special Provisions and the CTDOT Standard Specifications, these Special provisions shall take precedence and shall govern.

1.3 WORK INCLUDED

Provide all labor, materials, tools, and equipment as and when required to perform the work specified herein or as shown on the plan, including but not limited to the following:

A. Storm drainage piping, fittings, and accessories.

B. Connection of drainage system to municipal sewers, if required.

C. Catch basins, junction chambers, and drainage swale.

D. Modular precast concrete manhole sections with tongue-and-groove joints, covers, anchorage, and accessories.

E. Drainage swale.

1.4 RELATED WORK SPECIFIED IN OTHER SECTIONS

Work shall be coordinated with the following sections:

1. Section 02 20 10 – Construction Staking and Test Pits
2. Section 03 41 40 – Precast Concrete Endwall
3. Section 31 20 00 – Earth Moving
4. Section 32 12 16 Asphalt Paving
5. Section 32 13 13 Concrete Paving and Curbing

1.5 SUBMITTALS

A. Product data for drainage pipe, trench drain, gasket material, and any of the miscellaneous drainage items.

B. Shop drawings for concrete storm drainage manholes, catch basins, area drains, and drywells, including frames, covers, grates, outlet control structure, and water quality unit.

1.6 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.7 REFERENCE STANDARDS

A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Drainage Pipe 2009 (Reapproved 2017).

B. AASHTO M 294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-MM (12- to 60-in.) Diameter 2017.

C. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe 2018a.

D. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric) 2018a.

E. ASTM A48/A48M - Standard Specification for Gray Iron Castings 2003 (Reapproved 2016).

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

G. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets 2012 (Reapproved 2017).

H. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric) 2011 (Reapproved 2017).

I. ASTM C478 - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections 2015a.

J. ASTM C478M - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections (Metric) 2015a.

K. ASTM C923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals (Metric) 2018.

L. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications 2014.

M. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Material 2014.

PART 2 - PRODUCTS

2.1 STORM PIPE MATERIALS

A. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class III and V with Wall type A and C; mesh reinforcement; inside nominal diameter as indicated on the drawings, bell and spigot end joints.

B. Reinforced Concrete Pipe Joint Device: ASTM C443 (ASTM C443M) rubber compression gasket joint.

C. Plastic Pipe: ASTM D3350, High Density Polyethylene (HDPE) corrugated wall pipe with integrally formed smooth liner; inside nominal diameter as indicated on drawings, meeting the requirements of AASHTO M 252, Type S, for diameters between 3 inches and 10 inches and AASHTO M 294, Type S, for diameters between 12 inches and 60 inches, soil-tight, bell and spigot joints with rubber gaskets, with pipe and fittings manufactured from virgin PE compounds with cell classification 3254420C.

2.2 PIPE ACCESSORIES

A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.

B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

C. Filter Fabric: Provide AASHTO M288 Class 2 Non-biodegradable, non-woven.

D. Detectable Tape: Brightly colored marking tape imprinted with large letters.

2.3 CATCH BASIN, CLEANOUT, AND AREA DRAIN COMPONENTS

A. Lids and Drain Covers: Cast iron, hinged to cast iron frame.
   1. Catch Basin: in accordance with ConnDOT Drainage Manual
      a. Type "C"
      b. Type "CL"
   2. Cleanout:
      a. Manufactured by ADS or approved equal
   3. Area Drain:
      a. Drain basin as manufactured by ADS or approved equal
      b. Inline drain as manufactured by ADS or approved equal

B. Catch Basins: Shall conform to CT DOT Form 819 Section 5.86.

2.4 MANHOLE

A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C478 (ASTM C478M), with resilient connectors complying with ASTM C923 (ASTM C923M).

B. Lid and Frame: ASTM A48/A48M Class 30B Cast iron construction, machined flat bearing surface, removable lockable lid, closed lid design; H-20 loading; sealing gasket; lid molded with identifying name.

C. Manhole Steps: Formed galvanized steel rungs; 3/4 inch diameter. Formed integral with manhole sections.

D. Strap Anchors: Bent steel shape, galvanized to ASTM A123/A123M Grade specified for applicable material category.

E. Shaft Construction: Concentric with concentric cone top section; lipped male/female dry joints; sleeved to receive pipe sections.

F. Shape: Cylindrical.

G. Clear Inside Dimensions: As indicated.

H. Design Depth: As indicated.

I. Clear Lid Opening: As indicated.

J. Pipe Entry: Provide openings as indicated.

K. Steps: As required by code.

L. Manholes: Shall conform to CT DOT Form 819 Section 5.86.

2.5 DRAINAGE SWALE

A. Products shall be as specified in the contract drawings and shall conform to CT DOT Form 819.

PART 3 - EXECUTION

3.1 TRENCHING

A. See Section 31 20 00 - Earth Moving for additional requirements.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.2 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.

1. Plastic Pipe: Also comply with ASTM D2321.

B. Lay pipe to slope gradients noted on utility drawings; with maximum variation from true slope of [1/8] inch in [10] feet.

C. Connect to foundation drainage system and utility/municipal sewer system.

D. Install continuous trace wire 6 inches above top of pipe.

3.3 INSTALLATION - CATCH BASINS AND CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place cast-in-place concrete base pad, with provision for storm sewer pipe end sections.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.4 MANHOLES

A. Place concrete base pad, trowel top surface level.

B. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

C. Cut and fit for pipe.

D. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.

E. Set cover frames and covers level without tipping, to correct elevations.

F. Coordinate with other sections of work to provide correct size, shape, and location.

3.5 DRAINAGE SWALE

A. Install drainage swale as specified on the plans or at the direction of the Engineer.

END OF SECTION 33 40 00

SECTION 35 41 20 – RIPRAP FILTER SPILLWAY

PART 1 - GENERAL

1.1 SUMMARY

A. The work under this Item shall include the furnishing and installation of a riprap filter spillway in the location as shown on the Contract Drawings, or as ordered by the Engineer.

PART 2 – PRODUCTS

1.1 RIPRAP FILTER SPILLWAY

A. The materials to be used for the work under this Item shall be those indicated on the Contract Drawings or ordered by the Engineer. Stone shall be No. 6 crushed stone conforming to Article M.01.02 of the Standard Specifications, and modified riprap conforming to Article M.12.02 of the Standard Specifications.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

A. The construction methods for the work under this item shall conform to the details shown on the Contract Drawings or as directed by the Engineer.

END OF SECTION 35 41 20

SECTION 35 43 61 – OUTLET PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The work under this Item shall include the furnishing and installation of every proposed outlet protection as shown on the Contract Drawings, or as ordered by the Engineer.

B. Outlet Protection Types:

- Type B Riprap Apron
- Type C Riprap Apron

PART 2 – PRODUCTS

A. The materials to be used for the work under this Item shall be those indicated on the Contract Drawings or ordered by the Engineer.

B. Granular fill shall conform to Article M.02.01 of the Standard Specifications.

C. Standard riprap shall conform to Article M.12.02 of the Standard Specification.

D. Geotextile shall conform to Article M.08.01-19 of the Standard Specification.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

A. The construction methods for the work under this item shall conform to the details shown on the Contract Drawings or as directed by the Engineer.

END OF SECTION 35 43 61

Town of Fairfield

Timothy J. Bishop MS, CEP
Director

Fairfield, Connecticut 06824
Conservation Commission
The Inland Wetlands Agency

Sullivan Independence Hall
725 Old Post Road
(203) 256-3071
FAX (203) 256-3123

November 3, 2023

Town Of Fairfield
c/o Megha Jain, Senior Civil Engineer
725 Old Post Road
Fairfield, CT 06824

Re: IWPA WP-23-151, Town of Fairfield, 150 Villa Avenue
Map 33 Parcel 75A
Flood mitigation within a regulated area

Dear Ms. Jain,

At the November 1, 2023 meeting of the Conservation Commission, acting as the Inland Wetlands Agency of the Town of Fairfield, the Agency received Inland Wetland Permit Application (IWPA) WP-23-151 for flood mitigation within a regulated area. The Agency voted to schedule a public hearing for IWPA WP-23-151 on **Wednesday, December 6, 2023 on or about 7:00 p.m.** in the **Fairfield Fire Training Center, 205 Richard White Way, Fairfield, CT**. Please note that you or a legal representative are required to be present at the hearing.

In order for staff to make timely preparations for the public hearing, submit the following on or before November 17, 2023:

1. Certified Mail Return Receipt Requested #10 unsealed envelopes for all abutting properties within 100-feet, all with separate listing of abutting owners filled out & cross-referenced by address and map & parcel number. **Use Town of Fairfield as Return addressee**.

2. Certified Mailing fee of $8.00/envelope.

Sincerely,

Sarah Neafsey
Wetlands Compliance Officer

STAFF REVIEW AND RECOMMENDATIONS
FOR
CONDITIONAL APPROVAL
FOR
INLAND WETLAND PERMIT APPLICATION NO. WP-23-151

APPLICANT:	Town of Fairfield Engineering Dept. 725 Old Post Road Fairfield, CT
PROPERTY LOCATION:	Vacant Parcel(s) 150 Villa Avenue, Fairfield, CT Map: 33 Block: 75A
PROPERTY OWNER:	Town of Fairfield
REGULATED ACTIVITY:	Assessment of existing drainage system and development of pipe realignment and daylighting alternatives for the outlets of the drainage systems.
PLANS AND PREPARER:	1. Drawing List prepared by SLR at a scale of 1" = 30' or As-Noted, dated October 13, 2023 and stamped received by Conservation Department October 19, 2023. Set includes "EX-1", "PR-1" and "PR-2".
SUPPORTING DOCUMENTS:	
Applicant:	1. Wetland Planting List for PR-1 Plan by SLR, not dated, received by the Conservation Department on October 19, 2023. 2. Wetland and Watercourse Delineation prepared by SLR, dated October 17, 2023, received by the Conservation Department on October 20, 2023.
Town:	3. Statement of Consistency – Engineering Department, dated October 19, 2023 and stamped received by the Conservation Department on October 20, 2023.

BACKGROUND

Located in the northeast section of Fairfield; north of Villa Avenue, west of Brooklawn Avenue (aka Route 58), south of Algonquin Road and east of Nichols Avenue, the currently vacant main parcel is located at and herein referred to as 150 Villa Avenue (the "Site"). For the purposes of this document, the Site consists of three additional parcels designated as 191 Algonquin Road, 130 Villa Avenue and 140 Villa Avenue is located in a residential neighborhood and current access is provided via a swing gate onto Villa Avenue. A majority of the Site is dominated by forest, forested/shrub inland wetlands, and a watercourse.

The parcel consists of 3.933-acres, is irregular in shape and generally flat and low-lying. A watercourse flows through the western portion and leaves the Site through a culvert under Villa Avenue.

I. REGULATED AREA

The entire Site is located within a Regulated Area and currently indicated on the Town official wetlands maps A-10 and B-10. Based on existing Town wetlands maps and those provided by the Applicant's (Town) consultants, SLR, the wetlands mapped during this investigation did not focus on the entire Site, rather they were mapped in the southern portion near the culvert beneath Villa Avenue. This specific location is generally consistent with the aforementioned existing Town maps.

The Site is located within the Rooster River watershed and includes a 100-foot Upland Review Area.

According to the FEMA Flood Map (FIRM) number 09001C0436G dated July 8, 2013, a majority of the Site is mapped by *Zone X, but having a 0.2% Annual Chance Flood Hazard - Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile.*

Based on information provided by the CTDEEP, the Site does not contain habitat defined as "critical" nor is the Site mapped by CTDEEP within the Natural Diversity Database Area, the nearest of which is mapped > 1-mile to the north.

It should also be noted that the Site contains two buried stormwater pipes which currently run parallel to each other and are located between Algonquin Road and Villa Avenue. The pipes measure 14x21-inches and 10x15-inches and are buried approximately 9-feet below grade. As the Agency may recall, the master plan is to create additional locations throughout Town to manage flooding related to the Rooster River. This proposal includes daylighting the two existing stormwater pipes beneath the property as well as diverting stormwater from Algonquin Road where frequent flooding occurs in order to increase detention times, improve water quality and create more vibrant wetland habitat for the Site.

BACKGROUND

Located in the northeast section of Fairfield; north of Villa Avenue, west of Brooklawn Avenue (aka Route 58), south of Algonquin Road and east of Nichols Avenue, the currently vacant main parcel is located at and herein referred to as 150 Villa Avenue (the "Site"). For the purposes of this document, the Site consists of three additional parcels designated as 191 Algonquin Road, 130 Villa Avenue and 140 Villa Avenue is located in a residential neighborhood and current access is provided via a swing gate onto Villa Avenue. A majority of the Site is dominated by forest, forested/shrub inland wetlands, and a watercourse.

The parcel consists of 3.933-acres, is irregular in shape and generally flat and low-lying. A watercourse flows through the western portion and leaves the Site through a culvert under Villa Avenue.

I. REGULATED AREA

The entire Site is located within a Regulated Area and currently indicated on the Town official wetlands maps A-10 and B-10. Based on existing Town wetlands maps and those provided by the Applicant's (Town) consultants, SLR, the wetlands mapped during this investigation did not focus on the entire Site, rather they were mapped in the southern portion near the culvert beneath Villa Avenue. This specific location is generally consistent with the aforementioned existing Town maps.

The Site is located within the Rooster River watershed and includes a 100-foot Upland Review Area.

According to the FEMA Flood Map (FIRM) number 09001C0436G dated July 8, 2013, a majority of the Site is mapped by *Zone X, but having a 0.2% Annual Chance Flood Hazard - Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile.*

Based on information provided by the CTDEEP, the Site does not contain habitat defined as "critical" nor is the Site mapped by CTDEEP within the Natural Diversity Database Area, the nearest of which is mapped > 1-mile to the north.

It should also be noted that the Site contains two buried stormwater pipes which currently run parallel to each other and are located between Algonquin Road and Villa Avenue. The pipes measure 14x21-inches and 10x15-inches and are buried approximately 9-feet below grade. As the Agency may recall, the master plan is to create additional locations throughout Town to manage flooding related to the Rooster River. This proposal includes daylighting the two existing stormwater pipes beneath the property as well as diverting stormwater from Algonquin Road where frequent flooding occurs in order to increase detention times, improve water quality and create more vibrant wetland habitat for the Site.

STAFF REVIEW AND RECOMMENDATIONS
FOR
CONDITIONAL APPROVAL
FOR
INLAND WETLAND PERMIT APPLICATION NO. WP-23-151

APPLICANT:	Town of Fairfield Engineering Dept. 725 Old Post Road Fairfield, CT
PROPERTY LOCATION:	Vacant Parcel(s) 150 Villa Avenue, Fairfield, CT Map: 33 Block: 75A
PROPERTY OWNER:	Town of Fairfield
REGULATED ACTIVITY:	Assessment of existing drainage system and development of pipe realignment and daylighting alternatives for the outlets of the drainage systems.
PLANS AND PREPARER:	1. Drawing List prepared by SLR at a scale of 1" = 30' or As-Noted, dated October 13, 2023 and stamped received by Conservation Department October 19, 2023. Set includes "EX-1", "PR-1" and "PR-2".
SUPPORTING DOCUMENTS:	
Applicant:	1. Wetland Planting List for PR-1 Plan by SLR, not dated, received by the Conservation Department on October 19, 2023.
	2. Wetland and Watercourse Delineation prepared by SLR, dated October 17, 2023, received by the Conservation Department on October 20, 2023.
Town:	3. Statement of Consistency – Engineering Department, dated October 19, 2023 and stamped received by the Conservation Department on October 20, 2023.

II. REGULATED ACTIVITY

The proposed regulated activities consist of some of the following:

- Site excavation and grading;
- Transportation of material and aggregate into and on-Site;
- Partial stormwater pipe removal;
- Stormwater pipe installation;
- Watercourse channel restoration;
- Slope stabilization, including rip-rap;
- Select sediment removal;
- Berm construction;
- Soil stockpiling and S&E control measures;
- Construction of wetlands;
- Wetland plantings, and;
- Placement of a Drainage Easement(s).

III. ANTICIPATED IMPACTS & DISCUSSION

Impacts to regulated wetland resources are anticipated as follows:

- Soil disturbances within and adjacent to wetlands/watercourses and within a Regulated Area can introduce additional material into the wetland and/or watercourses which could degrade the existing habitat. Proposed disturbances are anticipated to be both temporary and permanent in these locations, with the intent that those which are permanent will be mitigated through planned significant improvements to both water quality and habitat.

The proposed creation of a Rooster River detention area is expected to address several significant flooding concerns in the immediate vicinity of the Site, as well as multiple other downstream locations within the watershed itself. In general, this project being led by the Town's Engineering Department is understood to be one with the intent, supported by design, to manage stormwater in this area by increasing the capacity for detention. Simultaneously, anticipated environmental benefits to natural resources involve improvement of water quality, removal of invasive plant species, increased native biodiversity of aquatic and semi-aquatic plant species and creation of larger, higher quality inland wetlands and watercourse habitat that what currently exists on-Site.

While a separate plant list and quantity was provided for aquatic plants (0-6" water depth) on plan PR-1, it did not include the plant sizes. Additionally, the original list on PR-1 was illegible and no planting plan has been provided for review for any of the remaining areas on-Site that will be significantly disturbed during construction. These areas include locations outside of the area mapped by SLR and defined as Regulated Area and Upland Review Area. The presence of inland wetlands should also be verified by a

Professional Soil Scientist in these other on-Site locations with proposed ground disturbances, as the SLR report is not consistent with a previous recent delineation by Aleksandra Moch, dated March 6, 2021 and part of the previous IWP application number WP-22-158. These additional verification/delineations should occur prior to any ground disturbance occurs.

Sedimentation and erosion controls ("S&E") are required to be installed downgradient from all disturbance areas, specifically during construction of new wetland areas, in-water work and other significant earthwork activities. Details of S&E control measures should be provided for both land and in-water activities. A contingency plan shall also be provided to the Agency for review in the event that a significant precipitation event occurs during construction and in-water activities.

It is necessary to require a site monitor to oversee the project to ensure that the soil erosion and sediment controls are utilized and in good condition. The site monitor should be made a condition to the permit approval. Weekly reports and correspondence throughout the project phases should be provided to the Conservation Department for review and to be kept on-file. The Department recommends this task can be completed by qualified Engineering Department staff.

It is important to consider the time of year for in-water disturbances and stormwater pipe daylighting, as those should not be conducted during spring and early summer periods critical for aquatic species as well as reptile and amphibian breeding and migration in and around the on-Site habitats. Disruption at these times can have adverse impacts to these species including those related to temporary water quality degradation. The Department recommends that the activities should be planned and phased accordingly and that the phases of this project should be provided to the Agency for review and comment.

The Engineering Departments ("Engineering") have provided this Department with brief comments and indicated that the plans submitted for their review were consistent with their concern for the area and the activities proposed.

IV. RECOMMENDATIONS

The proposal may be approved with the following standard and specific conditions:

Respectfully Submitted,

Timothy J. Bishop, MS, CEP, WPIT
Director

Professional Soil Scientist in these other on-Site locations with proposed ground disturbances, as the SLR report is not consistent with a previous recent delineation by Aleksandra Moch, dated March 6, 2021 and part of the previous IWP application number WP-22-158. These additional verification/delineations should occur prior to any ground disturbance occurs.

Sedimentation and erosion controls ("S&E") are required to be installed downgradient from all disturbance areas, specifically during construction of new wetland areas, in-water work and other significant earthwork activities. Details of S&E control measures should be provided for both land and in-water activities. A contingency plan shall also be provided to the Agency for review in the event that a significant precipitation event occurs during construction and in-water activities.

It is necessary to require a site monitor to oversee the project to ensure that the soil erosion and sediment controls are utilized and in good condition. The site monitor should be made a condition to the permit approval. Weekly reports and correspondence throughout the project phases should be provided to the Conservation Department for review and to be kept on-file. The Department recommends this task can be completed by qualified Engineering Department staff.

It is important to consider the time of year for in-water disturbances and stormwater pipe daylighting, as those should not be conducted during spring and early summer periods critical for aquatic species as well as reptile and amphibian breeding and migration in and around the on-Site habitats. Disruption at these times can have adverse impacts to these species including those related to temporary water quality degradation. The Department recommends that the activities should be planned and phased accordingly and that the phases of this project should be provided to the Agency for review and comment.

The Engineering Departments ("Engineering") have provided this Department with brief comments and indicated that the plans submitted for their review were consistent with their concern for the area and the activities proposed.

IV. RECOMMENDATIONS

The proposal may be approved with the following standard and specific conditions:

Respectfully Submitted,

Timothy J. Bishop, MS, CEP, WPIT
Director

II. REGULATED ACTIVITY

The proposed regulated activities consist of some of the following:

- Site excavation and grading;
- Transportation of material and aggregate into and on-Site;
- Partial stormwater pipe removal;
- Stormwater pipe installation;
- Watercourse channel restoration;
- Slope stabilization, including rip-rap;
- Select sediment removal;
- Berm construction;
- Soil stockpiling and S&E control measures;
- Construction of wetlands;
- Wetland plantings, and;
- Placement of a Drainage Easement(s).

III. ANTICIPATED IMPACTS & DISCUSSION

Impacts to regulated wetland resources are anticipated as follows:

- Soil disturbances within and adjacent to wetlands/watercourses and within a Regulated Area can introduce additional material into the wetland and/or watercourses which could degrade the existing habitat. Proposed disturbances are anticipated to be both temporary and permanent in these locations, with the intent that those which are permanent will be mitigated through planned significant improvements to both water quality and habitat.

The proposed creation of a Rooster River detention area is expected to address several significant flooding concerns in the immediate vicinity of the Site, as well as multiple other downstream locations within the watershed itself. In general, this project being led by the Town's Engineering Department is understood to be one with the intent, supported by design, to manage stormwater in this area by increasing the capacity for detention. Simultaneously, anticipated environmental benefits to natural resources involve improvement of water quality, removal of invasive plant species, increased native biodiversity of aquatic and semi-aquatic plant species and creation of larger, higher quality inland wetlands and watercourse habitat that what currently exists on-Site.

While a separate plant list and quantity was provided for aquatic plants (0-6" water depth) on plan PR-1, it did not include the plant sizes. Additionally, the original list on PR-1 was illegible and no planting plan has been provided for review for any of the remaining areas on-Site that will be significantly disturbed during construction. These areas include locations outside of the area mapped by SLR and defined as Regulated Area and Upland Review Area. The presence of inland wetlands should also be verified by a

SPECIFIC CONDITIONS OF APPROVAL
PERMIT APPROVED BUT NOT ISSUED

NOTE: Failure to comply with these conditions within their appropriate time periods shall be sufficient cause to invalidate the permit. All * items must be complied with before site disturbance and before a foundation or a building permit application will be endorsed by the Conservation Department.

*1. Submit revised plans/documents indicating:

a) A revised planting plan on PR-1 that includes native shade trees, shrubs and herbaceous material to be located in disturbed areas other than those aquatic species already provided. The plan should specify location, quantity, species and size of the proposed plants and be indicated on the Site plan.

b) Plan details of sediment & erosion controls (including a contingency plan for storm events) for proposed disturbance in Regulated Areas, including in-water work.

2. A detailed plan of construction phases.

3. A Site Monitor will be required throughout the multi-phased construction process, specifically during ground disturbance work as it related to sediment and erosion control and construction fence around the construction site and adjacent to the wetlands area. The Engineering Department staff can be charged with this task, including providing monitoring reports to the Conservation Department.

4. A construction timeline that avoids significant land disturbance within and immediately adjacent to wetlands and watercourses between April and June.

5. Regulated Areas on-Site shall be verified and delineated by a Professional Soil Scientist where ground disturbances are proposed outside of the current wetland boundaries delineated by SLR in the application documents provided and prior to any disturbance occurs.

6. Permit duration shall be five years.

Note: All Standard Conditions must be complied with. Standard conditions *9, and *10 relates to performance bonding, and Standard condition *13 relates to environmental site monitoring