

PART 1 - GENERAL

1.1 General

- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38°C. Do not permit stationary loads on pavement until 24 hours after placement.

1.2 Scope

- .1 This Section shall cover the supply of labour, material and equipment required to provide asphaltic concrete for all the areas indicated on the site plan as being asphalt.

1.3 Layout

- .1 The Contractor shall be responsible for laying out all asphalt areas and confirming existing grades are as indicated on the Site Plan.

1.4 Fine Grading

- .1 Excavate and remove any material required in order to allow the placing of the gravel base at the proper elevation.

PART 2 - PRODUCTS

2.1 Materials

- .1 All materials to be according to PEI Department of Transportation, Infrastructure & Energy General Provisions and Contract Specifications for Highway Construction, Current Edition.
- .2 Prime coat, tack coat and asphalt cement shall be as per PEI Department of Transportation, Infrastructure & Energy Specifications, Division 500. Grade of asphalt shall be as recommended and accepted by the Department of Transportation and Infrastructure Renewal.
- .3 Asphaltic material: hot mixed, hot laid combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder in a suitable mixing plant. Asphaltic materials and aggregates shall meet the requirements of Section 603 of the Prince Edward Island Department of Transportation, Infrastructure & Energy Specification.
- .4 Composition of mixture: to grading and asphalt content

requirements in Table 4, Section 603 of the Prince Edward Island Department of Transportation, Infrastructure & Energy Specification. Base course asphalt shall be Mix Type A, thickness shown on drawings. Seal course asphalt shall be Mix Type B, thickness shown on drawings.

- .5 Class A granular Material in accordance with Section 401 of the Prince Edward Island Department of Transportation, Infrastructure & Energy Specification.
- .6 Select Borrow in accordance with Section 206 of the Prince Edward Island Department of Transportation, Infrastructure & Energy Specification.

PART 3 - EXECUTION

3.1 General

- .1 Asphalt pavement construction to be performed in spring of 2019 and shall be completed by June 15, 2019.

3.2 Subgrade Surface Preparation and Inspection

- .1 Verify grades of granular sub-base and base before placing asphalt.
- .2 Finish base surface to be within 10 mm of specified grade, but not uniformly high or low.

3.3 Asphalt Prime

- .1 Obtain Departmental Representatives approval of granular base surface before applying asphaltic primer.
- .2 Apply prime coat at a temperature of not less than 27 deg. C nor more than 45 deg. C.
- .3 Do not apply prime coat when air temperature is less than 10 deg. C or on a wet surface.
- .4 Permit prime coat to cure before placing asphalt paving mixtures.

3.4 Asphalt Concrete Paving

- .1 Supply and place select borrow to Prince Edward Island Department of Transportation, Infrastructure & Energy specifications as indicated on drawings, compacted to 100% standard proctor.
- .2 Supply and place the Class "A" granular material for the base course as indicated on drawings, compacted to 100% standard proctor.
- .3 Fine grade and compact the gravel base course in accordance with Section 208 and Section 209 "General Provisions and Contract Specifications for Highway Construction."
- .4 Place tack coat to requirements as outlined in Section 601 "General Provisions and Contract Specifications for Highway Construction."
- .5 Place prime coat to requirements as outlined in Section 602 "General Provisions and Contract Specifications for Highway Construction."
- .6 Supply and place hot mix asphaltic concrete base and seal materials to requirements as outlined in Section 603 of "General Provisions and Contract Specifications for Highway Construction."
- .7 The asphaltic concrete shall be finished to the following limits:
 - .1 Slope: Per finish contour lines and spot elevations +/- 25 mm.
 - .2 No irregularities greater than 3 mm in 3 m.
 - .3 Thickness: .3 +/- 6 mm for the base course and +/- 3 mm for the surface course.
 - .4 All asphalt shall be sloped such that water does not pond.
- .8 Repair areas showing checking, rippling or segregation as directed by Engineer.

3.5 Joints

- .1 Remove surplus material from surface of previously laid strip.
Do not deposit on surface of freshly laid strip.
- .2 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .3 For cold joints, cut back to full depth vertical face and tack face with hot asphalt.

- .4 For longitudinal joints, overlap previously laid strip with spreader by 25 to 50 mm.
- .5 Cold plane existing asphaltic concrete across the width of existing and new asphalt interface as directed on drawings.

3.6 Workmanship

- .1 The work shall be completed to the satisfaction of the Departmental Representative according to the above Specifications. Any areas which do not meet the Specification are to be cut out and replaced as directed.

3.7 Cleanup

- .1 Clean up and remove from the premises, rubbish and surplus materials resulting from the work of this Section.

3.8 Testing

- .1 Inspection and testing of asphalt pavement will be carried out by designated testing laboratory and will be the responsibility of the Departmental Representative.
- .2 Asphalt pavement shall meet or exceed 92% of the mean maximum theoretical relative density.

3.9 Protection

- .1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38° C. Do not permit stationary loads on pavement until 24 h after placement.

PART 1 - GENERAL

1.1 Work Included

- .1 This Section specifies requirements for excavation, supply and installing granular base and sandstone base, compacting, sidewalk and concrete curb construction and curing.

1.2 Reference Standards

- .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1-M90, and testing in accordance with CAN/CSA-A23.2-M90, except where specified otherwise.

1.3 Protection

- .1 Protect existing adjacent surfaces designated to remain. In event of damage, immediately replace or make repairs at no extra cost and to the approval of the Departmental Representative. Prior to the start of construction carry out a condition survey with the Departmental Representative and confirm the work to be carried out.

PART 2 - PRODUCTS

2.1 Granular Bedding

- .1 Granular bedding: Granular Class A as per Prince Edward Island Department of Transportation, Infrastructure and Energy requirements Division 401 or approved equal. Refer to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

2.2 Select Borrow

- .1 Select Borrow shall be as per Prince Edward Island Department of Transportation, Infrastructure and Energy requirements, Division 206. Refer to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

2.3 Formwork

- .1 Formwork:
 - .1 Formwork lumber: plywood and wood formwork materials conforming to CAN3-A23.1.
 - .2 Form release agents: chemically active release

agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing set of film of concrete in contact with form.

2.4 Reinforcing

- .1 Reinforcing:
 - .1 Welded steel wire mesh: to CSA G30.5-M. Provide in flat sheets only.
 - .2 Chairs and bolsters shall be of adequate strength to support reinforcing construction conditions.
 - .3 Dowels for joints: smooth, round mild steel bars to ASTM A307.
 - .4 Bars: to CSA G30.12-M, billet steel, grade 400, deformed.

2.5 Concrete

- .1 Portland cement: Type 10, to CAN3-A5, except high-early strength cement, if permitted, shall be Type 30.
- .2 Water: potable.
- .3 Aggregates: to CAN/CSA-A23.1-M90. Coarse aggregates to be normal density.
- .4 Air entraining mixture: to CAN3-A266.1-M.
- .5 Chemical admixtures: to CAN3-A266.2-M, Authority to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .6 Supplementary cementing materials and their use: to CAN3-A23.5-M.
- .7 Non-shrink grout: pre-mixed compound consisting of non-metallic aggregate, portland cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 30 MPa at 28 days.
- .8 Curing compound: to ASTM C309, Type 2.
- .9 Premoulded isolation joint fillers: to ASTM D1751, 1/2" thick, non-extruding, resilient, bituminous type.

2.6 Concrete Mix

- .1 Proportion normal density concrete in accordance with CAN/CSA-A23.1M90, Alternative 1, to give following properties: for concrete in exterior curbs and

sidewalks.

- .1 Use type 10 cement.
 - .2 Minimum compressive strength at 28 days: 32 MPa.
 - .3 Minimum cement content: CAN/CSA-A23.1-M90.
 - .4 Class of exposure: C-2.
 - .5 Nominal size of coarse aggregate: 20 mm.
 - .6 Slump at time and point of discharge: 80 mm \pm 30 mm.
 - .7 Air content: 5% to 8% maximum.
 - .8 Chemical admixtures: in accordance with CAN3-A266.4-M.
 - .9 Maximum water-cement ratio 0.45.
- .2 Do not change concrete mix without prior approval of Departmental Representative. Should change in material source be proposed, new mix design will be provided to be approved by Departmental Representative.

2.7 Curing Compound

- .1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-123.1 to exposed finished surfaces for at least 1 day after placing.
- .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.
- .3 Chloride resistant sealer : Water-based, penetrating sealing compound.

PART 3 - EXECUTION

3.1 Excavation

- .1 Excavate to the lines and grades shown on the drawings, topsoil and organics from removing under new sidewalk.
- .2 Compact surface of subgrade to 100% Standard Proctor Density.

3.2 Inspection of Existing Sub-grade Surface

- .1 Do not place sandstone material until finished subgrade is inspected and approved.

3.3 Select Borrow and Granular Base

- .1 Place select borrow to bring subgrade to grades required for granular base, compact to 100% Standard Proctor. Place granular base material to lines and widths and depths indicated and compact to 100%

Standard Proctor Density.

3.4 Forming

- .1 Concrete for curb to be shaped by forms of either wood or metal construction.
- .2 Concrete for sidewalk to be shaped by wood or metal forms.
- .3 Form vertical surfaces to full depth using forming material that will not deform under loading by plastic concrete.
- .4 Securely position forms to required lines and grades.
- .5 Horizontal and vertical alignment of the forms prior to placing concrete shall not vary more than 6 mm from the correct alignment and grade.
- .6 Coat forms with approved form release agent.
- .7 Obtain approval of forms before placing concrete.

3.5 Concrete Workmanship

- .1 Obtain Departmental Representative's approval before placing concrete. Place concrete in accordance with CAN/CSA-A23.1.
- .2 Any cost associated with testing will be the responsibility of the Departmental Representative.

3.6 Reinforcing

- .1 Accurately place isolation joint steel in positions required and hold firmly during placing, compacting and setting of concrete.

3.7 Curing Concrete

- .1 Apply curing compound to finished surfaces at a rate recommended by manufacturer, as soon as the water sheen has left the concrete surface.
- .2 Cure and protect concrete to CAN/CSA-A23.1-M90 unless otherwise directed. After concrete curing, apply chloride resistant sealer to all exterior concrete sidewalks and curbs as per the manufacturers recommendations.

3.8 Finishing Concrete

- .1 Trowel finish exposed surfaces to a smooth uniform finish, free of open texturing and exposed aggregate. Do not work more mortar to surface than required. Do not use neat cement as a drier to facilitate finishing. Broom finish concrete surface to provide evenly textured, non-skid surface.
- .2 Round edges, including edges of joints, with 1/4 inch radius edging tool.
- .3 Finish surfaces to prevent ponding.

3.9 Construction Joints

- .1 Control joints to be minimum of one quarter of section thickness.
- .2 Space curb control joints every 3 metres.
- .3 At the end of each concrete pour install isolation joint dowels to form cold pour construction joint.

3.10 Defective Work

- .1 Concrete is defective when:
 - .1 Concrete contains excessive honeycombing or embedded debris.
 - .2 The strength level fails to meet the criteria of CAN/CSA-A23 M-90.
 - .3 Concrete air content is less than the minimum specified.
 - .4 Defective concrete will be required to be replaced at the cost of the contractor.

3.11 Clean-up

- .1 Upon completion of work, remove debris and surplus excavated material, trim surfaces and leave work site clean and tidy

PART 1 - GENERAL

1.1 Work Included

- .1 This Section specifies requirements for furnishing all materials, labour, tools and equipment and performing all operations necessary to provide and apply pavement markings where shown on the Drawings and as specified.

1.2 References

- .1 CGSB-1.5-M91, Low Flash, Petroleum Spirits, Thinner.
- .2 CGSB-1-GP-71, Method of Testing Paints and Pigments.
- .3 CGSB-1-GP-74M, Paint, Traffic, Alkyd.
- .4 CGSB-1-GP-12C-68, Standard Paint Colours.

1.3 Samples

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative following material sample quantities at least 4 weeks prior to commencing work.
 - .1 Two 1 L samples of each type of paint.
 - .2 Sampling to CGSB 1-GP-71.
- .3 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.

PART 2 - PRODUCTS

2.1 Materials

- .1 Paint:
 - .1 To CGSB 1-GP-74M, alkyd traffic paint.
 - .2 Colour:
 - .1 Parking lines, cross walks and between lanes of traffic travelling same direction: to CGSB 1-GP-12, white, 513-301.
 - .2 Thinner: to CAN/CGSB-1.5.

PART 3 - EXECUTION

3.1 Condition of Surface

- .1 Pavement surface to be free from surface water, frost, ice, dust, oil, grease and other foreign material.

3.2 Application

- .1 Layout pavement markings as indicated on drawings.
- .2 Unless otherwise directed by Departmental Representative, apply paint only when air temperature is above 10°C and no rain is forecasted.
- .3 Apply traffic paint evenly at rate recommended by paint manufacturer.
- .4 Do not thin paint unless approved by Departmental Representative.
- .5 Paint lines to be 100 mm wide, of uniform colour and density with sharp edges.
- .6 Thoroughly clean distributor tank before refilling with paint of different colour.

3.3 Tolerance

- .1 Paint markings to be within plus or minus 12 mm of dimensions indicated.
- .2 Remove incorrect markings as directed.

3.4 Protection of Completed Work

- .1 Protect pavement markings until dry.

PART 1 - GENERAL

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| <u>1.1 PAYMENT</u> | .1 | Testing of topsoil: Departmental Representative will pay for cost of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services. |
| <u>1.2 REFERENCES</u> | .1 | Agriculture and Agri-Food Canada
.1 The Canadian System of Soil Classification, Third Edition, 1998. |
| | .2 | Canadian Council of Ministers of the Environment
.1 PN1340-2005, Guidelines for Compost Quality. |
| <u>1.3 DEFINITIONS</u> | .1 | Compost:
.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminants.
.4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A). |
| <u>1.4 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Quality control submittals :
.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements. |
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| 1.5 WASTE
MANAGEMENT AND
DISPOSAL | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |
| | .2 | Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative. |
| | .3 | Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard. |

PART 2 - PRODUCTS

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| 2.1 TOPSOIL | .1 | Topsoil for seeded areas and planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth. |
| | .1 | Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70 % sand, minimum 7 % clay, and contain 2 to 10 % organic matter by weight. |
| | .2 | Contain no toxic elements or growth inhibiting materials. |
| | .3 | Finished surface free from: |
| | .1 | Debris and stones over 50 mm diameter. |
| | .2 | Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume. |
| | .4 | Consistence: friable when moist. |

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| 2.2 SOIL AMENDMENTS | .1 | Fertilizer: |
| | .1 | Fertility: major soil nutrients present in following amounts: |
| | .2 | Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil. |
| | .3 | Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil. |
| | .4 | Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil. |
| | .5 | Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation. |
| | .6 | Ph value: 6.5 to 8.0. |
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2.2 SOIL AMENDMENTS .2
(Cont'd)

- Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle minimum size: 5 mm.
- .3 Sand: washed coarse silica sand, medium to course textured.
- .4 Organic matter: compost Category A in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .5 Limestone:
 - .1 Ground agricultural limestone.
 - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .6 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY .1
CONTROL

- .1 Advise Departmental Representative of sources of topsoil to be utilized with sufficient lead time for testing.
 - .2 Contractor is responsible for amendments to supply topsoil as specified.
 - .3 Soil testing by recognized testing facility for PH, P and K, and organic matter.
 - .4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.
 - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.
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PART 3 - EXECUTION

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| <u>3.1 STRIPPING OF
TOPSOIL</u> | .1 | Begin topsoil stripping of areas as indicated after area has been cleared of brush, weeds, and, grasses, and removed from site. |
| | .2 | Strip topsoil to depths as directed by Departmental Representative.
.1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application. |
| | .3 | Stockpile in locations as directed by Departmental Representative.
.1 Stockpile height not to exceed 2 m. |
| | .4 | Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill. |
| | .5 | Protect stockpiles from contamination and compaction. |
| <u>3.2 PREPARATION OF
EXISTING GRADE</u> | .1 | Verify that grades are correct.
.1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative. |
| | .2 | Grade soil, eliminating uneven areas and low spots, ensuring positive drainage. |
| | .3 | Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
.2 Remove debris which protrudes more than 75 mm above surface.
.3 Dispose of removed material off site. |
| | .4 | Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil. |
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| <u>3.3 PLACING AND
SPREADING OF
TOPSOIL/PLANTING
SOIL</u> | .1 | Place topsoil after Departmental
Representative has accepted subgrade. |
| | .2 | Spread topsoil in uniform layers not
exceeding 150 mm. |
| | .3 | Spread topsoil to following minimum depths
after settlement.
.1 100 mm for seeded areas.
.2 300 mm for flower beds.
.3 500 mm for shrub beds. |
| | .4 | Manually spread topsoil/planting soil around
trees, shrubs and obstacles. |
| <u>3.4 FINISH GRADING</u> | .1 | Grade to eliminate rough spots and low areas
and ensure positive drainage.
.1 Prepare loose friable bed by means of
cultivation and subsequent raking. |
| | .2 | Consolidate topsoil to required bulk density
using equipment approved by Departmental
Representative.
.1 Leave surfaces smooth, uniform and firm
against deep footprinting. |
| <u>3.5 ACCEPTANCE</u> | .1 | Departmental Representative will inspect and
test topsoil in place and determine acceptance
of material, depth of topsoil and finish
grading. |
| <u>3.6 SURPLUS
MATERIAL</u> | .1 | Dispose of materials except topsoil not
required off site. |
| <u>3.7 CLEANING</u> | .1 | Upon completion of installation, remove
surplus materials, rubbish, tools and
equipment barriers. |

PART 1 - GENERAL

<u>1.1 ADMINISTRATIVE REQUIREMENTS</u>	.1	Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.
	.2	Scheduling: <ul style="list-style-type: none">.1 Schedule seeding to coincide with preparation of soil surface..2 Schedule seeding when frost is not present in ground.
<u>1.2 REFERENCES</u>	.1	Canadian Landscape Standard, 1st Edition, 2016.
<u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u>	.1	Submit in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Product Data: <ul style="list-style-type: none">.1 Submit manufacturer's instructions, printed product literature and data sheets for seed, and fertilizer..2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.
	.3	Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
	.4	Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
<u>1.4 QUALITY ASSURANCE</u>	.1	Qualifications: <ul style="list-style-type: none">.1 Landscape Contractor: to be a Member in Good Standing of Landscape New Brunswick and Prince Edward Island..2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation..3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.5 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements:
 - .1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.
 - .2 Fertilizer must be dry.
- .3 Storage and Handling Requirements:
 - .1 Store fertilizer off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: manage packing waste in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

1.6 WARRANTY

- .1 For seeding, 12 months warranty period is extended to 1 full growing season.
- .2 End-of-warranty inspection will be conducted by Departmental Representative.

PART 2 - PRODUCTS

2.1 GRASS SEED

- .1 Canada "Certified" seed, "Canada No. 1 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".
 - .1 Grass seed mixture.
 - .1 Mixture composition:
 - .1 40% Kentucky Bluegrass.
 - .2 40% Creeping Red Fescue.
 - .3 20% Perennial Rye Grass.
 - .2 In packages individually labelled in accordance with "Seeds Regulations" and indicating name of supplier.

2.2 WATER

- .1 Free of impurities that would inhibit germination and growth.

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| <u>2.2 WATER
(Cont'd)</u> | .2 | Supplied by Departmental Representative at designated source. |
| | .3 | Water for required irrigation will be supplied via hose bib. |
| <u>2.3 FERTILIZER</u> | .1 | To Canada "Fertilizers Act" and Regulations. |
| | .2 | Complete synthetic fertilizer with guaranteed minimum analysis as specified. |

PART 3 - EXECUTION

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| <u>3.1 EXAMINATION</u> | .1 | Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for mechanical seeding installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied. |
| <u>3.2 INSTALLERS</u> | .1 | Use installers members in Good Standing of Landscape New Brunswick and Prince Edward Island. |
| <u>3.3 SOIL TESTING</u> | .1 | Designate 4 planting and 4 seeding locations for soil sampling for acceptance by Departmental Representative. |
| | .2 | Advise Departmental Representative if additional samples are necessary for the determining fertilization program for the whole site. |
| | .3 | Collect one 500 gram sample from each of the designated sample locations and submit to approved laboratory for fertility testing in accordance with PEI Department of Agriculture and Fisheries soil fertility testing guidelines. |
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- 3.3 SOIL TESTING (Cont'd) .4 Laboratory testing fees to be paid in accordance with SECTION 01 29 83 Payment Procedures for Testing Laboratory Services.
- 3.4 SEED BED PREPARATION
- .1 Do not perform work under adverse field conditions as determined by Departmental Representative.
 - .2 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .3 Verify that grades are correct. If discrepancies occur, notify Departmental Representative and commence work when instructed by Departmental Representative.
 - .4 Fine grade surface free of humps and hollows to smooth, even grade, surface draining naturally.
 - .5 Cultivate fine graded surface approved by Departmental Representative to 25 mm depth immediately prior to seeding.
- 3.5 SEED PLACEMENT
- .1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.
 - .2 For mechanical seeding:
 - .1 Mechanical landscape drill seeder ("Brillion" type or equivalent) which accurately places seed at specified depth and rate and rolls in single operation.
 - .2 Use equipment and method acceptable to Departmental Representative.
 - .3 For areas where mechanical seeding is impractical, manual seed as follows:
 - .1 Use manually operated drop seeder ("Cyclone" type or equivalent).
 - .2 Use manually operated, water ballast, landscaping type, smooth steel drum roller. Ballast as directed by Departmental Representative.
 - .3 Use equipment and method acceptable to Departmental Representative.
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- 3.5 SEED PLACEMENT (Cont'd)
- .4 On cultivated surfaces, sow seed uniformly at rate of:
 - .1 2 kg / 100 m² lawn grass mixture.
 - .5 Blend applications 150 mm into adjacent grass areas and previous applications to form uniform surfaces.
 - .6 Sow half of required amount of seed in one direction and remainder at right angles as applicable.
 - .7 Incorporate seed by light raking in cross directions.
 - .8 Consolidate mechanically seeded areas by rolling area if soil conditions warrant or if directed by Departmental Representative with equipment approved by Departmental Representative immediately after seeding.

- 3.6 CLEANING
- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean and reinstate areas affected by Work.
 - .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.

- 3.7 PROTECTION
- .1 Erect plastic snow fence around newly seeded areas sufficient to protect against deterioration due to pedestrian or other traffic.
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| 3.8 FERTILIZING
PROGRAM | .1 | Fertilize during establishment and warranty periods at frequency, rate and formulation as determined by soil test. |
| 3.9 MAINTENANCE
DURING
ESTABLISHMENT
PERIOD | .1 | Ensure maintenance is carried out under supervision of certified Landscape Maintenance Supervisor. |
| | .2 | Perform following operations from time of seed application until acceptance by Departmental Representative: <ul style="list-style-type: none"> .1 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts. .2 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance. .3 Cut grass to 50 mm whenever it reaches height of 70 mm. Remove clippings which will smother grass. .4 Fertilize seeded areas after first cutting in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well. .5 Control weeds by mechanical means utilizing acceptable integrated pest management practices. .6 Adjust protection barrier as necessary to protect against deterioration due to pedestrian or other traffic as needed. |
| 3.10 FINAL
ACCEPTANCE | .1 | Seeded areas will be accepted by Departmental Representative provided that: <ul style="list-style-type: none"> .1 Areas are uniformly established free of rutted, eroded, bare or dead spots and extent of weeds apparent in grass is acceptable. .2 Areas have been cut at least twice. .3 Areas have been fertilized. |
| | .2 | Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled. |
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- 3.11 MAINTENANCE .1 Perform following operations from time of
DURING WARRANTY acceptance until end of warranty period.
PERIOD .1 Water seeded area to maintain optimum
soil moisture level for continued growth of
grass. Control watering to prevent washouts.
.2 Repair and reseed dead or bare spots to
satisfaction of Departmental Representative.
.3 Cut grass to 50 mm whenever it reaches
height of 70 mm. Remove clippings which will
smother grass.
.4 Fertilize seeded areas in accordance
with fertilizing program. Spread half of
required amount of fertilizer in one direction
and remainder at right angles and water in
well.
.5 Control weeds by mechanical means
utilizing acceptable integrated pest
management practices.

PART 1 - GENERAL

<u>1.1 REFERENCES</u>	.1	Definitions: .1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.
	.2	Reference Standards: .1 Agriculture and Agri-Food Canada (AAFC). .1 Plant Hardiness Zones in Canada-2000. .2 Canadian Nursery Landscape Association (CNLA) .1 Canadian Standards for Nursery Stock-2006. .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS) .1 Material Safety Data Sheets (MSDS). .4 U.S. Environmental Protection Agency (EPA) / Office of Water .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices. .5 Canadian Landscape Standard, 1st Edition, 2016.
<u>1.2 ADMINISTRATIVE REQUIREMENTS</u>	.1	Scheduling: obtain approval from Departmental Representative of schedule 7 days in advance of shipment of plant material.
	.2	Schedule to include: .1 Quantity and type of plant material. .2 Shipping dates. .3 Arrival dates on site. .4 Planting Dates.
<u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u>	.1	Submit in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Product Data: .1 Submit manufacturer's instructions, printed product literature and data sheets for trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch and include product characteristics, performance criteria, physical size, finish and limitations.

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| 1.3 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd) | .2 | Product Data:(Cont'd)
.2 Submit 2 copies of WHMIS MSDS in
accordance with Section 01 35 29.06 - Health
and Safety Requirements 01 35 43 -
Environmental Procedures. |
| | .3 | Samples:
.1 Submit samples of mulch. |
| 1.4 QUALITY
ASSURANCE | .1 | Qualifications:
.1 Landscape Contractor: to be a Member in
Good Standing of Landscape New Brunswick and
Prince Edward Island.
.2 Landscape Planting Supervisor: Landscape
Industry Certified Technician with Softscape
Installation designation.
.3 Landscape Maintenance Supervisor:
Landscape Industry Certified Technician with
Ornamental Maintenance designation. |
| 1.5 DELIVERY,
STORAGE AND
HANDLING | .1 | Delivery and Acceptance Requirements: deliver
materials to site in original factory
packaging, labelled with manufacturer's name
and address.
.1 Protect plant material from frost,
excessive heat, wind and sun during delivery.
.2 Protect plant material from damage
during transportation:
.1 Delivery distance is less than 30
km and vehicle travels at speeds under 80
km/h, tie tarpaulins around plants or
over vehicle box.
.2 Delivery distance exceeds 30 km or
vehicle travels at speeds over 80 km/h,
use enclosed vehicle where practical.
.3 Protect foliage and root balls
using anti-desiccants and tarpaulins,
where use of enclosed vehicle is
impractical due to size and weight of
plant material. |
| | .2 | Storage and Handling Requirements:
.1 Immediately store and protect plant
material which will not be installed within 1
hours in accordance with supplier's written
recommendations and after arrival at site in
storage location approved by Departmental
Representative. |
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- 1.5 DELIVERY,
STORAGE AND
HANDLING
(Cont'd)
- .2 Storage and Handling Requirements:(Cont'd)
- .2 Protect stored plant material from frost, wind and sun and as follows:
- .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
- .2 For pots and containers, maintain moisture level in containers.
- .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.
- .3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

- 1.6 WARRANTY
- .1 For plant material over 75 mm caliper plant material as itemized on plant list the 12 months warranty period is extended to 24 months.
- .2 End-of-warranty inspection will be conducted by Departmental Representative.
- .3 Departmental Representative reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

PART 2 - PRODUCTS

- 2.1 PLANT MATERIAL
- .1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
- .1 Source of plant material: grown in Zone 6a in accordance with Plant Hardiness Zones in Canada.
- .2 Plant material must be planted in zone specified as appropriate for its species.
- .3 Plant material in location appropriate for its species.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

<u>2.1 PLANT MATERIAL</u> (Cont'd)	.3	Trees: with straight trunks, well and characteristically branched for species.
	.4	Trees larger than 200 mm in caliper: half root pruned during each of two successive growing seasons, the latter at least one growing season before arrival on site.
	.5	Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
<u>2.2 WATER</u>	.1	Free of impurities that would inhibit plant growth.
<u>2.3 STAKES</u>	.1	T-bar, steel, 40 x 40 x 5 x 2440 mm Wood, pointed one end, 38 x 38 x 2300 mm.
<u>2.4 WIRE TIGHTENER</u>	.1	Type 1: galvanized steel, stamped plate type, rod, triangular shape.
	.2	Type 2: turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm open length.
<u>2.5 GUYING WIRE</u>	.1	Type 1: steel, 3 mm wire.
	.2	Type 2: 1.5 mm diameter multi-wire steel cable.
	.3	Type 3: 3 mm diameter multi-wire steel cable.
<u>2.6 CLAMPS</u>	.1	U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.
	.2	Crimp type.
<u>2.7 ANCHORS</u>	.1	Wood:
	.1	Type 1: 38 x 38 x 460 mm.
	.2	Type 2: 38 x 67 x 600 mm.
	.2	Drive-in type.
	.1	Type 1: 13 mm diameter x 75 mm long, aluminum.

<u>2.7 ANCHORS</u> (Cont'd)	.2	(Cont'd)
	.2	Type 2: 18 mm diameter x 120 mm long, aluminum.
	.3	Screw-in type:
	.1	Type 1: 100 mm diameter steel disc.
<u>2.8 GUYING COLLAR</u>	.1	Tube: plastic, 13 mm diameter, nylon reinforced.
<u>2.9 TRUNK PROTECTION</u>	.1	Plastic: perforated spiralled strip.
<u>2.10 MULCH</u>	.1	Bark chip: varying in size from 25 to 50 mm in diameter, from bark of coniferous trees.
	.2	Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves.
	.3	Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees.
	.4	Synthetic or inorganic mulch.
<u>2.11 FERTILIZER</u>	.1	Synthetic commercial type as recommended by soil test report.
	.1	Ensure new root growth is in contact with mycorrhiza.
	.2	Use mycorrhiza as recommended by manufacturer's written recommendations.
<u>2.12 ANTI-DESICCANT</u>	.1	Wax-like emulsion.
<u>2.13 FLAGGING TAPE</u>	.1	Fluorescent, ORANGE colour.
<u>2.14 SOURCE QUALITY CONTROL</u>	.1	Obtain approval from Departmental Representative of plant material prior to planting.

2.14 SOURCE QUALITY .2
CONTROL
(Cont'd)

Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

PART 3 - EXECUTION

3.1 EXAMINATION .1

Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PRE-PLANTING
PREPARATION .1

Proceed only after receipt of written acceptability of plant material from Departmental Representative.

- .2 Remove damaged roots and branches from plant material.
- .3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.
- .4 Locate and protect utility lines.
- .5 Notify and acquire written acknowledgment from utility authorities before beginning excavation of planting pits for trees and shrubs.

3.3 EXCAVATION AND
PREPARATION OF
PLANTING BEDS .1

Preparation of planting beds in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.

- .2 For individual planting holes:
 - .1 Stake out location and obtain approval from Departmental Representative prior to excavating.
 - .2 Excavate to depth and width as indicated.

- 3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS
(Cont'd)
- .2 For individual planting holes:(Cont'd)
- .3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
- .4 Scarify sides of planting hole.
- .5 Remove water which enters excavations prior to planting. Notify Departmental Representative if water source is ground water.
- 3.4 PLANTING
- .1 For bare root stock, place 50 mm backfill soil in bottom of hole.
- .1 Plant trees and shrubs with roots placed straight out in hole.
- .2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.
- .1 Do not pull burlap or rope from under root ball.
- .3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Plant vertically in locations as indicated.
- .1 Orient plant material to give best appearance in relation to structure, roads and walks.
- .5 For trees and shrubs:
- .1 Backfill soil in 150 mm lifts.
- .1 Tamp each lift to eliminate air pockets.
- .2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.
- .3 After water has penetrated into soil, backfill to finish grade.
- .2 Form watering saucer as indicated.
- .6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.
- .7 Water plant material thoroughly.
- .8 After soil settlement has occurred, fill with soil to finish grade.
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- 3.5 TRUNK PROTECTION
- .1 Install trunk protection on deciduous trees as indicated.
 - .2 Install trunk protection before installation of tree supports.
- 3.6 TREE SUPPORTS
- .1 Install tree supports as indicated.
 - .2 Use single stake tree support for deciduous trees less than 3 m in height and evergreens less than 2 m in height.
 - .1 Place stake on prevailing wind side and 150 mm minimum from trunk.
 - .2 Drive stake 150 mm minimum into undisturbed soil beneath roots.
 - .1 Ensure stake is secure, vertical and unsplit.
 - .3 Install 150 mm long guying collar 1500 mm above grade.
 - .4 Thread Type 1 guying wire through guying collar tube.
 - .1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.
 - .3 Use 3 guy wires and anchors for deciduous trees greater than 3 m in height and evergreens greater than 2 m in height.
 - .1 Use Type 2 guying wire with clamps for trees less than 75 mm in diameter and Type 3 guying wire with clamps for trees greater than 75 mm in diameter.
 - .2 Use Type 1 anchors for trees less than 75 mm in diameter and Type 2 anchors for trees greater than 75 mm in diameter.
 - .3 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.
 - .4 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.
 - .5 Install anchors at equal intervals about tree and away from trunk so guy wire will form 45 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.
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| 3.6 TREE SUPPORTS
(Cont'd) | .3 | (Cont'd) |
| | .6 | Attach guy wire to anchors. Tension wire and secure by multi-wraps. |
| | .7 | Install wire tightener ensuring that guys are secure and leave room for slight movement of tree. |
| | .8 | Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by Departmental Representative. |
| | .9 | Install flagging tape to guys as indicated. |
| | .4 | After tree supports have been installed, remove broken branches with clean, sharp tools. |
| 3.7 MULCHING | .1 | Ensure soil settlement has been corrected prior to mulching. |
| | .2 | Spread mulch as indicated. |
| 3.8 MAINTENANCE
DURING
ESTABLISHMENT
PERIOD | .1 | Perform following maintenance operations from time of planting to acceptance by Departmental Representative. |
| | .1 | Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion. |
| | .1 | For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system. |
| | .2 | Remove weeds monthly. |
| | .3 | Replace or respread damaged, missing or disturbed mulch. |
| | .4 | For non-mulched areas, cultivate as required to keep top layer of soil friable. |
| | .5 | If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application. |
| | .6 | Remove dead or broken branches from plant material. |
| | .7 | Keep trunk protection and guy wires in proper repair and adjustment. |
| | .8 | Remove and replace dead plants and plants not in healthy growing condition. |
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3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD (Cont'd)	.1	(Cont'd)
	.1	(Cont'd)
	.8	(Cont'd)
		Make replacements in same manner as specified for original plantings.
3.9 MAINTENANCE DURING WARRANTY PERIOD	.1	From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
	.1	Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
	.2	Reform damaged watering saucers.
	.3	Remove weeds monthly.
	.4	Replace or respread damaged, missing or disturbed mulch.
	.5	For non-mulched areas, cultivate monthly to keep top layer of soil friable.
	.6	If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
	.7	Apply fertilizer in early spring as indicated by soil test.
	.8	Remove dead, broken or hazardous branches from plant material.
	.9	Keep trunk protection and tree supports in proper repair and adjustment.
	.10	Remove trunk protection, tree supports and level watering saucers at end of warranty period.
	.11	Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
	.12	Submit monthly written reports to Departmental Representative identifying:
	.1	Maintenance work carried out.
	.2	Development and condition of plant material.
	.3	Preventative or corrective measures required which are outside Contractor's responsibility.
3.10 CLEANING	.1	Leave Work area clean at end of each day.
	.2	Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

- 3.10 CLEANING
(Cont'd)
- .3 Waste Management: separate waste materials for reuse and recycling.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .2 Divert discarded burlap, wire and plastic plant containers materials from landfill to plastic recycling facility approved by Departmental Representative.
- .3 Dispose of unused fertilizer at official hazardous material collection site approved by Departmental Representative.
- .4 Dispose of unused anti-desiccant at official hazardous material collections site approved by Departmental Representative.
- .5 Divert unused wood and mulch materials from landfill to recycling composting facility approved by Departmental Representative.
- 3.11 CLOSEOUT
ACTIVITIES
- .1 Submit maintenance reports for trees, shrubs, and other plantings.